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**Valero Station**  
(Los Volcanes Rd. / Unser Blvd.)

**Traffic Impact Study**

December 29, 2010

DRAFT

**Presented to:**

City of Albuquerque  
Transportation Development Section

**Prepared for:**

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**Valero Commercial Development  
(Southwest Corner – Los Volcanes Rd. / Unser Blvd.)  
TRAFFIC IMPACT STUDY**

**STUDY PURPOSE**

This study is being conducted in conjunction with a request for approval of a gasoline station with a convenience market (20 fueling positions) facility such as the one shown in the Appendix (Page A-3) of this report. The purpose of this study is to identify the impact of the proposed Development on the adjacent transportation system, and to make recommendations to mitigate any significant adverse impact on the adjacent transportation system resulting from the implementation of the new development. This study is based on the assumption that the land uses and intensities implemented in the development of the proposed site development plan will be similar to those defined in the table on Page A-7 in the Appendix of this report. Should the developer propose a combination of land uses and / or densities that would significantly increase the overall traffic generation for the Valero Facility, an update to this study would be required reflecting the proposed new conditions.

**STUDY PROCEDURES**

The basic procedure followed for this traffic impact study is outlined as follows:

- ◆ Calculate the generated trips for this proposed retail commercial development consisting of a gas station with 20 fueling positions as specifically defined in the Trip Generation Table on Page A-7 in the Appendix of this report. The trips generated for the implementation year analysis (2012) will assume that 100% of the development has occurred.
- ◆ Calculate trip distribution for the newly generated trips by this development. The new commercial trips will be distributed based on year 2012 population data within a two (2) mile radius of the project as shown on Page A-8 in the Appendix of this report. Trips were truncated north of Interstate 40 due to another Valero station in the area.
- ◆ Determine Trip Assignments for the newly generated trips based on the results of the Trip Distribution Analysis and logical routing to and from the new site.
- ◆ Include the generated trips for the proposed Unser Crossing & Unser Town Center projects in the 2012 NO BUILD Volumes for this project.
- ◆ Conduct new traffic turning movement counts for the AM and PM Peak Hour periods for the intersections of Bluewater Rd. / Unser Blvd. and Los Volcanes Rd. / Unser Blvd.
- ◆ Calculate Historic Growth Rates for background traffic volumes based on historic AWDT Data obtained from the Mid-Region Council of Governments' Traffic Flow Maps or based on forecast AM and PM Peak Hour period link volumes extracted from the Mid-Region Council of Governments' regional transportation model (2030 data set).
- ◆ Calculate background traffic growth from the year of the most recent traffic counts to the implementation year for this analysis (2012).
- ◆ Add trips generated from the proposed Unser Crossing and Unser Town Center to the background traffic volumes. The trips from these previously approved developments will be included in the 2012 NO BUILD Volumes for this study.
- ◆ Add data from Trip Assignments Maps and Tables to the 2012 NO BUILD Volumes to obtain 2012 BUILD Volumes for this project.

- ◆ Provide signalized and / or unsignalized intersection analyses for the following intersections:

|   | INTERSECTION                    | TYPE CONTROL   | EXISTING ANALYSIS | NO BUILD ANALYSIS | BUILD ANALYSIS |
|---|---------------------------------|----------------|-------------------|-------------------|----------------|
| 1 | Los Volcanes Rd. / Unser Blvd.  | Traffic Signal | N/A               | 2012              | 2012           |
| 2 | Bluewater Rd. / Unser Blvd.     | Traffic Signal | N/A               | 2012              | 2012           |
| 3 | Central Ave. / Unser Blvd.      | Traffic Signal | N/A               | 2012              | 2012           |
| 4 | I-40 North Ramp / Unser Blvd.   | Traffic Signal | N/A               | 2012              | 2012           |
| 5 | I-40 South Ramp / Unser Blvd.   | Stop Sign      | N/A               | 2012              | 2012           |
| 6 | Saul Bell Rd / Unser Blvd       | Stop Sign      | N/A               | 2012              | 2012           |
| 7 | Los Volcanes Rd. / Driveway "A" | Stop Sign      | N/A               | N/A               | 2012           |
| 8 | Los Volcanes Rd. / Driveway "B" | Stop Sign      | N/A               | N/A               | 2012           |
| 9 | Driveway "C" / Unser Blvd.      | Stop Sign      | N/A               | N/A               | 2012           |

### **GENERAL AREA CHARACTERISTICS**

This project is located along the south side of Los Volcanes Rd. west of Unser Blvd. The surrounding area to the south, east, and west is primarily zoned for commercial and industrial park type of development. The Vicinity Map on Page A-1 of the Appendix shows the zoning of the surrounding properties in the area surrounding this site. The project is located in a mild to moderately active development area.

### **AREA STREET NETWORK**

Access to this new site will be primarily via Los Volcanes Rd. There are two proposed points into this development from Los Volcanes Rd. A secondary access point is a proposed right-in, right-out, unsignalized driveway onto Unser Blvd. Additionally, request is made to permit a northbound left-turn-in movement off of Unser Blvd. at Saul Bell Rd. to relieve potential northbound left turn traffic on Unser Blvd. at Los Volcanes Rd.

Los Volcanes Rd. is classified as a Collector Street on the Long Range Roadway System Map for the Albuquerque Metropolitan Planning Area. It is a paved urban roadway with curbs and gutters on both sides and no medians from Unser Blvd. to Coors Blvd. West of Unser Blvd., it is not classified.

Bluewater Rd. is classified as a Collector Street on the Long Range Roadway System Map for the Albuquerque Metropolitan Planning Area. It is a paved urban roadway with curbs and gutters on both sides and no medians from Unser Blvd. to Coors Blvd.

Unser Blvd. is classified as a Limited Access Principal Arterial roadway from Arenal Rd. to Montano Rd. on the Long Range Roadway System Map for the Albuquerque Metropolitan Planning Area. It is a four lane divided paved urban roadway with raised medians from Central Ave. to Montano Rd.

## **EXISTING TRAFFIC VOLUMES**

2009 Average Weekday Traffic Volumes (AWDT) for major streets in the site plan area are shown on Page A-6 in the Appendix.

Recent AM and PM Peak Hour turning movement counts were provided by the City of Albuquerque for the following intersections:

Additionally, AM and PM Peak Hour turning movement counts were obtained by field traffic counts taken recently for the following intersections:

*Los Volcanes Rd. / Unser Blvd. (October 6, 2010)*  
*Bluewater Ave. / Unser Blvd. (October 12, 2010)*  
*I-40 North Ramp / Unser Blvd. (October 13, 2010)*  
*I-40 South Ramp / Unser Blvd. (October 14, 2010)*

The counts are included near the end of the Appendix (Pages A-79 thru A-82).

## **EXISTING (2010) LEVELS OF SERVICE**

The Highway Capacity Manual defines Level of Service (LOS) for signalized intersections in terms of average controlled delay per vehicle as follows:

|       |               |                                     |
|-------|---------------|-------------------------------------|
| LOS A | 10.0" or less | Most Vehicles do not stop           |
| LOS B | 10.1 to 20.0" | Some Vehicles stop                  |
| LOS C | 20.1 to 35.0" | Significant number of vehicles stop |
| LOS D | 35.1 to 55.0" | Many vehicles stop.                 |
| LOS E | 55.1 to 80.0" | Limit of acceptable delay.          |
| LOS F | > 80.0"       | Unacceptable delay.                 |

Level of Service D is generally considered acceptable in urban areas and is the desirable base condition for analysis in a traffic study.

Existing operational levels-of-service calculations were not provided in this report since the 2012 NO BUILD analysis will approximate current conditions.

## **EXISTING TRANSIT SERVICE**

This area is currently served by Bus Route # 54 (Bridge / Westgate) which operates on weekdays from approximately 6:00 am until approximately 9:00 pm at 45 minute intervals and on Saturdays from approximately 6:00 am until approximately 9:00 pm at one hour intervals.

## **PROPOSED DEVELOPMENT**

The subject area of land discussed in this report is comprised of approximately 2 acres. See the conceptual site development plan on Page A-3 in the Appendix of this report to acquire more detailed information about the proposed development. This site plan is conceptual (preliminary) at this point in time and is subject to some changes as progress takes place in the design process. The changes are necessary to address concerns of the

City of Albuquerque and the neighborhood associations during the review process. The plan should, however, provide a reliable basis upon which to analyze the impact of the development on the adjacent transportation system and provide guidelines for mitigating the impact and establishing access criteria. The final approved plan should be substantially the same as the one contained in this report.

There are two (2) proposed primary access points (driveways) along Los Volcanes Rd. for the new site (See Site Map on Page A-2 of Appendix). One of the proposed driveways is intended to be a full access intersection accessing Los Volcanes Rd., while the other is a right-in, right-out only driveway. There is a proposed right-turn-in, right-turn-out only driveway on Unser Blvd. at the south end of the property and a proposed northbound left-turn-in off of Unser Blvd. at Saul Bell Rd. to access this project. Implementation of the partial access driveways on Unser Blvd. will be required to be approved by the Transportation Coordinating Committee (T.C.C.) at the Mid-Region Council of Governments (M.R.C.O.G.).

### TRIP GENERATION

Projected trips were calculated from data in the Institute of Transportation Engineers Trip Generation report (8<sup>th</sup> Edition, 2008). Trips for the development were determined based on land uses defined on the Preliminary Site Plan on Page A-3 in the Appendix of this report.

The resulting number of trips generated for the proposed development (100%) are summarized in the following table:

*Valero Station (Los Volcanes Rd. / Unser Blvd.)*  
*Trip Generation Data (ITE Trip Generation Manual - 8th Edition)*

| USE (ITE CODE)                                                | 24 HOUR<br>TWO-WAY<br>VOLUME | A. M.<br>PEAK<br>HOUR |      | P. M.<br>PEAK<br>HOUR |      |
|---------------------------------------------------------------|------------------------------|-----------------------|------|-----------------------|------|
|                                                               | GROSS                        | ENTER                 | EXIT | ENTER                 | EXIT |
| Units                                                         |                              |                       |      |                       |      |
| <i>Gasoline / Service Station w/ Convenience Market (945)</i> | 20.00                        | 3,256                 | 102  | 102                   | 134  |
| Fueling Positions                                             |                              |                       |      |                       |      |
|                                                               |                              |                       |      | 134                   |      |

#### ITE Trip Generation Equations:

Average Vehicle Trip Ends on a Weekday (24 HOUR TWO-WAY VOLUME)

$$T = \frac{162.78}{50\% \text{ Enter,}} (X) + \frac{0}{50\% \text{ Exit}}$$

Average Vehicle Trip Ends on a Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7am and 9am (A.M. PEAK HOUR)

$$T = \frac{10.16}{50\% \text{ Enter,}} (X) + \frac{0}{50\% \text{ Exit}}$$

Average Vehicle Trip Ends on a Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4pm and 6pm (P.M. PEAK HOUR)

$$T = \frac{13.38}{50\% \text{ Enter,}} (X) + \frac{0}{50\% \text{ Exit}}$$

The Implementation Year Analysis (2012) for this study assumed a development of 100% of the project to be implemented. See Appendix Page A-7 for more detailed information regarding trip generation rates.

An adjustment was made to the trip generation rates for PM Peak Hour Pass-by Trips for trips generated by this project.

## **TRIP DISTRIBUTION**

### **Primary and Diverted Linked Trips:**

Trips were distributed as follows:

#### ***Commercial Land Uses***

Primary and diverted linked trips for the commercial land use development were distributed proportionally to the 2012 projected population of Data Analysis Subzones within a three mile radius of the proposed development. Population data for the years 2004 and 2030 were taken from the 2030 Socioeconomic Forecasts by Data Analysis Subzones for the Mid-Region of New Mexico, S-03-01, Appendix B and Appendix C, supplied by the Mid-Region Council of Governments (MRCOG). Population data from the years 2004 and 2030 was interpolated linearly to obtain 2012 population data to utilize for this analysis. Population Subzones were grouped based on the most likely major street(s) or route(s) to the subject development. The trip distribution worksheets and associated map of data analysis subzones is shown in the Appendix. The commercial Trip Distribution map can be found in the Appendix on Page A-12.

## **TRIP ASSIGNMENTS**

Trip assignments for primary and diverted linked trips are first made on a percentage basis derived from data established in the trip distribution determination process and logical routing. Those percentages are then applied to the projected trips to determine individual traffic movements. Percentage trip assignments are shown on Pages A-13 thru A-14 in the Appendix of this report.

## **BACKGROUND TRAFFIC GROWTH**

Background traffic growth rates were considered for each individual approach to an intersection that was targeted for analysis based on data from the Mid-Region Council of Governments' Regional Transportation Model (2030 data set). Forecast AM and PM Peak Hour link volumes on major streets were extracted from the 2004 and 2030 volumes and utilized to establish a background traffic growth rate for projecting turning movements at the intersections to be analyzed in this project. Since there are existing traffic count volumes at the intersections analyzed in this project, the link volumes based on the recent traffic counts were utilized instead of the MRCOG regional model link volumes. Utilizing the growth rates established in such a manner should result in forecast turning movement volumes that are consistent with the Mid-Region Council of Governments forecast link volumes.

## **PROJECTED PEAK HOUR TURNING MOVEMENTS FOR 2012 BUILDOUT**

The calculated growth rates were applied to the most recent peak hour traffic counts (conducted for this study) and the trips from the approved *Unser Crossing* and *Unser Town Center* were added in to establish the 2012 background traffic volumes. To these volumes, the generated trips based on implementation of the proposed Valero Commercial Development Site Development Plan (100% development) were added to obtain BUILD volumes for the intersection analyses. See Appendix Pages A-20 thru A-40 for further information regarding 2012 turning movement counts.

## **INTERSECTION CAPACITY ANALYSIS**

Intersection capacity analyses were performed in accordance with the procedures for signalized and unsignalized intersections utilized in the Synchro (Version 7, Build 773) Transportation System analysis software program. Synchro software deviates from the 2000 Highway Capacity Manual methods in several areas, but the results obtained using Synchro software seem to be generally close to those based on the 2000 Highway Capacity Manual in most cases. For signalized intersections, the operational method of analysis was used for both the 2012 NO BUILD and BUILD conditions.

Capacity analyses were performed for the following traffic conditions.

2012 without development of the subject property (NO BUILD)

2012 with development as per the Conceptual Site Development Plan (BUILD)

Queuing analysis at signalized intersections is calculated based on Poisson's arrival method considering cycle length and peak hour volumes to achieve a 95% confidence level of maximum queue for the peak hour periods.

The results of the 2012 NO BUILD and 2012 BUILD capacity analyses are summarized in the following sections - *Results and Discussion of Intersection Capacity Analyses*.

## RESULTS OF SIGNALIZED INTERSECTION CAPACITY ANALYSES

### IMPLEMENTATION YEAR (2012)

#### 1. Los Volcanes Rd. / Unser Blvd. – A-41 thru A-48

The results of the implementation year analysis of the signalized intersection of Los Volcanes Rd. / Unser Blvd. are summarized in the following tables:

#### **Existing Geometry (Los Volcanes Rd. / Unser Blvd.)**

| Approach            | Left Turn Lanes | Thru/Lefts | Thru Lanes | Thru/Rights | Right Turn Lanes |
|---------------------|-----------------|------------|------------|-------------|------------------|
| EB Los Volcanes Rd. | 2               | 0          | 0          | 1           | 0                |
| WB Los Volcanes Rd. | 1               | 0          | 1          | 0           | 1                |
| NB Unser Blvd.      | 1               | 0          | 3          | 0           | 1                |
| SB Unser Blvd.      | 1               | 0          | 2          | 0           | 1                |

\* - Right Turn Lane by-passes the signal.

| Los Volcanes Rd. / Unser Blvd. | AM Peak Hour |          | PM Peak Hour |          |
|--------------------------------|--------------|----------|--------------|----------|
| 2012                           | NO BUILD     | BUILD    | NO BUILD     | BUILD    |
| Existing Geometry              | C – 31.5     | C – 32.2 | B – 17.2     | C – 20.5 |

**D - 39.7** - Bold Italicized Level-of-Service indicates that one or more individual turning movements is Level-of-Service E or worse.

The operation of the signalized intersection has been demonstrated to be acceptable for the projected 2012 BUILD conditions analyzed in this report. Therefore, there are no major recommendations to significantly modify the geometry or signal phasing / timing at the intersection. Minor extensions of auxiliary lanes may be recommended based on the following queuing analysis.

The following table summarizes the existing and calculated queuing at the signalized intersection:

## Queueing Analysis Summary Sheet

Project: Valero Commercial Development (Los Volcanes Rd / Unser Blvd)  
 Intersection: Los Volcanes Rd / Unser Blvd

| <b>2012</b>          |  |  |                   |      |        |                       |       |          |                    |      |        |
|----------------------|--|--|-------------------|------|--------|-----------------------|-------|----------|--------------------|------|--------|
| <b>Approach</b>      |  |  | <b>Left Turns</b> |      |        | <b>Thru Movements</b> |       |          | <b>Right Turns</b> |      |        |
| <b>Eastbound</b>     |  |  | # Lanes           | Vol. | Length | # Lanes               | Vol.  | Length   | # Lanes            | Vol. | Length |
| Existing Lane Length |  |  | 2                 | 172  | 100    | 1                     | 119   | Cont     | 0                  | 11   | 0      |
| AM NO BUILD Queue    |  |  | 2                 | 182  | 175    | 1                     | 127   | 200      | 0                  | 12   | 50     |
| AM BUILD Queue       |  |  | 2                 | 182  | 175    | 1                     | 143   | 225      | 0                  | 33   | 75     |
| Existing Lane Length |  |  | 2                 | 96   | 100    | 1                     | 16    | Cont     | 0                  | 16   | 0      |
| PM NO BUILD Queue    |  |  | 2                 | 113  | 125    | 1                     | 21    | 50       | 0                  | 19   | 50     |
| PM BUILD Queue       |  |  | 2                 | 126  | 125    | 1                     | 38    | 100      | 0                  | 46   | 100    |
| <b>Westbound</b>     |  |  | # Lanes           | Vol. | Length | # Lanes               | Vol.  | Length   | # Lanes            | Vol. | Length |
| Existing Lane Length |  |  | 1                 | 58   | 140    | 1                     | 29    | Cont     | 1                  | 136  | 140    |
| AM NO BUILD Queue    |  |  | 1                 | 94   | 150    | 1                     | 32    | 75       | 1                  | 152  | 225    |
| AM BUILD Queue       |  |  | 1                 | 94   | 150    | 1                     | 48    | 100      | 1                  | 152  | 225    |
| Existing Lane Length |  |  | 1                 | 68   | 140    | 1                     | 20    | Cont     | 1                  | 209  | 140    |
| PM NO BUILD Queue    |  |  | 1                 | 180  | 275    | 1                     | 23    | 75       | 1                  | 269  | 375    |
| PM BUILD Queue       |  |  | 1                 | 180  | 275    | 1                     | 40    | 100      | 1                  | 269  | 375    |
| <b>Northbound</b>    |  |  | # Lanes           | Vol. | Length | # Lanes               | Vol.  | Length   | # Lanes            | Vol. | Length |
| Existing Lane Length |  |  | 1                 | 23   | 575    | 3                     | 1,156 | Cont     | 1                  | 115  | 140    |
| AM NO BUILD Queue    |  |  | 1                 | 24   | 50     | 3                     | 1,253 | 575      | 1                  | 147  | 225    |
| AM BUILD Queue       |  |  | 1                 | 45   | 100    | 3                     | 1,253 | 575      | 1                  | 147  | 225    |
| Existing Lane Length |  |  | 1                 | 10   | 575    | 3                     | 1,045 | Cont     | 1                  | 83   | 140    |
| PM NO BUILD Queue    |  |  | 1                 | 11   | 50     | 3                     | 1,184 | 575      | 1                  | 137  | 225    |
| PM BUILD Queue       |  |  | 1                 | 36   | 75     | 3                     | 1,171 | 575      | 1                  | 137  | 225    |
| <b>Southbound</b>    |  |  | # Lanes           | Vol. | Length | # Lanes               | Vol.  | Length   | # Lanes            | Vol. | Length |
| Existing Lane Length |  |  | 1                 | 405  | 999    | 2                     | 1,511 | Cont     | 1                  | 208  | 140    |
| AM NO BUILD Queue    |  |  | 1                 | 462  | 550    | 2                     | 1,614 | >1,000 * | 1                  | 220  | 300    |
| AM BUILD Queue       |  |  | 1                 | 462  | 550    | 2                     | 1,614 | >1,000 * | 1                  | 220  | 300    |
| Existing Lane Length |  |  | 1                 | 141  | 999    | 2                     | 1,147 | Cont     | 1                  | 108  | 140    |
| PM NO BUILD Queue    |  |  | 1                 | 223  | 325    | 2                     | 1,167 | 775      | 1                  | 111  | 200    |
| PM BUILD Queue       |  |  | 1                 | 223  | 325    | 2                     | 1,163 | 775      | 1                  | 115  | 200    |

Cycle Length: AM 120 PM 130

NOTE: Queue lengths are in feet.

The intersection of Los Volcanes Rd. / Unser Blvd. will be significantly reconstructed with the Unser Towne Center project in the future. It is recommended for this project that the southbound right turn lane be extended to a total length of 300 feet plus transition.

## **2. Bluewater Rd. / Unser Blvd. – A-49 thru A-56**

The results of the implementation year analysis of the signalized intersection of Bluewater Rd. / Unser Blvd. are summarized in the following tables:

**Existing Geometry (Bluewater Rd. / Unser Blvd.)**

| Approach         | Left Turn Lanes | Thru/Lefts | Thru Lanes | Thru/Rights | Right Turn Lanes |
|------------------|-----------------|------------|------------|-------------|------------------|
| EB Bluewater Rd. | 1               | 0          | 0          | 1           | 0                |
| WB Bluewater Rd. | 1               | 0          | 1          | 0           | 1                |
| NB Unser Blvd.   | 1               | 0          | 2          | 0           | 1                |
| SB Unser Blvd.   | 1               | 0          | 2          | 0           | 1                |

\* - Right Turn Lane by-passes the signal.

| Bluewater Rd. / Unser Blvd. | AM Peak Hour    |              | PM Peak Hour    |              |
|-----------------------------|-----------------|--------------|-----------------|--------------|
| 2012                        | <u>NO BUILD</u> | <u>BUILD</u> | <u>NO BUILD</u> | <u>BUILD</u> |
| Existing Geometry           | C – 22.7        | C – 23.9     | B – 18.5        | B – 19.8     |

***D - 39.7*** - Bold Italicized Level-of-Service indicates that one or more individual turning movements is Level-of-Service E or worse.

The operation of the signalized intersection has been demonstrated to be acceptable for all projected conditions analyzed in this report. Therefore, there are no major recommendations to significantly modify the geometry or signal phasing / timing at the intersection. Minor extensions of auxiliary lanes may be recommended based on the following queuing analysis.

The following table summarizes the existing and calculated queuing at the signalized intersection:

## Queueing Analysis Summary Sheet

Project: Valero Commercial Development (Los Volcanes Rd / Unser Blvd)  
 Intersection: Bluewater Rd. / Unser Blvd

| 2012                 |         |            |        |                                  |                |        |         |             |        |  |
|----------------------|---------|------------|--------|----------------------------------|----------------|--------|---------|-------------|--------|--|
| Approach             |         | Left Turns |        |                                  | Thru Movements |        |         | Right Turns |        |  |
| Eastbound            | # Lanes | Vol.       | Length | # Lanes                          | Vol.           | Length | # Lanes | Vol.        | Length |  |
| Existing Lane Length | 1       | 177        | 85     | 1                                | 79             | Cont   | 0       | 81          | 0      |  |
| AM NO BUILD Queue    | 1       | 184        | 250    | 1                                | 81             | 150    | 0       | 84          | 150    |  |
| AM BUILD Queue       | 1       | 184        | 250    | 1                                | 81             | 150    | 0       | 84          | 150    |  |
| Existing Lane Length | 1       | 97         | 85     | 1                                | 53             | Cont   | 0       | 57          | 0      |  |
| PM NO BUILD Queue    | 1       | 109        | 175    | 1                                | 58             | 125    | 0       | 63          | 125    |  |
| PM BUILD Queue       | 1       | 109        | 175    | 1                                | 58             | 125    | 0       | 63          | 125    |  |
|                      |         |            |        |                                  |                |        |         |             |        |  |
| Westbound            | # Lanes | Vol.       | Length | # Lanes                          | Vol.           | Length | # Lanes | Vol.        | Length |  |
| Existing Lane Length | 1       | 45         | 130    | 1                                | 46             | Cont   | 1       | 52          | 130    |  |
| AM NO BUILD Queue    | 1       | 48         | 100    | 1                                | 49             | 100    | 1       | 55          | 100    |  |
| AM BUILD Queue       | 1       | 48         | 100    | 1                                | 49             | 100    | 1       | 70          | 125    |  |
| Existing Lane Length | 1       | 91         | 130    | 1                                | 89             | Cont   | 1       | 183         | 130    |  |
| PM NO BUILD Queue    | 1       | 96         | 175    | 1                                | 94             | 175    | 1       | 194         | 300    |  |
| PM BUILD Queue       | 1       | 96         | 175    | 1                                | 94             | 175    | 1       | 210         | 300    |  |
|                      |         |            |        |                                  |                |        |         |             |        |  |
| Northbound           | # Lanes | Vol.       | Length | # Lanes                          | Vol.           | Length | # Lanes | Vol.        | Length |  |
| Existing Lane Length | 1       | 70         | 130    | 2                                | 1,233          | Cont   | 1       | 89          | 250    |  |
| AM NO BUILD Queue    | 1       | 75         | 125    | 2                                | 1,359          | 825    | 1       | 94          | 150    |  |
| AM BUILD Queue       | 1       | 75         | 125    | 2                                | 1,408          | 850    | 1       | 94          | 150    |  |
| Existing Lane Length | 1       | 63         | 130    | 2                                | 865            | Cont   | 1       | 28          | 250    |  |
| PM NO BUILD Queue    | 1       | 70         | 125    | 2                                | 1,050          | 725    | 1       | 31          | 75     |  |
| PM BUILD Queue       | 1       | 70         | 125    | 2                                | 1,101          | 750    | 1       | 31          | 75     |  |
|                      |         |            |        |                                  |                |        |         |             |        |  |
| Southbound           | # Lanes | Vol.       | Length | # Lanes                          | Vol.           | Length | # Lanes | Vol.        | Length |  |
| Existing Lane Length | 1       | 148        | 160    | 2                                | 704            | Cont   | 1       | 97          | 170    |  |
| AM NO BUILD Queue    | 1       | 161        | 225    | 2                                | 809            | 525    | 1       | 106         | 175    |  |
| AM BUILD Queue       | 1       | 176        | 250    | 2                                | 858            | 575    | 1       | 106         | 175    |  |
| Existing Lane Length | 1       | 85         | 160    | 2                                | 1,100          | Cont   | 1       | 124         | 170    |  |
| PM NO BUILD Queue    | 1       | 87         | 150    | 2                                | 1,217          | 825    | 1       | 130         | 200    |  |
| PM BUILD Queue       | 1       | 103        | 175    | 2                                | 1,268          | 850    | 1       | 130         | 200    |  |
|                      |         |            |        |                                  |                |        |         |             |        |  |
| AM                   |         | PM         |        | NOTE: Queue lengths are in feet. |                |        |         |             |        |  |
| Cycle Length:        | 120     | 130        |        |                                  |                |        |         |             |        |  |

The eastbound left turn lane should be lengthened to a total length of 250 feet plus transition. However, there appears to be insufficient street width and right-of-way to accomplish the widening necessary to lengthen the left turn lane. Therefore, no recommendation is made. The southbound left turn lane should be lengthened to a total length of 250 feet plus transition.

### **3. Central Ave. / Unser Blvd.**

No analysis of Central Ave. / Unser Blvd. was required for this Traffic Impact Study. Only the trip assignments through the intersection were required to be report (See pages A-13 and A-14).

### **4. I-40 N. Ramp / Unser Blvd. – A-57 thru A-64**

The results of the implementation year analysis of the signalized intersection of I-40 N. Ramp / Unser Blvd. are summarized in the following tables:

**Existing Geometry (I-40 N. Ramp / Unser Blvd.)**

| Approach        | Left Turn Lanes | Thru/Lefts | Thru Lanes | Thru/Rights | Right Turn Lanes |
|-----------------|-----------------|------------|------------|-------------|------------------|
| EB I-40 N. Ramp | 0               | 0          | 0          | 0           | 0                |
| WB I-40 N. Ramp | 2               | 0          | 1          | 0           | 1*               |
| NB Unser Blvd.  | 1               | 0          | 2          | 0           | 0                |
| SB Unser Blvd.  | 0               | 0          | 3          | 0           | 1*               |

\* - WB and WB right turns are on free right turn ramps that by-pass the signal.

| I-40 N. Ramp / Unser Blvd. | AM Peak Hour    |              | PM Peak Hour    |              |
|----------------------------|-----------------|--------------|-----------------|--------------|
| 2012                       | <u>NO BUILD</u> | <u>BUILD</u> | <u>NO BUILD</u> | <u>BUILD</u> |
| Existing Geometry          | B – 12.4        | B – 12.4     | C – 25.4        | C-25.4       |

***D - 39.7*** - Bold Italicized Level-of-Service indicates that one or more individual turning movements is Level-of-Service E or worse.

The operation of the signalized intersection has been demonstrated to be acceptable for the projected 2012 BUILD conditions analyzed in this report. It should be noted that there are no trips generated by the Valero Station from or to this intersection. Since there is an existing Valero Station approximately one-half mile north of this intersection, it is assumed that traffic will gravitate to the other Valero Station north of I-40. Therefore, there are no major recommendations to significantly modify the geometry or signal phasing / timing at the intersection.

The following table summarizes the existing and calculated queuing at the signalized intersection:

## Queueing Analysis Summary Sheet

Project: Valero Commercial Development (Los Volcanes Rd / Unser Blvd)  
 Intersection: I-40 N. Ramp / Unser Blvd

| <b>2012</b>          |  |                   |      |        |                       |       |          |                    |      |        |  |
|----------------------|--|-------------------|------|--------|-----------------------|-------|----------|--------------------|------|--------|--|
| <b>Approach</b>      |  | <b>Left Turns</b> |      |        | <b>Thru Movements</b> |       |          | <b>Right Turns</b> |      |        |  |
| <b>Eastbound</b>     |  | # Lanes           | Vol. | Length | # Lanes               | Vol.  | Length   | # Lanes            | Vol. | Length |  |
| Existing Lane Length |  | 0                 | 0    | 0      | 0                     | 0     | Cont     | 0                  | 0    | 0      |  |
| AM NO BUILD Queue    |  | 0                 | 0    | 0      | 0                     | 0     | 0        | 0                  | 0    | 0      |  |
| AM BUILD Queue       |  | 0                 | 0    | 0      | 0                     | 0     | 0        | 0                  | 0    | 0      |  |
| Existing Lane Length |  | 0                 | 0    | 0      | 0                     | 0     | Cont     | 0                  | 0    | 0      |  |
| PM NO BUILD Queue    |  | 0                 | 0    | 0      | 0                     | 0     | 0        | 0                  | 0    | 0      |  |
| PM BUILD Queue       |  | 0                 | 0    | 0      | 0                     | 0     | 0        | 0                  | 0    | 0      |  |
| <b>Westbound</b>     |  | # Lanes           | Vol. | Length | # Lanes               | Vol.  | Length   | # Lanes            | Vol. | Length |  |
| Existing Lane Length |  | 2                 | 376  | 999    | 1                     | 0     | Cont     | 1                  | 0    | 999    |  |
| AM NO BUILD Queue    |  | 2                 | 391  | 300    | 1                     | 0     | 0        | 1                  | 0    | 0      |  |
| AM BUILD Queue       |  | 2                 | 391  | 300    | 1                     | 0     | 0        | 1                  | 0    | 0      |  |
| Existing Lane Length |  | 2                 | 921  | 999    | 1                     | 3     | Cont     | 1                  | 0    | 999    |  |
| PM NO BUILD Queue    |  | 2                 | 958  | 650    | 1                     | 3     | 25       | 1                  | 0    | 0      |  |
| PM BUILD Queue       |  | 2                 | 958  | 650    | 1                     | 3     | 25       | 1                  | 0    | 0      |  |
| <b>Northbound</b>    |  | # Lanes           | Vol. | Length | # Lanes               | Vol.  | Length   | # Lanes            | Vol. | Length |  |
| Existing Lane Length |  | 1                 | 33   | 300    | 2                     | 602   | Cont     | 0                  | 0    | 0      |  |
| AM NO BUILD Queue    |  | 1                 | 36   | 75     | 2                     | 659   | 450      | 0                  | 0    | 0      |  |
| AM BUILD Queue       |  | 1                 | 36   | 75     | 2                     | 659   | 450      | 0                  | 0    | 0      |  |
| Existing Lane Length |  | 1                 | 23   | 300    | 2                     | 915   | Cont     | 0                  | 0    | 0      |  |
| PM NO BUILD Queue    |  | 1                 | 26   | 75     | 2                     | 1,034 | 700      | 0                  | 0    | 0      |  |
| PM BUILD Queue       |  | 1                 | 26   | 75     | 2                     | 1,034 | 700      | 0                  | 0    | 0      |  |
| <b>Southbound</b>    |  | # Lanes           | Vol. | Length | # Lanes               | Vol.  | Length   | # Lanes            | Vol. | Length |  |
| Existing Lane Length |  | 0                 | 0    | 0      | 3                     | 2,222 | Cont     | 1                  | 0    | 999    |  |
| AM NO BUILD Queue    |  | 0                 | 0    | 0      | 3                     | 2,341 | >1,000 * | 1                  | 0    | 0      |  |
| AM BUILD Queue       |  | 0                 | 0    | 0      | 3                     | 2,341 | >1,000 * | 1                  | 0    | 0      |  |
| Existing Lane Length |  | 0                 | 0    | 0      | 3                     | 879   | Cont     | 1                  | 0    | 999    |  |
| PM NO BUILD Queue    |  | 0                 | 0    | 0      | 3                     | 1,049 | 525      | 1                  | 0    | 0      |  |
| PM BUILD Queue       |  | 0                 | 0    | 0      | 3                     | 1,049 | 525      | 1                  | 0    | 0      |  |

Cycle Length: AM  
120 PM  
130

**NOTE: Queue lengths are in feet.**

No recommendation is made for this intersection since no traffic is generated that contributes.

## **RESULTS OF UNSIGNALIZED INTERSECTION CAPACITY ANALYSES**

### **IMPLEMENTATION YEAR (2012)**

#### **5. I-40 S. Ramp / Unser Blvd - Pages A-65 thru A-68**

The results of the analysis of the unsignalized intersection of Saul Bell Rd. / Unser Blvd are summarized in the following table:

|                             | NO BUILD |         | BUILD   |       |
|-----------------------------|----------|---------|---------|-------|
| 2012                        | AM       | PM      | AM      | PM    |
| I-40 S. Ramp / Unser Blvd   |          |         |         |       |
| Minor Street (I-40 S. Ramp) |          |         |         |       |
| EB Left                     | F – Err  | F – 461 | F - Err | F 461 |
| EB Right                    | A - 0    | A - 0   | A - 0   | A - 0 |
| Major Street (Unser Blvd.)  |          |         |         |       |
| NB Left                     | N/A      | N/A     | N/A     | N/A   |

It was observed during the field traffic counts that no eastbound left turn movement was delayed more than about one minute. The calculated delay is so high during the AM Peak Hour that Synchro 7 reports it as "err." In actuality, it is much less delay. Since the proposed Valero Station is not anticipated to contribute new traffic to this intersection, no recommendation is made.

#### **6. Saul Bell Rd. / Unser Blvd - Pages A-69 thru A-72**

The results of the analysis of the unsignalized intersection of Saul Bell Rd. / Unser Blvd are summarized in the following table:

|                              | NO BUILD | BUILD  |        |        |
|------------------------------|----------|--------|--------|--------|
| 2012                         | AM       | PM     | AM     | PM     |
| Saul Bell Rd. / Unser Blvd   |          |        |        |        |
| Minor Street (Saul Bell Rd.) |          |        |        |        |
| EB Left                      | N/A      | N/A    | N/A    | N/A    |
| EB Right                     | B - 12   | B - 12 | B - 11 | B - 11 |
| Major Street (Unser Blvd.)   |          |        |        |        |
| NB Left                      | N/A      | C - 20 | N/A    | C - 17 |

The existing intersection of Saul Bell Rd. / Unser Blvd. is a right-in, right-out only unsignalized intersection located approximately midway between Los Volcanes Rd. and Bluewater Rd. This project is requesting approval of a northbound to westbound left turn movement from Unser Blvd. into Saul Bell Rd. in order to intercept some of the traffic entering the Valero project area, thus reducing the volume of northbound left turn traffic anticipated on Unser Blvd. at Los Volcanes Rd. There is an accompanying Valero Development Access Justification Study that addresses this request in more detail. The intersection of Saul Bell Rd. / Unser Blvd. is projected to operate at an acceptable level-of-service in the year 2012 as a right-in, right-out, left-in unsignalized intersection.

### **7. Los Volcanes Rd. / Driveway "A" - Pages A-73 thru A-74**

Driveway "A" is an existing full access driveway which will be shared with the property to the west. The results of the analysis of the unsignalized intersection of Los Volcanes Rd. / Driveway "A" are summarized in the following table:

|                                        | BUILD  |        |
|----------------------------------------|--------|--------|
|                                        | AM     | PM     |
| 2012                                   |        |        |
| <b>Los Volcanes Rd. / Driveway "A"</b> |        |        |
| Minor Street (Driveway "A")            |        |        |
| NB Left                                | C - 16 | B - 12 |
| NB Right                               | C - 16 | B - 12 |
| Major Street (Los Volcanes Rd.)        |        |        |
| WB Left                                | A - 2  | A - 2  |

The operation of the unsignalized Driveway "A" has been demonstrated to be acceptable for the projected BUILD conditions analyzed in this report.

### **8. Los Volcanes Rd. / Driveway "B" - Pages A-75 thru A-76**

The results of the analysis of the unsignalized intersection of Los Volcanes Rd. / Driveway "B" are summarized in the following table:

|                                        | BUILD  |        |
|----------------------------------------|--------|--------|
|                                        | AM     | PM     |
| 2012                                   |        |        |
| <b>Los Volcanes Rd. / Driveway "B"</b> |        |        |
| Minor Street (Driveway "B")            |        |        |
| NB Right                               | B - 11 | A - 10 |
| Major Street (Los Volcanes Rd.)        |        |        |
| WB Left                                | N/A    | N/A    |

The operation of the unsignalized Driveway "B" has been demonstrated to be acceptable for the projected PM BUILD conditions analyzed in this report..

### **9. Driveway "C" / Unser Blvd. - Pages A-77 thru A-78**

The results of the analysis of the unsignalized intersection of Driveway "C" / Unser Blvd. are summarized in the following table:

|                                   | BUILD  |        |
|-----------------------------------|--------|--------|
|                                   | AM     | PM     |
| 2012                              |        |        |
| <b>Driveway "C" / Unser Blvd.</b> |        |        |
| Minor Street (Driveway "C")       |        |        |
| EB Left                           | N/A    | N/A    |
| EB Right                          | B - 12 | B - 11 |
| Major Street (Unser Blvd.)        |        |        |
| NB Left                           | N/A    | N/A    |

The analysis of the unsignalized intersection of Driveway "C" / Unser Blvd. will operate at acceptable levels-of-service for the forecast 2012 BUILD Conditions as an unsignalized right-turn-in, right-turn-out only intersection.

Driveway "C" should be constructed with a southbound right turn deceleration lane on Unser Blvd. The length of the southbound right turn deceleration lane is required to be 370 feet long plus transition based on Table 18.K-1 (Deceleration and Acceleration Lengths) from the New Mexico Department's *State Access Management Manual*, current edition. This study recommends that the decal lane be constructed to the maximum length possible up to the 370 feet plus transition.

See Pages A-86 thru A-88 for Determination of Warrants for Deceleration Lanes worksheets.

Driveway "C" will require approval from the Transportation Coordinating Committee (T.C.C.) at the Mid-Region Council of Governments.

It should be noted that Levels of Service (LOS) for unsignalized intersections cannot be compared directly with Levels of Service for signalized intersections. LOS for unsignalized intersections is based on reserve capacity, which is converted to generalized levels of delay; LOS for signalized intersections is based on actual delay in seconds..

#### **LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS**

| <b><u>Average Delay</u></b><br><b><u>(secs)</u></b> | <b><u>Level-of-Service</u></b> |
|-----------------------------------------------------|--------------------------------|
| ≤ 10                                                | A                              |
| > 10 and ≤ 15                                       | B                              |
| > 15 and ≤ 25                                       | C                              |
| > 25 and ≤ 35                                       | D                              |
| > 35 and ≤ 50                                       | E                              |
| > 50                                                | F                              |

Generally speaking, a Level-of-Service D or better is an acceptable parameter for design purposes.

#### **CONCLUSIONS**

The proposed site plan for the Valero Station at the southwest corner of Los Volcanes Rd. / Unser Blvd. will present minor impact to the adjacent transportation system. However, the impact to the adjacent transportation system can be mitigated by implementation of the following recommendations:

## **RECOMMENDATIONS**

### **FROM IMPLEMENTATION YEAR (2012) ANALYSIS**

#### **Offsite Recommendations:**

**Bluewater Rd. / Unser Blvd.** – Lengthen the southbound left turn lane to a total length of 250 feet plus transition.

**Los Volcanes Rd. / Unser Blvd.** – Lengthen the southbound right turn lane to a total length of 300 feet plus transition.

#### **Access Recommendations:**

Recommended access is via two proposed new driveways plus modification of two existing driveways (intersections). One full access driveway is an existing driveway on Los Volcanes (Driveway "A") at the west end of this project. It will remain a full access unsignalized shared driveway with the neighboring property to the west. One right-turn-in, right-turn-out driveway is proposed on Los Volcanes Rd. (Driveway "B") east of Driveway "A". The existing intersection of Saul Bell Rd. / Unser Blvd. is currently a right-in, right-out only intersection. Request is made to approve a northbound left-in at this intersection to accept northbound traffic on Unser Blvd. turning into the area. This will relieve some of the northbound left turn traffic on Unser Blvd. at Los Volcanes Rd. Finally, a new right-in, right-out only unsignalized driveway on the west side of Unser Blvd. approximately midway between Los Volcanes Rd. and Saul Bell Rd. is proposed (Driveway "C"). See Preliminary Site Plan on Page A-3 in the Appendix of this report for further detail.

Driveway "A" is an existing a full access unsignalized driveway on Los Volcanes Rd. constructed on the property to the west. It is located approximately 360 feet west of Unser Blvd. (centerline to centerline).

Driveway "B" is recommended to be a right-in, right-out only unsignalized driveway on Los Volcanes Rd. located approximately 200 feet west of Unser Blvd. (centerline to centerline). Driveway "B" should be designed with one exiting lane (for right turns only) and one entering lane.

Driveway "C" is recommended to be a right-turn-in, right-turn-out only unsignalized driveway located approximately midway between Los Volcanes Rd. and Saul Bell Rd. on the west side of Unser Blvd. Driveway "C" should be constructed with one exiting lane (for right turns only) and one entering lane. A southbound right turn deceleration lane is required on Unser Blvd. at Driveway "C". The southbound right turn deceleration lane should be constructed to a length of 370 feet plus transition (12.5:1 taper) or as long as physically possible if the 370 feet length cannot be achieved. Driveway "C" must be approved by both the Transportation Coordinating Committee (T.C.C.) at the Mid-Region Council of Governments.

All design and construction of the project shall provide for adequate sight distances and driveways at existing and proposed intersections and driveways.

## Appendix

|                                                                          |                |
|--------------------------------------------------------------------------|----------------|
| <b><u>SITE INFORMATION</u></b>                                           |                |
| Vicinity Map                                                             | A - 1          |
| Aerial Photo of Project Area                                             | A - 2          |
| Conceptual Site Development Plan                                         | A - 3          |
| Long Range Major Street Plan for the Albuquerque Urban Area              | A - 4          |
| Portion of LRMSD for Project Area                                        | A - 5          |
| 2009 AWDT Traffic Flow Maps                                              | A-6 thru A-6a  |
| <b><u>TRIP GENERATION</u></b>                                            |                |
| Trip Generation Worksheet                                                | A-7 thru A-7a  |
| <b><u>TRIP DISTRIBUTION</u></b>                                          |                |
| Date Analysis Subzone Map for Commercial Trip Distribution               | A-8            |
| Trip Distribution Worksheets (Commercial)                                | A-9 thru A-11  |
| Trip Distribution Map (Commercial)                                       | A-12           |
| Trip Assignments (Commercial Trips Entering)                             | A-13           |
| Trip Assignments (Commercial Trips Exiting)                              | A-14           |
| Pass-by Trip Assignments (Entering and Exiting)                          | A-15           |
| <b><u>HISTORIC BACKGROUND TRAFFIC GROWTH RATE</u></b>                    |                |
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| Individual Intersection Turning Movement Counts Tables                   | A-22 thru A-40 |
| <b><u>SIGNALIZED INTERSECTION ANALYSES</u></b>                           |                |
| <b><u>IMPLEMENTATION YEAR (2012)</u></b>                                 |                |
| 1 - Signalized Intersection Analyses (Los Volcanes Rd. / Unser Blvd.)    | A-41 thru a-48 |
| 2 - Signalized Intersection Analyses (Bluewater Rd. / Unser Blvd.)       | A-49 thru A-56 |
| 3 - Signalized Intersection Analyses (Central Ave. / Unser Blvd.)        | Not Required   |
| 4 - Signalized Intersection Analyses (I-40 N. Ramp / Unser Blvd.)        | A-57 thru A-64 |
| <b><u>UNSIGNALIZED INTERSECTION ANALYSES</u></b>                         |                |
| <b><u>IMPLEMENTATION YEAR (2012)</u></b>                                 |                |
| 5 - Unsignalized Intersection Analysis (I-40 South Ramp / Unser Blvd.)   | A-65 thru A-68 |
| 6 - Unsignalized Intersection Analysis (Saul Beil Rd. / Unser Blvd.)     | A-69 thru A-72 |
| 7 - Unsignalized Intersection Analysis (Los Volcanes Rd. / Driveway "A") | A-73 thru A-74 |
| 8 - Unsignalized Intersection Analysis (Los Volcanes Rd. / Driveway "B") | A-75 thru A-76 |
| 9 - Unsignalized Intersection Analysis (Driveway "C" / Unser Blvd.)      | A-77 thru A-78 |
| <b><u>Determination of Warrants for Deceleration Lanes</u></b>           |                |
| Traffic Count and Intersection Geometry Data                             | A-79 thru A-84 |
| Auxiliary Lane Warrant Worksheets                                        | A-85 thru A-87 |
| Table 18.K-1: Deceleration and Acceleration Lengths (feet)               | A-88           |

## **APPENDIX**



v.cabq.gov/gis

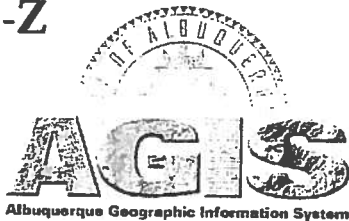
For more current information and more details visit: <http://www.cabq.gov/gis>

Zone Atlas Page:

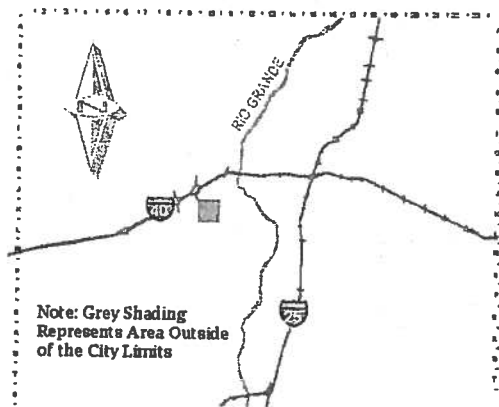
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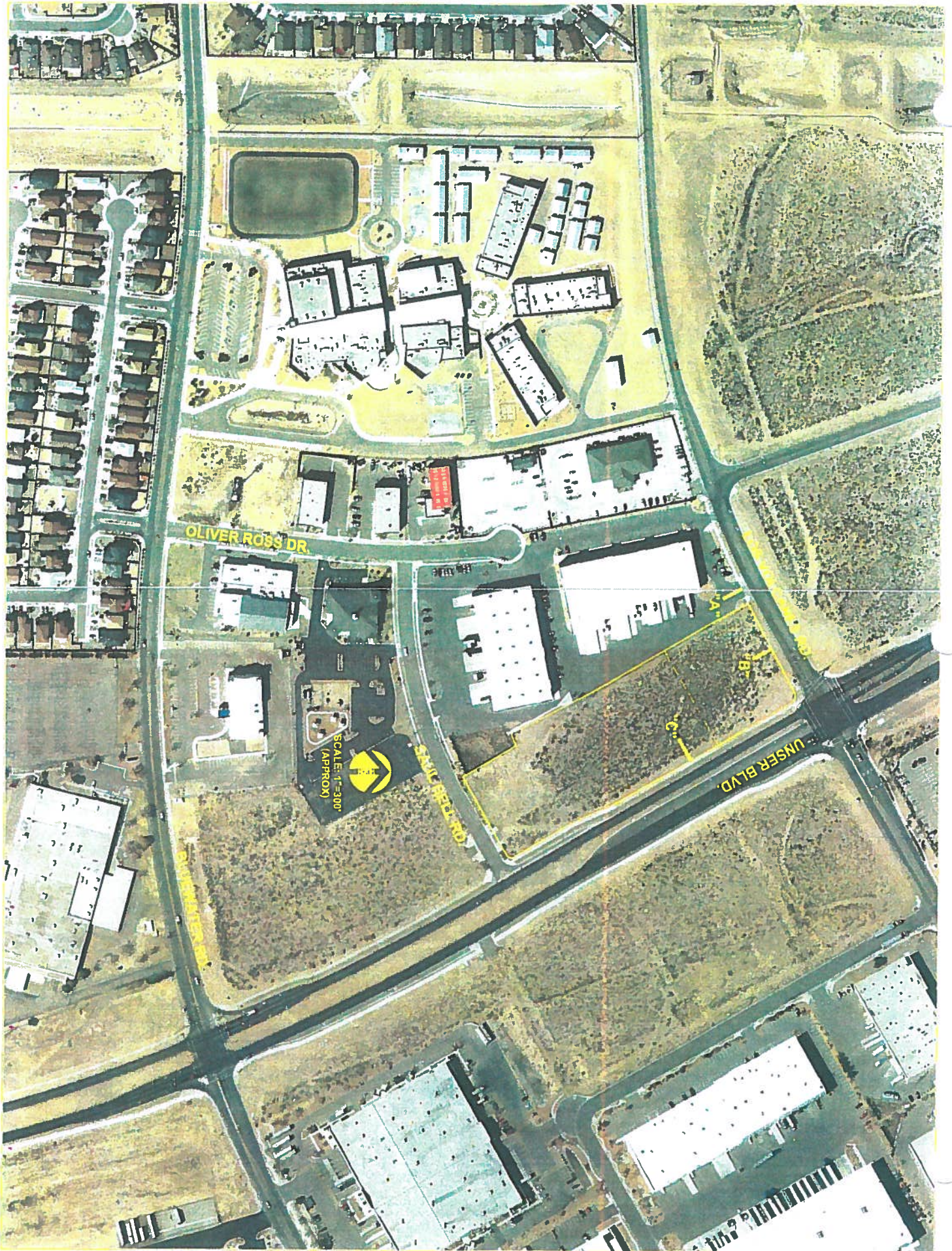
Selected Symbols

- |                      |                 |
|----------------------|-----------------|
| SECTOR PLANS         | Escarpment      |
| Design Overlay Zones | 2 Mile Airport  |
| City Historic Zones  | Airport Noise C |
| H-1 Buffer Zone      | Wall Overlay Z  |
| Petroglyph Mon.      |                 |

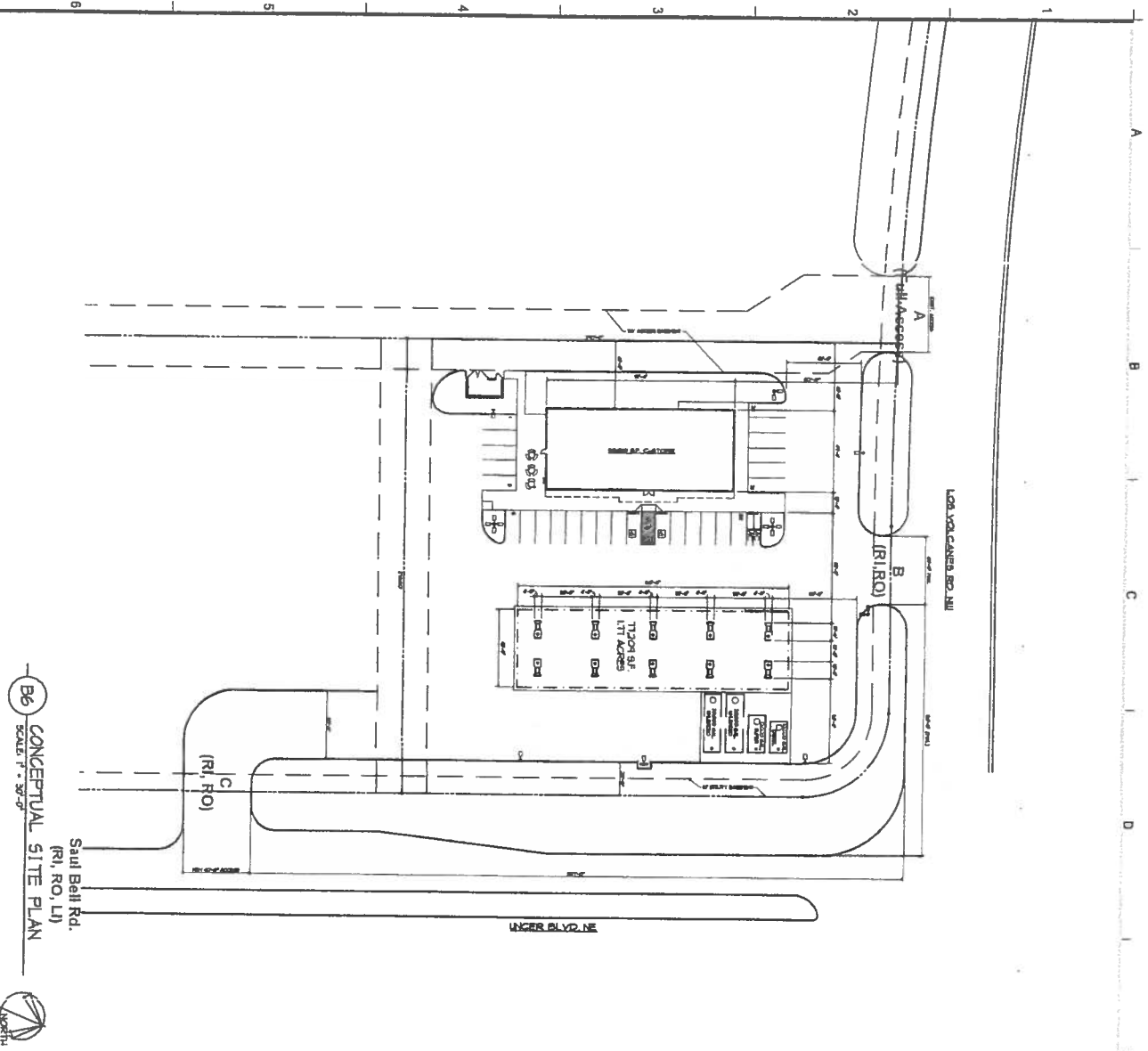


Map amended through: 6/13/2008



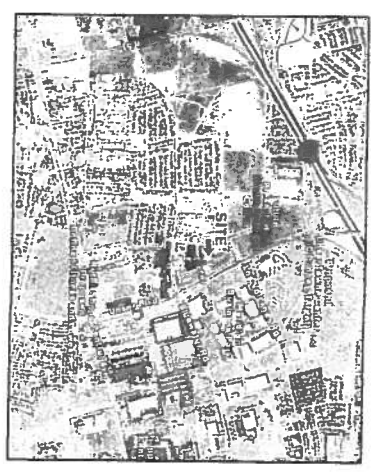


A-3



**B6** CONCEPTUAL SITE PLAN  
SCALE: 1" = 30'-0"

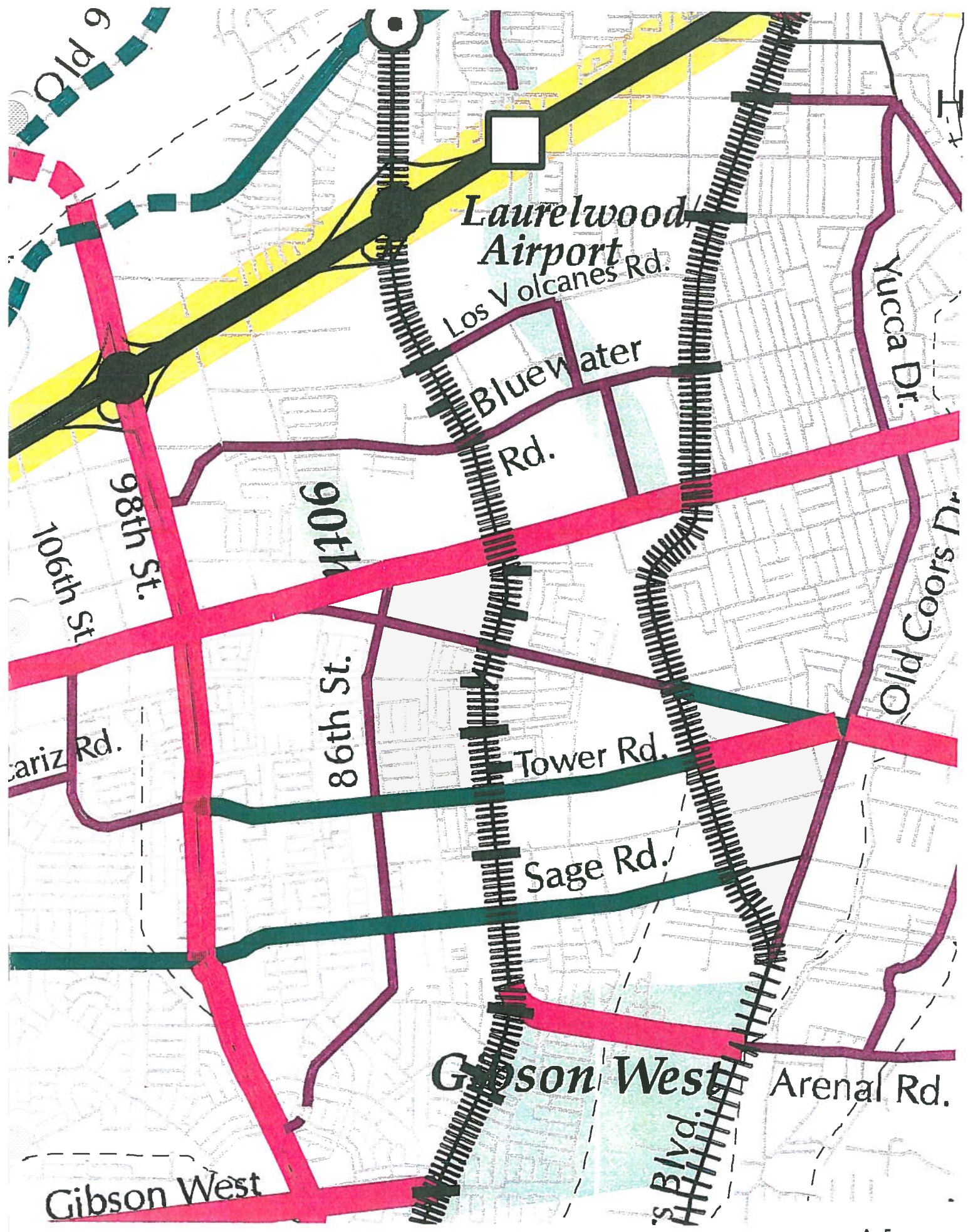
**F2** VICINITY MAP  
SCALE: NTS



**5500 S.F. BLDG.  
SCHEME 'D'**

| <br>Valero Retail Holdings, Inc.<br>3438 New Castle Dr.<br>Loveland, CO 80538<br>phone: 970.986.6302 |         | <br>CONCEPTUAL DESIGN ARCHITECTS<br>3438 New Castle Dr.<br>Loveland, CO 80538<br>phone: 970.986.6302 |  | <p>VALERO RETAIL HOLDINGS</p> <p>PROPOSED NTI</p> <p>LOS VOLCANES RD. NW &amp; UNSER BLVD. NW</p> <p>ALBUQUERQUE, NEW MEXICO</p> |  | <p>PROJECT NO. 0284-07</p> <table><tr><th>ISSUE</th><th>DATE</th></tr><tr><td>1</td><td>4-23-10</td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></table> |  | ISSUE | DATE | 1 | 4-23-10 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | <p>SHEET TITLE</p> <p>CONCEPTUAL SITE PLAN</p> <p>SHEET NO.</p> <p>CSP1.1</p> |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------|------|---|---------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|-------------------------------------------------------------------------------|--|
| ISSUE                                                                                                                                                                                     | DATE    |                                                                                                                                                                                           |  |                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                        |  |       |      |   |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                               |  |
| 1                                                                                                                                                                                         | 4-23-10 |                                                                                                                                                                                           |  |                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                        |  |       |      |   |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                               |  |
|                                                                                                                                                                                           |         |                                                                                                                                                                                           |  |                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                        |  |       |      |   |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                               |  |
|                                                                                                                                                                                           |         |                                                                                                                                                                                           |  |                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                        |  |       |      |   |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                               |  |
|                                                                                                                                                                                           |         |                                                                                                                                                                                           |  |                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                        |  |       |      |   |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                               |  |
|                                                                                                                                                                                           |         |                                                                                                                                                                                           |  |                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                        |  |       |      |   |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                               |  |
|                                                                                                                                                                                           |         |                                                                                                                                                                                           |  |                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                        |  |       |      |   |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                               |  |
|                                                                                                                                                                                           |         |                                                                                                                                                                                           |  |                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                        |  |       |      |   |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                               |  |
|                                                                                                                                                                                           |         |                                                                                                                                                                                           |  |                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                        |  |       |      |   |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                               |  |
|                                                                                                                                                                                           |         |                                                                                                                                                                                           |  |                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                        |  |       |      |   |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                               |  |
|                                                                                                                                                                                           |         |                                                                                                                                                                                           |  |                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                        |  |       |      |   |         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                               |  |





Laurelwood  
Airport

Los Volcanes Rd.

Bluewater  
Rd.

Yucca Dr.

Old Coors Dr.

Tower Rd.

Sage Rd.

Arenal Rd.

Gibson West

Gibson West

9106  
86th St.

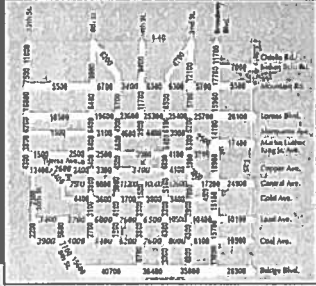
98th St.

106th St.

Cariz Rd.

s Blvd.

Inset for Downtown



Inset for Uptown



Average Weekday Traffic Flows



Standard Data  
9500  
Link Volume is based on traffic count data  
collected by the NM Department of Transportation  
Traffic Monitoring System (TMS) as standard in  
accordance with the New Mexico State Traffic  
Monitoring Standards (NMSTMS).

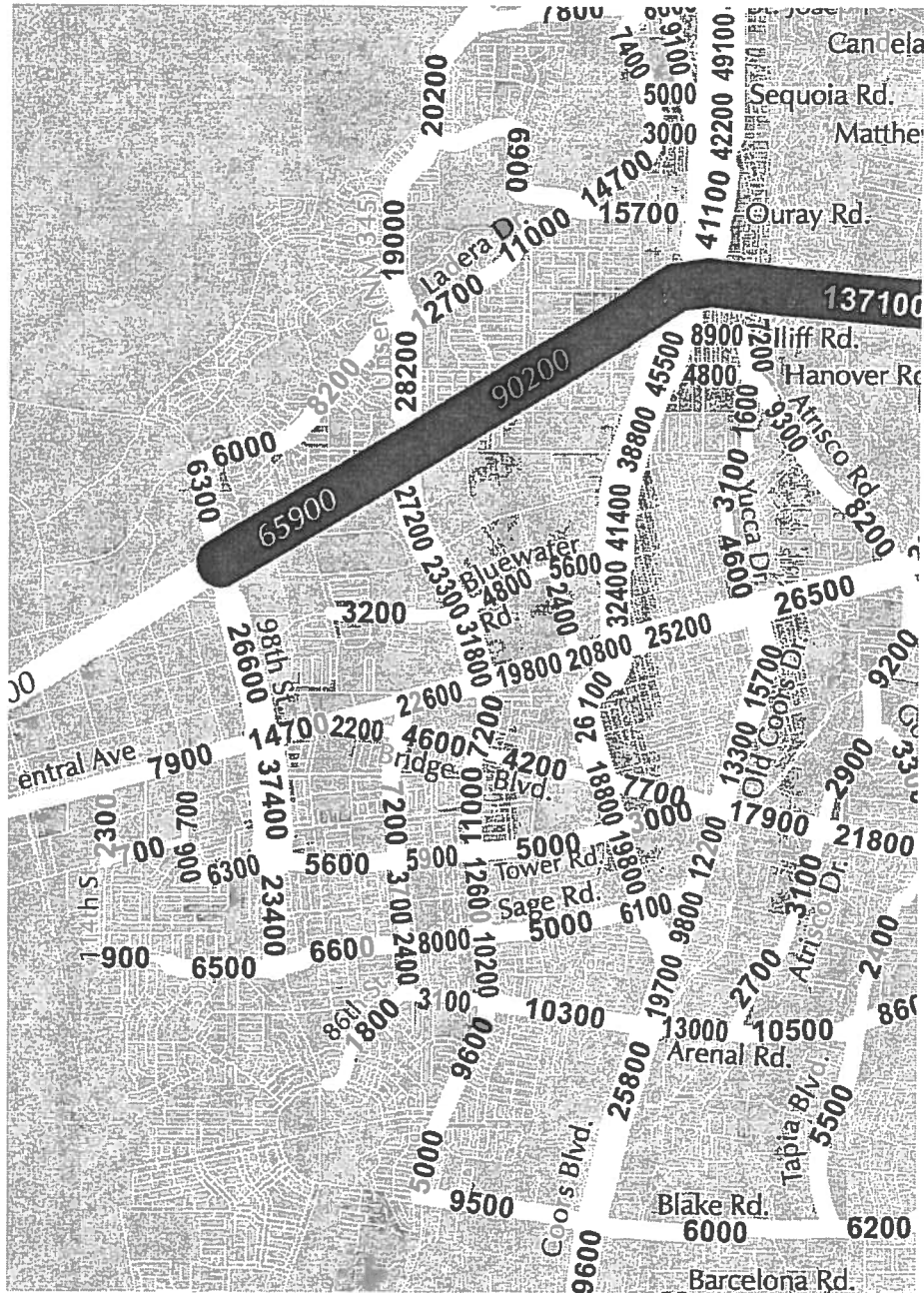
Standard Data  
9500  
Link Volume is based on traffic count data  
collected by the NM Department of Transportation  
Traffic Monitoring System (TMS) as standard in  
accordance with the New Mexico State Traffic  
Monitoring Standards (NMSTMS).

Inset for Los Lunas, Valencia County



## 2009 Traffic Flows for the Greater Albuquerque Area

Map prepared by the MTC Region Council of Governments in cooperation with the New Mexico  
Department of Transportation, the local governments in the Albuquerque Metropolitan Planning Area,  
and the U.S. Department of Transportation, Federal Highway Administration.



Portion of 2009 Traffic Flow Map  
 for the Greater Albuquerque Area  
 (Mid-Region Council of Governments)

*Valero Station (Los Volcanes Rd. / Unser Blvd.)*  
**Trip Generation Data (ITE Trip Generation Manual - 8th Edition)**

| USE (ITE CODE)                                         | DESCRIPTION | 24 HR VOL |      | A. M. PEAK HR. |      | P. M. PEAK HR. |      |
|--------------------------------------------------------|-------------|-----------|------|----------------|------|----------------|------|
|                                                        |             | GROSS     | EXIT | ENTER          | EXIT | ENTER          | EXIT |
| Summary Sheet                                          |             |           |      |                |      |                |      |
| Units                                                  |             |           |      |                |      |                |      |
| Gasoline / Service Station w/ Convenience Market (945) |             | 20        |      |                |      |                |      |
| Subtotal                                               |             | 3,256     | 102  | 102            | 102  | 134            | 134  |
| Pass-by Trip Adjustment                                |             |           |      |                |      |                | 20%  |
| Total Net New Trips to System                          |             | 3,256     | 102  | 102            | 102  | 107            | 107  |

**Valero Station (Los Volcanes Rd. / Unser Blvd.)**  
**Trip Generation Data (ITE Trip Generation Manual - 8th Edition)**

| USE (ITE CODE) | 24 HOUR TWO-WAY VOLUME |       | A.M. PEAK HOUR |       | P.M. PEAK HOUR |       |
|----------------|------------------------|-------|----------------|-------|----------------|-------|
|                | GROSS                  | ENTER | EXIT           | ENTER | EXIT           | ENTER |
| Units          |                        |       |                |       |                |       |
|                | 20.00                  | 102   | 102            | 134   | 134            | 134   |

**Gasoline / Service Station w/ Convenience Market (945)**

**Fueling Positions**

**ITE Trip Generation Equations:**

Average Vehicle Trip Ends on a Weekday (24 HOUR TWO-WAY VOLUME)

$$T = \begin{matrix} 162.78 & (X) & + & 0 \\ 50\% & \text{Enter,} & & 50\% \text{ Exit} \end{matrix}$$

Average Vehicle Trip Ends on a Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7am and 9am (A.M. PEAK HOUR)

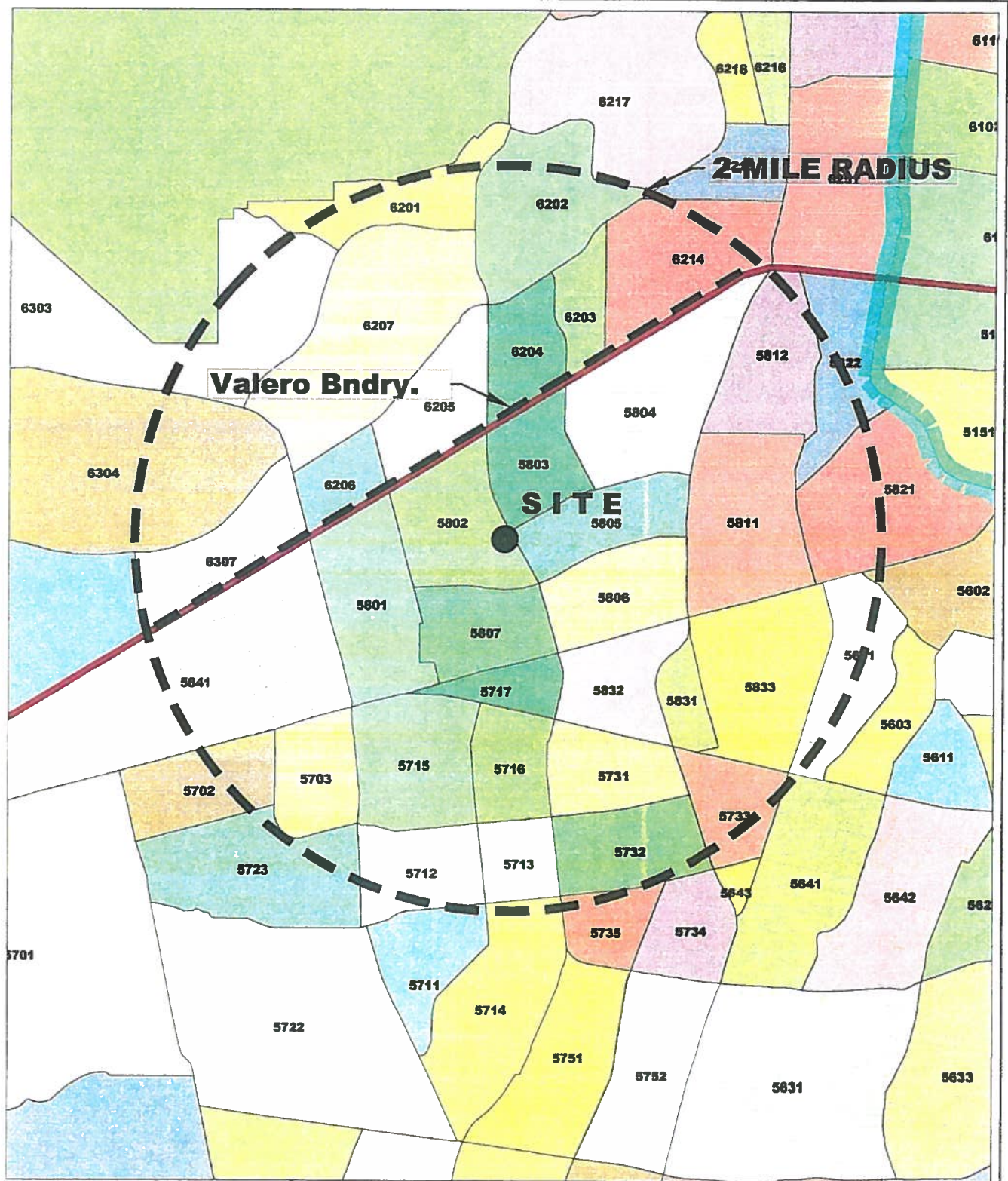
$$T = \begin{matrix} 10.16 & (X) & + & 0 \\ 50\% & \text{Enter,} & & 50\% \text{ Exit} \end{matrix}$$

Average Vehicle Trip Ends on a Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4pm and 6pm (P.M. PEAK HOUR)

$$T = \begin{matrix} 13.38 & (X) & + & 0 \\ 50\% & \text{Enter,} & & 50\% \text{ Exit} \end{matrix}$$

Comments:  
Tract No.

Based on ITE Trip Generation Manual - 8th Edition



**DATA ANALYSIS SUBZONE (DASZ) MAP**  
**Valero Commercial Development (Los Volcanes Rd. / Unser Blvd.)**

### Trip Distribution Table Valero Commercial Development (Los Volcanes Rd / Unser Blvd)

Data Analysis Subzone Population Data for determination of Local Trip Distribution for Proposed **Valero Trips**

2004 and 2030 Data Taken from Mid-Region Council of Governments' 2030 Socioeconomic

2030 Socioeconomic Forecasts by Data Analysis Subzones for the Mid-Region of New Mexico

| DASZ #                         | % Sub Area<br>In Study | 2004 |      | 2030 Population | Interpolated<br>Population for<br>the Year | Population In<br>Study | Percent<br>Population | (LE)<br>Los Volcanes Rd East |                           |            | (BE)<br>Bluewater Rd East |                           |            | (CE)<br>Central Ave East |                           |            |
|--------------------------------|------------------------|------|------|-----------------|--------------------------------------------|------------------------|-----------------------|------------------------------|---------------------------|------------|---------------------------|---------------------------|------------|--------------------------|---------------------------|------------|
|                                |                        | 2004 | 2030 |                 |                                            |                        |                       | % Utilizing                  | % Population<br>Utilizing | Population | % Utilizing               | % Population<br>Utilizing | Population | % Utilizing              | % Population<br>Utilizing | Population |
| Boundary Specified on DASZ Map |                        |      |      |                 |                                            |                        |                       |                              |                           |            |                           |                           |            |                          |                           |            |
| 5601                           | 50%                    | 1335 | 1608 | 1,419           | 710                                        | 2.41%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 100%       | 2.41%                    | 710                       |            |
| 5702                           | 40%                    | 49   | 58   | 52              | 21                                         | 0.07%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5703                           | 100%                   | 1890 | 1762 | 1,851           | 1,851                                      | 6.29%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5712                           | 90%                    | 1881 | 1992 | 1,915           | 1,724                                      | 6.85%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5713                           | 100%                   | 409  | 733  | 509             | 509                                        | 1.73%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5715                           | 100%                   | 2515 | 2774 | 2,595           | 2,595                                      | 8.81%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5716                           | 100%                   | 1795 | 2263 | 1,939           | 1,939                                      | 6.58%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5717                           | 100%                   | 3    | 350  | 110             | 110                                        | 0.37%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5723                           | 15%                    | 3993 | 4116 | 4,031           | 605                                        | 2.05%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5731                           | 100%                   | 1010 | 1063 | 1,026           | 1,026                                      | 3.48%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5732                           | 95%                    | 127  | 758  | 321             | 305                                        | 1.04%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5733                           | 80%                    | 110  | 573  | 220             | 144                                        | 0.39%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5801                           | 100%                   | 542  | 926  | 660             | 660                                        | 2.24%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5802                           | 100%                   | 467  | 432  | 456             | 456                                        | 1.55%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5803                           | 100%                   | 0    | 0    | 0               | 0                                          | 0.00%                  | 100%                  | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5804                           | 100%                   | 1983 | 2412 | 2,115           | 2,115                                      | 7.18%                  | 100%                  | 7.18%                        | 2,115                     | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5805                           | 100%                   | 79   | 97   | 85              | 85                                         | 0.29%                  | 50%                   | 0.14%                        | 43                        | 50%        | 0.14%                     | 43                        | 0%         | 0.00%                    | 0                         |            |
| 5806                           | 100%                   | 609  | 635  | 617             | 617                                        | 2.10%                  | 0%                    | 0.00%                        | 0                         | 50%        | 1.05%                     | 309                       | 50%        | 1.05%                    | 309                       |            |
| 5807                           | 100%                   | 737  | 1424 | 948             | 948                                        | 3.22%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5811                           | 100%                   | 3959 | 3816 | 3,915           | 3,915                                      | 13.30%                 | 0%                    | 0.00%                        | 0                         | 100%       | 13.30%                    | 3,915                     | 0%         | 0.00%                    | 0                         |            |
| 5812                           | 95%                    | 2322 | 2177 | 2,277           | 2,163                                      | 7.35%                  | 100%                  | 7.35%                        | 2,163                     | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5821                           | 50%                    | 1901 | 1916 | 1,906           | 953                                        | 3.24%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 100%       | 3.24%                    | 953                       |            |
| 5822                           | 40%                    | 998  | 1006 | 1,000           | 400                                        | 1.36%                  | 100%                  | 1.36%                        | 400                       | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5831                           | 100%                   | 609  | 635  | 617             | 617                                        | 2.10%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 75%        | 1.57%                    | 463                       |            |
| 5832                           | 100%                   | 1214 | 1283 | 1,235           | 1,235                                      | 4.19%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 0%         | 0.00%                    | 0                         |            |
| 5833                           | 100%                   | 3608 | 3385 | 3,539           | 3,539                                      | 12.02%                 | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 25%        | 1.05%                    | 309                       |            |
| 5841                           | 50%                    | 479  | 438  | 466             | 233                                        | 0.79%                  | 0%                    | 0.00%                        | 0                         | 0%         | 0.00%                     | 0                         | 50%        | 6.01%                    | 1,770                     |            |
|                                |                        |      |      |                 |                                            |                        |                       |                              |                           | 4,721      | 16.03%                    | 4,266                     | 14.49%     | 4,613                    | 15.32%                    |            |

### Trip Distribution Table Valero Commercial Development (Los Volcanes Rd / Unser Blvd)

Data Analysis Subzone Population Data for determination of Local Trip Distribution for Proposed **Valero Trips**

2004 and 2030 Data Taken from Mid-Region Council of Governments' 2030 Socioeconomic  
2030 Socioeconomic Forecasts by Data Analysis Subzones for the Mid-Region of New Mexico

| DASZ #                         | % Sub Area<br>In Study | 2004 Population |          | 2030 Population | Interpolated<br>Population for<br>the Year | Population In<br>Study | Percent<br>Population | (US)        |                           | (CW)       |             | (EW)                      |            |             |                           |
|--------------------------------|------------------------|-----------------|----------|-----------------|--------------------------------------------|------------------------|-----------------------|-------------|---------------------------|------------|-------------|---------------------------|------------|-------------|---------------------------|
|                                |                        | 2004            | 2004 Map |                 |                                            |                        |                       | % Utilizing | % Population<br>Utilizing | Population | % Utilizing | % Population<br>Utilizing | Population | % Utilizing | % Population<br>Utilizing |
| Boundary Specified on DASZ Map |                        |                 |          |                 |                                            |                        |                       |             |                           |            |             |                           |            |             |                           |
| 5601                           | 50%                    | 1335            | 1608     | 1,419           | 710                                        | 2.41%                  | 0%                    | 0.00%       | 0                         | 0%         | 0.00%       | 0                         | 0.00%      | 0           |                           |
| 5702                           | 40%                    | 49              | 58       | 52              | 21                                         | 0.07%                  | 0%                    | 0.00%       | 0                         | 100%       | 0.07%       | 21                        | 0%         | 0.00%       | 0                         |
| 5703                           | 100%                   | 1890            | 1762     | 1,851           | 1,851                                      | 6.29%                  | 0%                    | 0.00%       | 0                         | 100%       | 6.29%       | 1,851                     | 0%         | 0.00%       | 0                         |
| 5712                           | 90%                    | 1881            | 1992     | 1,915           | 1,724                                      | 5.85%                  | 0%                    | 0.00%       | 0                         | 50%        | 2.93%       | 862                       | 0%         | 0.00%       | 0                         |
| 5713                           | 100%                   | 409             | 733      | 509             | 509                                        | 1.73%                  | 0%                    | 0.00%       | 0                         | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5715                           | 100%                   | 2515            | 2774     | 2,595           | 2,595                                      | 8.81%                  | 0%                    | 0.00%       | 0                         | 100%       | 8.81%       | 2,595                     | 0%         | 0.00%       | 0                         |
| 5716                           | 100%                   | 1795            | 2263     | 1,939           | 1,939                                      | 6.58%                  | 0%                    | 0.00%       | 0                         | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5717                           | 100%                   | 3               | 5717     | 110             | 110                                        | 0.37%                  | 0%                    | 0.00%       | 0                         | 50%        | 0.19%       | 55                        | 0%         | 0.00%       | 0                         |
| 5723                           | 15%                    | 3993            | 4116     | 4,031           | 605                                        | 2.05%                  | 0%                    | 0.00%       | 0                         | 100%       | 2.05%       | 605                       | 0%         | 0.00%       | 0                         |
| 5731                           | 100%                   | 1010            | 1083     | 1,026           | 1,026                                      | 3.48%                  | 0%                    | 0.00%       | 0                         | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5732                           | 95%                    | 127             | 758      | 321             | 305                                        | 1.04%                  | 0%                    | 0.00%       | 0                         | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5733                           | 80%                    | 110             | 220      | 144             | 115                                        | 0.39%                  | 100%                  | 0.39%       | 115                       | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5801                           | 100%                   | 542             | 926      | 660             | 660                                        | 2.24%                  | 0%                    | 0.00%       | 0                         | 20%        | 0.45%       | 132                       | 0%         | 0.00%       | 0                         |
| 5802                           | 100%                   | 467             | 432      | 456             | 456                                        | 1.55%                  | 0%                    | 0.00%       | 0                         | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5803                           | 100%                   | 0               | 0        | 0               | 0                                          | 0.00%                  | 0%                    | 0.00%       | 0                         | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5804                           | 100%                   | 1983            | 2412     | 2,115           | 2,115                                      | 7.18%                  | 0%                    | 0.00%       | 0                         | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5805                           | 100%                   | 79              | 97       | 85              | 85                                         | 0.28%                  | 0%                    | 0.00%       | 0                         | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5806                           | 100%                   | 609             | 635      | 617             | 617                                        | 2.10%                  | 0%                    | 0.00%       | 0                         | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5807                           | 100%                   | 737             | 1424     | 948             | 948                                        | 3.22%                  | 0%                    | 0.00%       | 0                         | 20%        | 0.64%       | 190                       | 0%         | 0.00%       | 0                         |
| 5811                           | 100%                   | 3959            | 3816     | 3,915           | 3,915                                      | 13.30%                 | 0%                    | 0.00%       | 0                         | 0%         | 0.00%       | 0                         | 80%        | 2.58%       | 758                       |
| 5812                           | 95%                    | 2322            | 2177     | 2,277           | 2,163                                      | 7.35%                  | 0%                    | 0.00%       | 0                         | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5821                           | 50%                    | 1901            | 1916     | 1,906           | 953                                        | 3.24%                  | 0%                    | 0.00%       | 0                         | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5822                           | 40%                    | 998             | 1006     | 1,000           | 400                                        | 1.36%                  | 0%                    | 0.00%       | 0                         | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5831                           | 100%                   | 609             | 635      | 617             | 617                                        | 2.10%                  | 25%                   | 0.52%       | 154                       | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5832                           | 100%                   | 1214            | 1283     | 1,235           | 1,235                                      | 4.19%                  | 75%                   | 3.15%       | 925                       | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5833                           | 100%                   | 3608            | 3385     | 3,539           | 3,539                                      | 12.02%                 | 50%                   | 6.01%       | 1,770                     | 0%         | 0.00%       | 0                         | 0%         | 0.00%       | 0                         |
| 5841                           | 50%                    | 479             | 438      | 466             | 233                                        | 0.79%                  | 0%                    | 0.00%       | 0                         | 100%       | 0.79%       | 233                       | 0%         | 0.00%       | 0                         |
|                                |                        |                 |          | 35,748          | 29,446                                     | 100.00%                |                       |             | 2,965                     |            |             | 8,544                     |            |             | 758                       |
|                                |                        |                 |          |                 |                                            | 29,446                 | 100.07%               |             |                           |            |             | 22.22%                    |            |             | 2.58%                     |

**Trip Distribution Table**  
**Valero Commercial Development (Los Volcanes Rd / Unser Blvd)**

Data Analysis Subzone Population Data for determination of Local Trip Distribution for Proposed **Valero Trips**

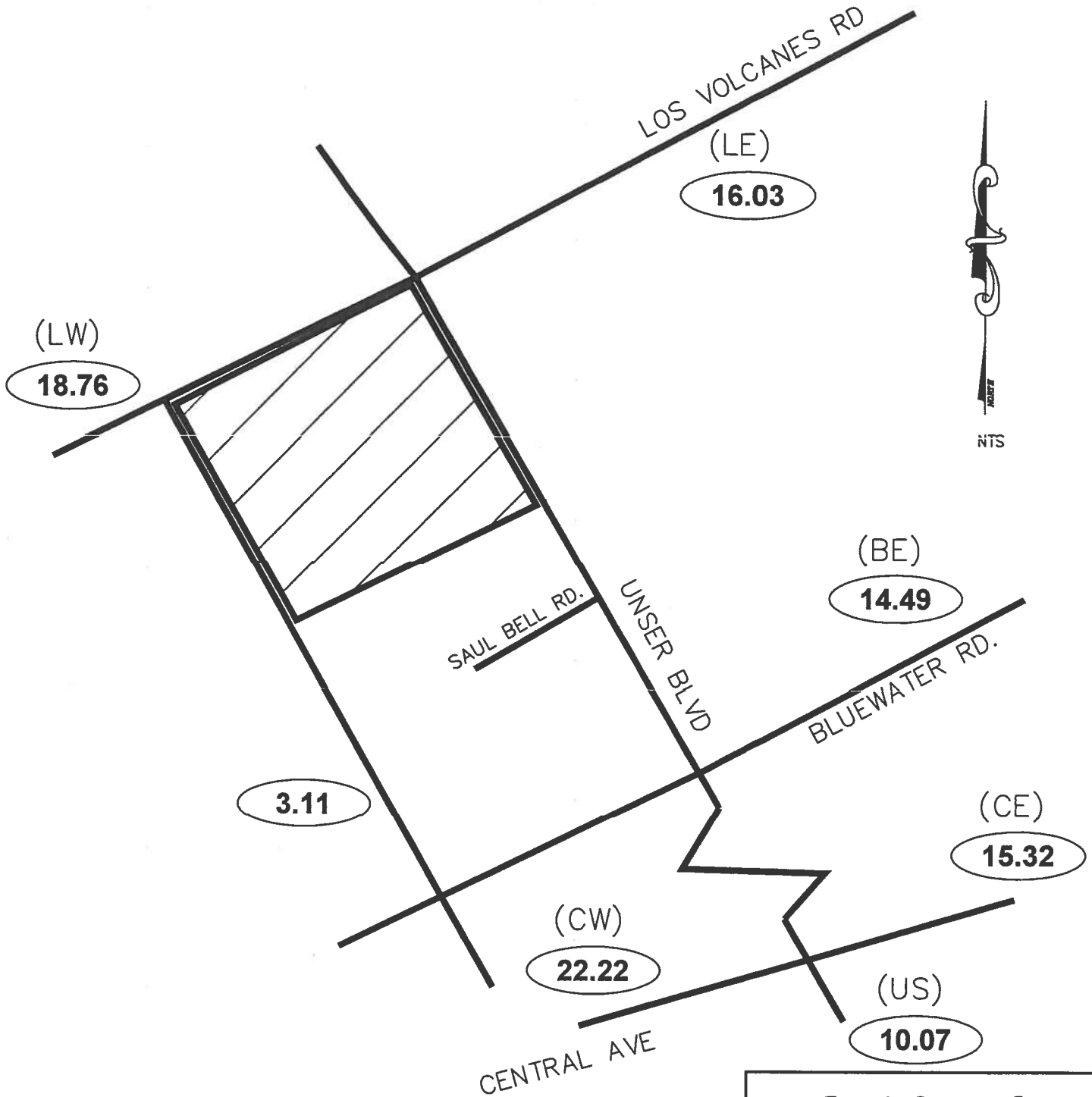
2004 and 2030 Data Taken from Mid-Region Council of Governments' 2030 Socioeconomic  
 2030 Socioeconomic Forecasts by Data Analysis Subzones for the Mid-Region of New Mexico

| DASZ #                         | % Sub Area<br>In Study | 2004            |      | 2030 Population | Interpolated<br>Population for<br>the Year | Population in<br>Study | Percent<br>Population | (LW)        |                           |            | (SW)        |                           |            |
|--------------------------------|------------------------|-----------------|------|-----------------|--------------------------------------------|------------------------|-----------------------|-------------|---------------------------|------------|-------------|---------------------------|------------|
|                                |                        | 2004 Population |      |                 |                                            |                        |                       | % Utilizing | % Population<br>Utilizing | Population | % Utilizing | % Population<br>Utilizing | Population |
| Boundary Specified on DASZ Map |                        |                 |      |                 |                                            |                        |                       |             |                           |            |             |                           |            |
| 5601                           | 50%                    | 1335            | 1608 | 1,419           | 710                                        | 2.41%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5702                           | 40%                    | 48              | 58   | 52              | 21                                         | 0.07%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5703                           | 100%                   | 1890            | 1762 | 1,851           | 1,851                                      | 6.29%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5712                           | 90%                    | 1881            | 1992 | 1,915           | 1,724                                      | 5.85%                  |                       | 50%         | 2.93%                     | 862        | 0%          | 0.00%                     | 0          |
| 5713                           | 100%                   | 408             | 733  | 509             | 509                                        | 1.73%                  |                       | 100%        | 1.73%                     | 509        | 0%          | 0.00%                     | 0          |
| 5715                           | 100%                   | 2515            | 2774 | 2,595           | 2,595                                      | 8.81%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5716                           | 100%                   | 1795            | 2263 | 1,939           | 1,939                                      | 6.58%                  |                       | 100%        | 6.58%                     | 1,939      | 0%          | 0.00%                     | 0          |
| 5717                           | 100%                   | 3               | 350  | 110             | 110                                        | 0.37%                  |                       | 50%         | 0.19%                     | 55         | 0%          | 0.00%                     | 0          |
| 5723                           | 15%                    | 3993            | 4116 | 4,031           | 605                                        | 2.05%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5731                           | 100%                   | 1010            | 1063 | 1,026           | 1,026                                      | 3.48%                  |                       | 100%        | 3.48%                     | 1,026      | 0%          | 0.00%                     | 0          |
| 5732                           | 95%                    | 127             | 758  | 321             | 305                                        | 1.04%                  |                       | 100%        | 1.04%                     | 305        | 0%          | 0.00%                     | 0          |
| 5733                           | 80%                    | 110             | 220  | 144             | 115                                        | 0.39%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5801                           | 100%                   | 542             | 926  | 660             | 660                                        | 2.24%                  |                       | 70%         | 1.57%                     | 462        | 10%         | 0.22%                     | 66         |
| 5802                           | 100%                   | 467             | 432  | 456             | 456                                        | 1.65%                  |                       | 80%         | 1.24%                     | 365        | 20%         | 0.31%                     | 91         |
| 5803                           | 100%                   | 0               | 0    | 0               | 0                                          | 0.00%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5804                           | 100%                   | 1983            | 2412 | 2,115           | 2,115                                      | 7.18%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5805                           | 100%                   | 79              | 97   | 85              | 85                                         | 0.29%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5806                           | 100%                   | 609             | 635  | 617             | 617                                        | 2.10%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5807                           | 100%                   | 737             | 1424 | 948             | 948                                        | 3.22%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5811                           | 100%                   | 3959            | 3816 | 3,915           | 3,915                                      | 13.30%                 |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5812                           | 95%                    | 2322            | 2177 | 2,277           | 2,163                                      | 7.35%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5821                           | 50%                    | 1901            | 1916 | 1,906           | 953                                        | 3.24%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5822                           | 40%                    | 998             | 1006 | 1,000           | 400                                        | 1.35%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5831                           | 100%                   | 609             | 635  | 617             | 617                                        | 2.10%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5832                           | 100%                   | 1214            | 1283 | 1,235           | 1,235                                      | 4.19%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5833                           | 100%                   | 3608            | 3385 | 3,539           | 3,539                                      | 12.02%                 |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
| 5841                           | 50%                    | 479             | 438  | 466             | 233                                        | 0.79%                  |                       | 0%          | 0.00%                     | 0          | 0%          | 0.00%                     | 0          |
|                                |                        |                 |      |                 |                                            | 29,446                 | 100.00%               |             |                           |            | 5,523       |                           |            |
|                                |                        |                 |      |                 |                                            | 35,748                 |                       |             |                           |            | 18.76%      |                           |            |
|                                |                        |                 |      |                 |                                            |                        |                       |             |                           |            | 157         |                           |            |
|                                |                        |                 |      |                 |                                            |                        |                       |             |                           |            | 0.53%       |                           |            |

# *Valero Commercial Development*

(Los Volcanes Rd / Unser Blvd)

Trip Distribution Map (%)

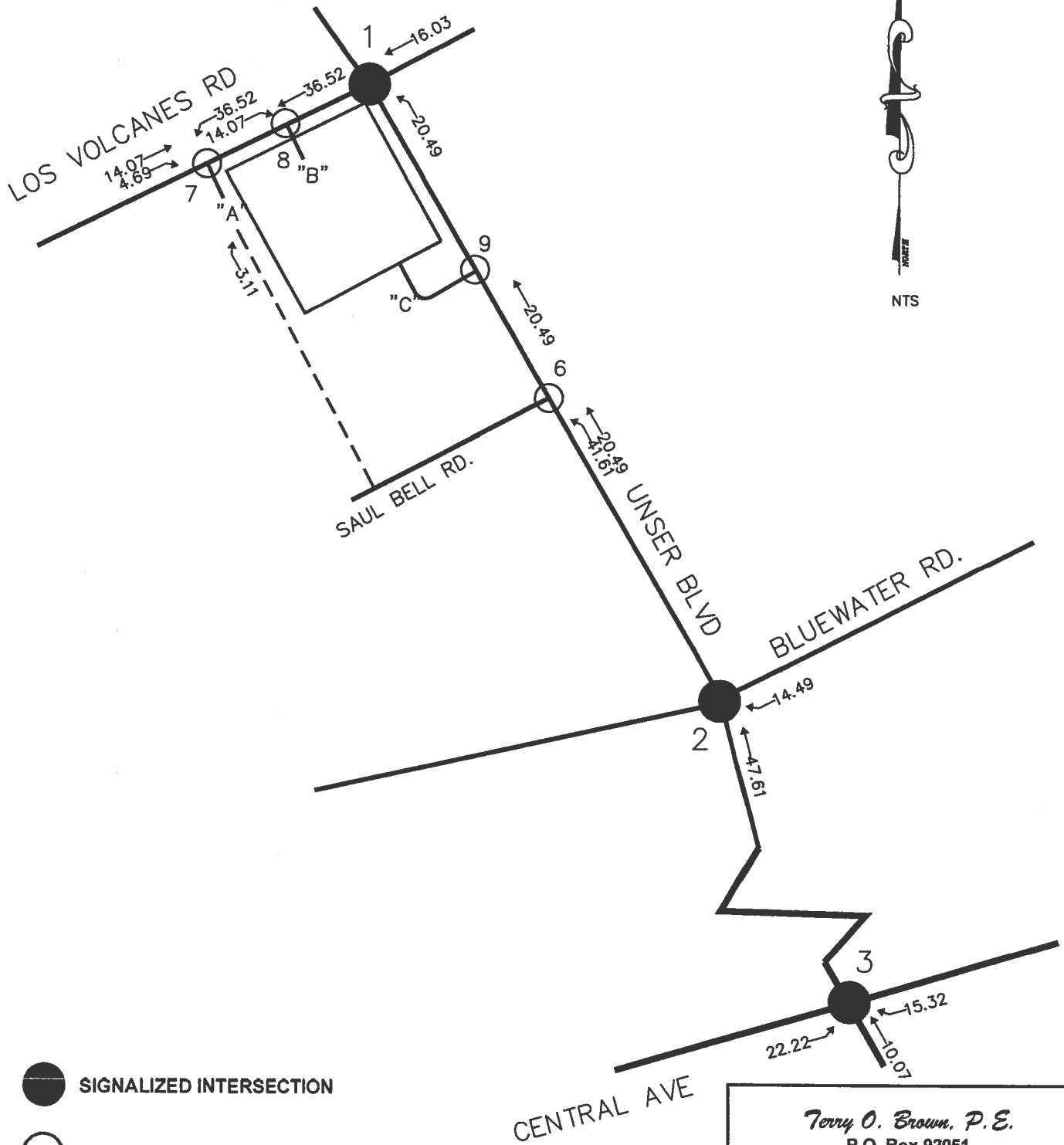


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# Valero Commercial Development

(Los Volcanes Rd / Unser Blvd)

Trip Assignments (% Entering)

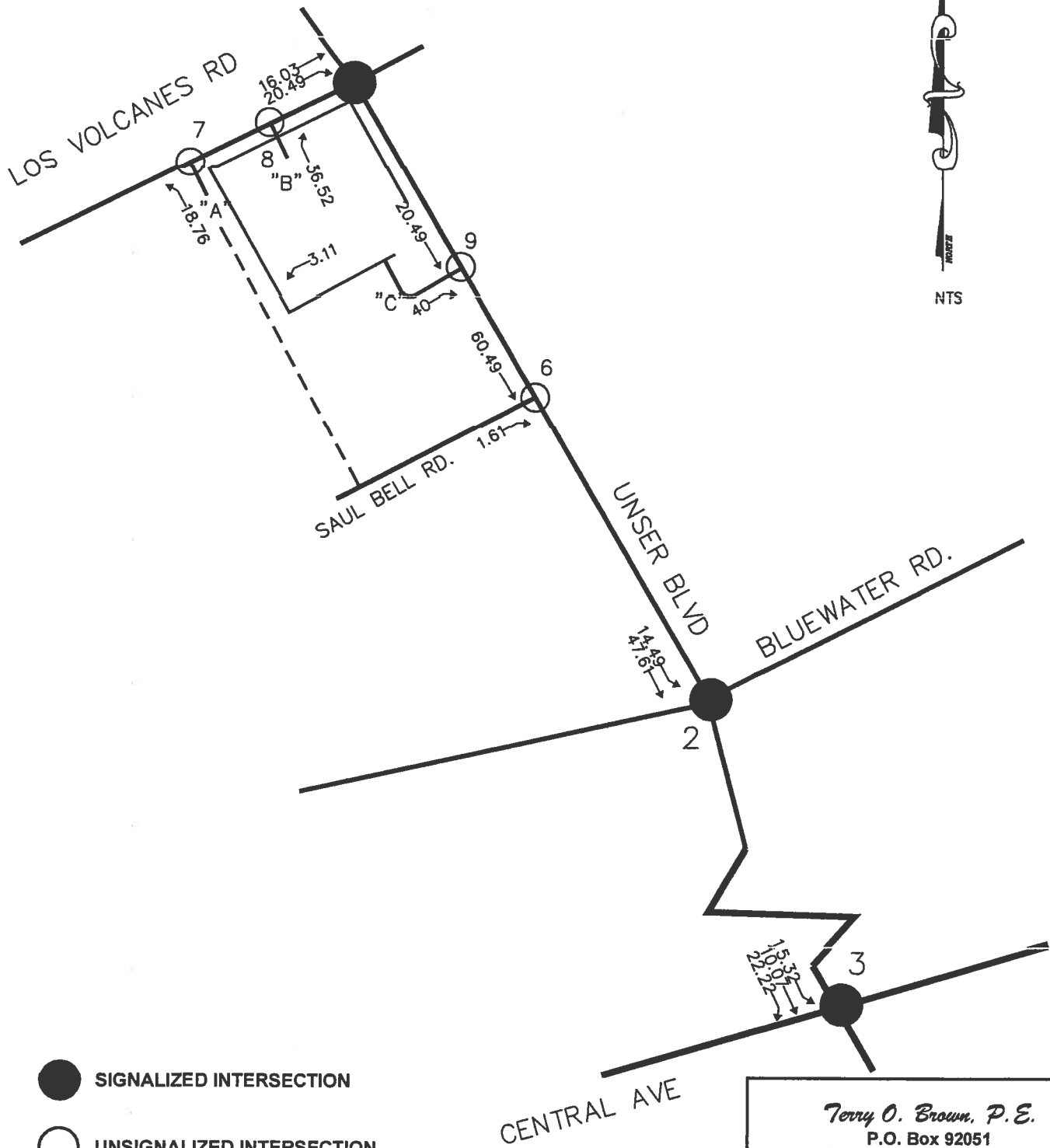


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# Valero Commercial Development

(Los Volcanes Rd / Unser Blvd)

Trip Assignments (% Exiting)

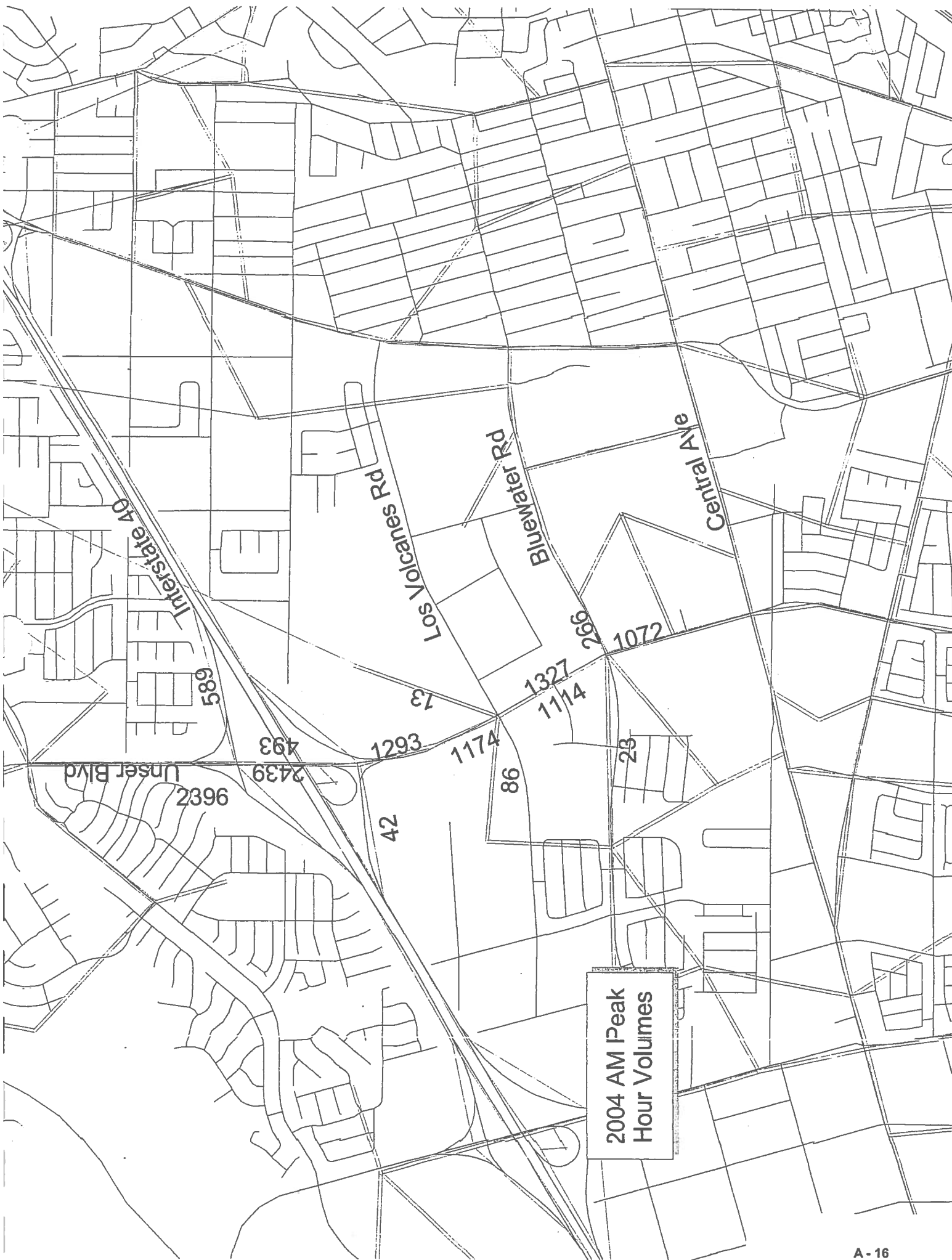


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### Passby Trips (%)



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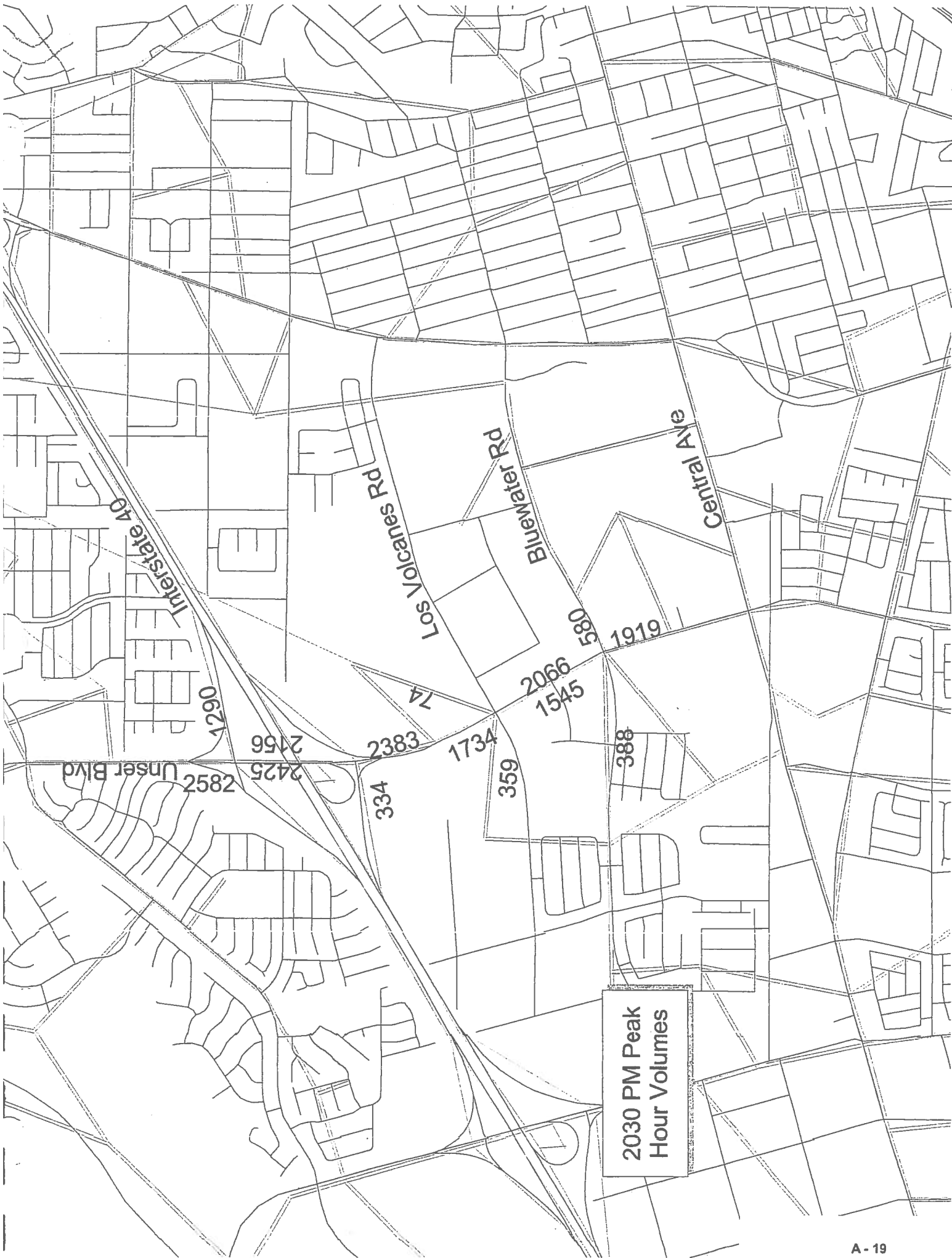
2004 AM Peak  
Hour Volumes



2004 PM Peak  
Hour Volumes



2030 AM Peak  
Hour Volumes



2030 PM Peak  
Hour Volumes

# Valero Commercial Development (Los Volcanes Rd / Unser Blvd)

## Projected Turning Movements SUMMARY PROPOSED DEVELOPMENT (2012) - 100% Development

### INTERSECTION: Summary

| Los Volcanes Rd / Unser Blvd |            | 0.93                        |      |       | 0.75                        |      |       | 0.90                    |       |       | 0.85                    |       |       | PHF |
|------------------------------|------------|-----------------------------|------|-------|-----------------------------|------|-------|-------------------------|-------|-------|-------------------------|-------|-------|-----|
| (1)                          |            | Eastbound (Los Volcanes Rd) |      |       | Westbound (Los Volcanes Rd) |      |       | Northbound (Unser Blvd) |       |       | Southbound (Unser Blvd) |       |       |     |
|                              | 3.0% Truck | Left                        | Thru | Right | Left                        | Thru | Right | Left                    | Thru  | Right | Left                    | Thru  | Right |     |
| Existing (2010)              |            | 172                         | 119  | 11    | 58                          | 29   | 136   | 23                      | 1,156 | 115   | 405                     | 1,511 | 208   |     |
| 2012 (NO BUILD - A.M.)       |            | 182                         | 127  | 12    | 94                          | 32   | 152   | 24                      | 1,253 | 147   | 462                     | 1,614 | 220   |     |
| 2012 (BUILD - A.M.)          |            | 182                         | 143  | 33    | 94                          | 48   | 152   | 45                      | 1,253 | 147   | 462                     | 1,614 | 220   |     |

|                 |                        | 0.89                        |      |       | 0.94                        |      |       | 0.91                    |       |       | 0.92                    |       |       | PHF |
|-----------------|------------------------|-----------------------------|------|-------|-----------------------------|------|-------|-------------------------|-------|-------|-------------------------|-------|-------|-----|
| Existing (2010) |                        | Eastbound (Los Volcanes Rd) |      |       | Westbound (Los Volcanes Rd) |      |       | Northbound (Unser Blvd) |       |       | Southbound (Unser Blvd) |       |       |     |
|                 |                        | Left                        | Thru | Right | Left                        | Thru | Right | Left                    | Thru  | Right | Left                    | Thru  | Right |     |
|                 |                        | 96                          | 16   | 16    | 68                          | 20   | 209   | 10                      | 1,045 | 83    | 141                     | 1,147 | 108   |     |
|                 | 2012 (NO BUILD - P.M.) | 113                         | 21   | 19    | 180                         | 23   | 269   | 11                      | 1,184 | 137   | 223                     | 1,167 | 111   |     |
|                 | 2012 (BUILD - P.M.)    | 126                         | 38   | 46    | 180                         | 40   | 269   | 36                      | 1,171 | 137   | 223                     | 1,163 | 115   |     |

| Bluewater Rd. / Unser Blvd |            | 0.83                      |      |       | 0.75                      |      |       | 0.92                    |       |       | 0.85                    |      |       | PHF |
|----------------------------|------------|---------------------------|------|-------|---------------------------|------|-------|-------------------------|-------|-------|-------------------------|------|-------|-----|
| (2)                        |            | Eastbound (Bluewater Rd.) |      |       | Westbound (Bluewater Rd.) |      |       | Northbound (Unser Blvd) |       |       | Southbound (Unser Blvd) |      |       |     |
|                            | 3.0% Truck | Left                      | Thru | Right | Left                      | Thru | Right | Left                    | Thru  | Right | Left                    | Thru | Right |     |
| Existing (2010)            |            | 177                       | 79   | 81    | 45                        | 46   | 52    | 70                      | 1,233 | 89    | 148                     | 704  | 97    |     |
| 2012 (NO BUILD - A.M.)     |            | 184                       | 81   | 84    | 48                        | 49   | 55    | 75                      | 1,359 | 94    | 161                     | 809  | 106   |     |
| 2012 (BUILD - A.M.)        |            | 184                       | 81   | 84    | 48                        | 49   | 70    | 75                      | 1,408 | 94    | 176                     | 858  | 106   |     |

|                                                                  |                           | 0.78 |       |  | 0.95                      |      |       | 0.95                    |       |       | 0.92                    |       |       | PHF |
|------------------------------------------------------------------|---------------------------|------|-------|--|---------------------------|------|-------|-------------------------|-------|-------|-------------------------|-------|-------|-----|
| Existing (2010)<br>2012 (NO BUILD - P.M.)<br>2012 (BUILD - P.M.) | Eastbound (Bluewater Rd.) |      |       |  | Westbound (Bluewater Rd.) |      |       | Northbound (Unser Blvd) |       |       | Southbound (Unser Blvd) |       |       |     |
|                                                                  | Left                      | Thru | Right |  | Left                      | Thru | Right | Left                    | Thru  | Right | Left                    | Thru  | Right |     |
|                                                                  | 97                        | 53   | 57    |  | 91                        | 89   | 183   | 63                      | 865   | 28    | 85                      | 1,100 | 124   |     |
|                                                                  | 109                       | 58   | 63    |  | 96                        | 94   | 194   | 70                      | 1,050 | 31    | 87                      | 1,217 | 130   |     |
|                                                                  | 109                       | 58   | 63    |  | 96                        | 94   | 210   | 70                      | 1,101 | 31    | 103                     | 1,268 | 130   |     |

| Central Ave / Unser Blvd |            | 0.85                    |      |       | 0.85                    |      |       | 0.85                    |      |       | 0.85                    |      |       | PHF |
|--------------------------|------------|-------------------------|------|-------|-------------------------|------|-------|-------------------------|------|-------|-------------------------|------|-------|-----|
| (3)                      |            | Eastbound (Central Ave) |      |       | Westbound (Central Ave) |      |       | Northbound (Unser Blvd) |      |       | Southbound (Unser Blvd) |      |       |     |
|                          | 3.0% Truck | Left                    | Thru | Right | Left                    | Thru | Right | Left                    | Thru | Right | Left                    | Thru | Right |     |
| Existing (2010)          |            | 0                       | 0    | 0     | 0                       | 0    | 0     | 0                       | 0    | 0     | 0                       | 0    | 0     | 0   |
| 2012 (NO BUILD - A.M.)   |            | 0                       | 0    | 0     | 0                       | 0    | 0     | 0                       | 0    | 0     | 0                       | 0    | 0     | 0   |
| 2012 (BUILD - A.M.)      |            | 23                      | 0    | 0     | 0                       | 0    | 16    | 0                       | 10   | 0     | 16                      | 10   | 23    |     |

|                        |                         | 0.85 |      |    | 0.85                    |    |      | 0.85 |                         |   | 0.85 |    |                         | PHF |      |  |
|------------------------|-------------------------|------|------|----|-------------------------|----|------|------|-------------------------|---|------|----|-------------------------|-----|------|--|
| Trip assignments only  | Eastbound (Central Ave) |      |      |    | Westbound (Central Ave) |    |      |      | Northbound (Unser Blvd) |   |      |    | Southbound (Unser Blvd) |     |      |  |
|                        | Left                    |      | Thru |    | Left                    |    | Thru |      | Left                    |   | Thru |    | Left                    |     | Thru |  |
|                        | Right                   |      |      |    | Right                   |    |      |      | Right                   |   |      |    | Right                   |     |      |  |
|                        | 0                       |      | 0    |    | 0                       |    | 0    |      | 0                       |   | 0    |    | 0                       |     | 0    |  |
|                        | 0                       |      | 0    |    | 0                       |    | 0    |      | 0                       |   | 0    |    | 0                       |     | 0    |  |
| Existing (2010)        |                         | 0    |      | 0  |                         | 0  |      | 0    |                         | 0 |      | 0  |                         | 0   |      |  |
| 2012 (NO BUILD - P.M.) |                         | 0    |      | 0  |                         | 0  |      | 0    |                         | 0 |      | 0  |                         | 0   |      |  |
| 2012 (BUILD - P.M.)    |                         | 24   |      | 0  |                         | 0  |      | 16   |                         | 0 |      | 11 |                         | 0   |      |  |
|                        |                         | 16   |      | 11 |                         | 24 |      |      |                         |   |      |    |                         |     |      |  |

| I-40 N. Ramp / Unser Blvd |                        | 0.90                     |      |       | 0.86                     |      |       | 0.85                    |      |       | 0.99                    |       |       | PHF |
|---------------------------|------------------------|--------------------------|------|-------|--------------------------|------|-------|-------------------------|------|-------|-------------------------|-------|-------|-----|
| (4)                       |                        | Eastbound (I-40 N. Ramp) |      |       | Westbound (I-40 N. Ramp) |      |       | Northbound (Unser Blvd) |      |       | Southbound (Unser Blvd) |       |       |     |
|                           | 3.0% Truck             | Left                     | Thru | Right | Left                     | Thru | Right | Left                    | Thru | Right | Left                    | Thru  | Right |     |
|                           | Existing (2010)        | 0                        | 0    | 0     | 376                      | 0    | 0     | 33                      | 602  | 0     | 0                       | 2,222 | 0     | 0   |
|                           | 2012 (NO BUILD - A.M.) | 0                        | 0    | 0     | 391                      | 0    | 0     | 36                      | 659  | 0     | 0                       | 2,341 | 0     | 0   |
|                           | 2012 (BUILD - A.M.)    | 0                        | 0    | 0     | 391                      | 0    | 0     | 36                      | 659  | 0     | 0                       | 2,341 | 0     | 0   |

|                                                                  |                          | 0.90 |      |  | 0.83                     |  |      | 0.80 |                         |  | 0.85  |  |                         | PHF |       |  |       |  |
|------------------------------------------------------------------|--------------------------|------|------|--|--------------------------|--|------|------|-------------------------|--|-------|--|-------------------------|-----|-------|--|-------|--|
| Existing (2010)<br>2012 (NO BUILD - P.M.)<br>2012 (BUILD - P.M.) | Eastbound (I-40 N. Ramp) |      |      |  | Westbound (I-40 N. Ramp) |  |      |      | Northbound (Unser Blvd) |  |       |  | Southbound (Unser Blvd) |     |       |  |       |  |
|                                                                  | Left                     |      | Thru |  | Right                    |  | Left |      | Thru                    |  | Right |  | Left                    |     | Thru  |  | Right |  |
|                                                                  | 0                        |      | 0    |  | 0                        |  | 921  |      | 3                       |  | 0     |  | 23                      |     | 915   |  | 0     |  |
|                                                                  | 0                        |      | 0    |  | 0                        |  | 958  |      | 3                       |  | 0     |  | 26                      |     | 1,034 |  | 0     |  |
|                                                                  | 0                        |      | 0    |  | 0                        |  | 958  |      | 3                       |  | 0     |  | 26                      |     | 1,034 |  | 0     |  |

# Valero Commercial Development (Los Volcanes Rd / Unser Blvd)

## Projected Turning Movements SUMMARY PROPOSED DEVELOPMENT (2012) - 100% Development

### INTERSECTION: Summary

#### I-40 S. Ramp / Unser Blvd

(5)

3.0% Truck

Existing (2010)

2012 (NO BUILD - A.M.)

2012 (BUILD - A.M.)

| 0.78                     |      |       | 0.90                     |      |       | 0.84                    |      |       | 0.85                    |       |       | PHF |
|--------------------------|------|-------|--------------------------|------|-------|-------------------------|------|-------|-------------------------|-------|-------|-----|
| Eastbound (I-40 S. Ramp) |      |       | Westbound (I-40 S. Ramp) |      |       | Northbound (Unser Blvd) |      |       | Southbound (Unser Blvd) |       |       |     |
| Left                     | Thru | Right | Left                     | Thru | Right | Left                    | Thru | Right | Left                    | Thru  | Right |     |
| 82                       | 0    | 40    | 0                        | 0    | 0     | 0                       | 628  | 0     | 0                       | 2,124 | 0     |     |
| 89                       | 0    | 43    | 0                        | 0    | 0     | 0                       | 689  | 0     | 0                       | 2,272 | 0     |     |
| 89                       | 0    | 43    | 0                        | 0    | 0     | 0                       | 689  | 0     | 0                       | 2,272 | 0     |     |

Existing (2010)

2012 (NO BUILD - P.M.)

2012 (BUILD - P.M.)

| 0.86                     |      |       | 0.90                     |      |       | 0.80                    |       |       | 0.94                    |       |       | PHF |
|--------------------------|------|-------|--------------------------|------|-------|-------------------------|-------|-------|-------------------------|-------|-------|-----|
| Eastbound (I-40 S. Ramp) |      |       | Westbound (I-40 S. Ramp) |      |       | Northbound (Unser Blvd) |       |       | Southbound (Unser Blvd) |       |       |     |
| Left                     | Thru | Right | Left                     | Thru | Right | Left                    | Thru  | Right | Left                    | Thru  | Right |     |
| 122                      | 0    | 47    | 0                        | 0    | 0     | 0                       | 938   | 0     | 0                       | 1,432 | 0     |     |
| 134                      | 0    | 52    | 0                        | 0    | 0     | 0                       | 1,060 | 0     | 0                       | 1,547 | 0     |     |
| 134                      | 0    | 52    | 0                        | 0    | 0     | 0                       | 1,060 | 0     | 0                       | 1,547 | 0     |     |

#### Saul Bell Rd. / Unser Blvd

(6)

3.0% Truck

Existing (2010)

2012 (NO BUILD - A.M.)

2012 (BUILD - A.M.)

| 0.85                      |      |       | 0.85                      |      |       | 0.90                    |       |       | 0.85                    |       |       | PHF |
|---------------------------|------|-------|---------------------------|------|-------|-------------------------|-------|-------|-------------------------|-------|-------|-----|
| Eastbound (Saul Bell Rd.) |      |       | Westbound (Saul Bell Rd.) |      |       | Northbound (Unser Blvd) |       |       | Southbound (Unser Blvd) |       |       |     |
| Left                      | Thru | Right | Left                      | Thru | Right | Left                    | Thru  | Right | Left                    | Thru  | Right |     |
| 0                         | 0    | 6     | 0                         | 0    | 0     | 0                       | 0     | 0     | 0                       | 0     | 11    |     |
| 0                         | 0    | 6     | 0                         | 0    | 0     | 0                       | 1,424 | 0     | 0                       | 1,708 | 12    |     |
| 0                         | 0    | 8     | 0                         | 0    | 0     | 42                      | 1,445 | 0     | 0                       | 1,770 | 12    |     |

Existing (2010)

2012 (NO BUILD - P.M.)

2012 (BUILD - P.M.)

| 0.85                      |      |       | 0.85                      |      |       | 0.91                    |       |       | 0.92                    |       |       | PHF |
|---------------------------|------|-------|---------------------------|------|-------|-------------------------|-------|-------|-------------------------|-------|-------|-----|
| Eastbound (Saul Bell Rd.) |      |       | Westbound (Saul Bell Rd.) |      |       | Northbound (Unser Blvd) |       |       | Southbound (Unser Blvd) |       |       |     |
| Left                      | Thru | Right | Left                      | Thru | Right | Left                    | Thru  | Right | Left                    | Thru  | Right |     |
| 0                         | 0    | 6     | 0                         | 0    | 0     | 0                       | 0     | 0     | 0                       | 0     | 7     |     |
| 0                         | 0    | 6     | 0                         | 0    | 0     | 0                       | 1,332 | 0     | 0                       | 1,359 | 7     |     |
| 0                         | 0    | 8     | 0                         | 0    | 0     | 55                      | 1,344 | 0     | 0                       | 1,424 | 7     |     |

#### Los Volcanes Rd / Driveway 'A'

(7)

3.0% Truck

Existing (2010)

2012 (NO BUILD - A.M.)

2012 (BUILD - A.M.)

| 0.93                        |      |       | 0.93                        |      |       | 0.85                      |      |       | 0.85                      |      |       | PHF |
|-----------------------------|------|-------|-----------------------------|------|-------|---------------------------|------|-------|---------------------------|------|-------|-----|
| Eastbound (Los Volcanes Rd) |      |       | Westbound (Los Volcanes Rd) |      |       | Northbound (Driveway 'A') |      |       | Southbound (Driveway 'A') |      |       |     |
| Left                        | Thru | Right | Left                        | Thru | Right | Left                      | Thru | Right | Left                      | Thru | Right |     |
| 0                           | 302  | 0     | 0                           | 260  | 0     | 0                         | 0    | 0     | 0                         | 0    | 0     |     |
| 0                           | 325  | 0     | 0                           | 280  | 0     | 0                         | 0    | 0     | 0                         | 0    | 0     |     |
| 0                           | 339  | 5     | 37                          | 280  | 0     | 19                        | 0    | 0     | 0                         | 0    | 0     |     |

Existing (2010)

2012 (NO BUILD - P.M.)

2012 (BUILD - P.M.)

| 0.89                        |      |       | 0.89                        |      |       | 0.85                      |      |       | 0.85                      |      |       | PHF |
|-----------------------------|------|-------|-----------------------------|------|-------|---------------------------|------|-------|---------------------------|------|-------|-----|
| Eastbound (Los Volcanes Rd) |      |       | Westbound (Los Volcanes Rd) |      |       | Northbound (Driveway 'A') |      |       | Southbound (Driveway 'A') |      |       |     |
| Left                        | Thru | Right | Left                        | Thru | Right | Left                      | Thru | Right | Left                      | Thru | Right |     |
| 0                           | 128  | 0     | 0                           | 138  | 0     | 0                         | 0    | 0     | 0                         | 0    | 0     |     |
| 0                           | 161  | 0     | 0                           | 170  | 0     | 0                         | 0    | 0     | 0                         | 0    | 0     |     |
| 0                           | 176  | 5     | 46                          | 170  | 0     | 20                        | 0    | 0     | 0                         | 0    | 0     |     |

#### Los Volcanes Rd / Driveway 'B'

(8)

3.0% Truck

Existing (2010)

2012 (NO BUILD - A.M.)

2012 (BUILD - A.M.)

| 0.93                        |      |       | 0.93                        |      |       | 0.85                      |      |       | 0.85                      |      |       | PHF |
|-----------------------------|------|-------|-----------------------------|------|-------|---------------------------|------|-------|---------------------------|------|-------|-----|
| Eastbound (Los Volcanes Rd) |      |       | Westbound (Los Volcanes Rd) |      |       | Northbound (Driveway 'B') |      |       | Southbound (Driveway 'B') |      |       |     |
| Left                        | Thru | Right | Left                        | Thru | Right | Left                      | Thru | Right | Left                      | Thru | Right |     |
| 0                           | 302  | 0     | 0                           | 260  | 0     | 0                         | 0    | 0     | 0                         | 0    | 0     |     |
| 0                           | 325  | 0     | 0                           | 280  | 0     | 0                         | 0    | 0     | 0                         | 0    | 0     |     |
| 0                           | 325  | 14    | 0                           | 317  | 0     | 0                         | 0    | 37    | 0                         | 0    | 0     |     |

Existing (2010)

2012 (NO BUILD - P.M.)

2012 (BUILD - P.M.)

| 0.89                        |      |       | 0.89                        |      |       | 0.85                      |      |       | 0.85                      |      |       | PHF |
|-----------------------------|------|-------|-----------------------------|------|-------|---------------------------|------|-------|---------------------------|------|-------|-----|
| Eastbound (Los Volcanes Rd) |      |       | Westbound (Los Volcanes Rd) |      |       | Northbound (Driveway 'B') |      |       | Southbound (Driveway 'B') |      |       |     |
| Left                        | Thru | Right | Left                        | Thru | Right | Left                      | Thru | Right | Left                      | Thru | Right |     |
| 0                           | 128  | 0     | 0                           | 138  | 0     | 0                         | 0    | 0     | 0                         | 0    | 0     |     |
| 0                           | 161  | 0     | 0                           | 170  | 0     | 0                         | 0    | 0     | 0                         | 0    | 0     |     |
| 0                           | 161  | 15    | 0                           | 216  | 0     | 0                         | 0    | 57    | 0                         | 0    | 0     |     |

*Valero Commercial Development (Los Volcanes Rd / Unser Blvd)*

Projected Turning Movements SUMMARY  
PROPOSED DEVELOPMENT (2012) - 100% Development

INTERSECTION:      **S u m m a r y**

Driveway "C" / Unser Blvd

(9)

3.0% Truck

Existing (2010)

2012 (NO BUILD - A.M.)

2012 (BUILD - A.M.)

| 0.85                     |      |       | 0.85                     |      |       | 0.90                    |       |       | 0.90                    |       |       | PHF |
|--------------------------|------|-------|--------------------------|------|-------|-------------------------|-------|-------|-------------------------|-------|-------|-----|
| Eastbound (Driveway "C") |      |       | Westbound (Driveway "C") |      |       | Northbound (Unser Blvd) |       |       | Southbound (Unser Blvd) |       |       |     |
| Left                     | Thru | Right | Left                     | Thru | Right | Left                    | Thru  | Right | Left                    | Thru  | Right |     |
| 0                        | 0    | 0     | 0                        | 0    | 0     | 0                       | 0     | 0     | 0                       | 0     | 0     | 0   |
| 0                        | 0    | 0     | 0                        | 0    | 0     | 0                       | 1,424 | 0     | 0                       | 1,708 | 0     | 0   |
| 0                        | 0    | 41    | 0                        | 0    | 0     | 0                       | 1,445 | 0     | 0                       | 1,729 | 0     | 0   |

Existing (2010)

2012 (NO BUILD - P.M.)

2012 (BUILD - P.M.)

| 0.85                     |      |       | 0.85                     |      |       | 0.91                    |       |       | 0.91                    |       |       | PHF |
|--------------------------|------|-------|--------------------------|------|-------|-------------------------|-------|-------|-------------------------|-------|-------|-----|
| Eastbound (Driveway "C") |      |       | Westbound (Driveway "C") |      |       | Northbound (Unser Blvd) |       |       | Southbound (Unser Blvd) |       |       |     |
| Left                     | Thru | Right | Left                     | Thru | Right | Left                    | Thru  | Right | Left                    | Thru  | Right |     |
| 0                        | 0    | 0     | 0                        | 0    | 0     | 0                       | 0     | 0     | 0                       | 0     | 0     | 0   |
| 0                        | 0    | 0     | 0                        | 0    | 0     | 0                       | 1,332 | 0     | 0                       | 1,359 | 0     | 0   |
| 0                        | 0    | 52    | 0                        | 0    | 0     | 0                       | 1,344 | 0     | 0                       | 1,372 | 4     | 4   |

**Valero Commercial Development (Los Volcanes Rd / Unser Blvd)**  
**Projected Turning Movements Worksheet**  
**Los Volcanes Rd / Unser Blvd**

**INTERSECTION:** E-W Street: Los Volcanes Rd (1)  
 N-S Street: Unser Blvd

Year of Existing Counts 2010  
 Implementation Year 2012

Growth Rates

|                                              | 3.00%                       |        |        | 3.00%                       |        |       | 3.00%                   |       |       | 3.00%                   |       |       |
|----------------------------------------------|-----------------------------|--------|--------|-----------------------------|--------|-------|-------------------------|-------|-------|-------------------------|-------|-------|
|                                              | Eastbound (Los Volcanes Rd) |        |        | Westbound (Los Volcanes Rd) |        |       | Northbound (Unser Blvd) |       |       | Southbound (Unser Blvd) |       |       |
|                                              | Left                        | Thru   | Right  | Left                        | Thru   | Right | Left                    | Thru  | Right | Left                    | Thru  | Right |
| Existing Volumes                             | 172                         | 119    | 11     | 58                          | 29     | 136   | 23                      | 1,156 | 115   | 405                     | 1,511 | 208   |
| Background Traffic Growth                    | 10                          | 7      | 1      | 3                           | 2      | 8     | 1                       | 69    | 7     | 24                      | 91    | 12    |
| Subtotal                                     | 182                         | 126    | 12     | 61                          | 31     | 144   | 24                      | 1,225 | 122   | 429                     | 1,602 | 220   |
| Unser Town Center Trips Generated            | 0                           | 1      | 0      | 32                          | 1      | 8     | 0                       | 18    | 24    | 33                      | 0     | 0     |
| Unser Crossing Trips Generated               | 0                           | 0      | 0      | 1                           | 0      | 0     | 0                       | 10    | 1     | 0                       | 12    | 0     |
| Subtotal (NO BUILD - A.M.)                   | 182                         | 127    | 12     | 94                          | 32     | 152   | 24                      | 1,253 | 147   | 462                     | 1,614 | 220   |
| Percent Commercial Trips Generated(Entering) | 0.00%                       | 0.00%  | 0.00%  | 0.00%                       | 16.03% | 0.00% | 20.49%                  | 0.00% | 0.00% | 0.00%                   | 0.00% | 0.00% |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                       | 16.03% | 20.49% | 0.00%                       | 0.00%  | 0.00% | 0.00%                   | 0.00% | 0.00% | 0.00%                   | 0.00% | 0.00% |
| Total Trips Generated                        | 0                           | 16     | 21     | 0                           | 16     | 0     | 21                      | 0     | 0     | 0                       | 0     | 0     |
| Total AM Peak Hour BUILD Volumes             | 182                         | 143    | 33     | 94                          | 48     | 152   | 45                      | 1,253 | 147   | 462                     | 1,614 | 220   |

|                                              | 9.02%                       |        |        | 3.00%                       |        |       | 4.08%                   |       |       | 1.21%                   |       |       |
|----------------------------------------------|-----------------------------|--------|--------|-----------------------------|--------|-------|-------------------------|-------|-------|-------------------------|-------|-------|
|                                              | Eastbound (Los Volcanes Rd) |        |        | Westbound (Los Volcanes Rd) |        |       | Northbound (Unser Blvd) |       |       | Southbound (Unser Blvd) |       |       |
|                                              | Left                        | Thru   | Right  | Left                        | Thru   | Right | Left                    | Thru  | Right | Left                    | Thru  | Right |
| Existing Volumes                             | 96                          | 16     | 16     | 68                          | 20     | 209   | 10                      | 1,045 | 83    | 141                     | 1,147 | 108   |
| Background Traffic Growth                    | 17                          | 3      | 3      | 4                           | 1      | 13    | 1                       | 85    | 7     | 3                       | 28    | 3     |
| Subtotal                                     | 113                         | 19     | 19     | 72                          | 21     | 222   | 11                      | 1,130 | 90    | 144                     | 1,175 | 111   |
| Unser Town Center Trips Generated            | 0                           | 2      | 0      | 106                         | 2      | 47    | 0                       | 32    | 45    | 79                      | -29   | 0     |
| Unser Crossing Trips Generated               | 0                           | 0      | 0      | 2                           | 0      | 0     | 0                       | 22    | 2     | 0                       | 21    | 0     |
| Subtotal (NO BUILD - P.M.)                   | 113                         | 21     | 19     | 180                         | 23     | 269   | 11                      | 1,184 | 137   | 223                     | 1,167 | 111   |
| Percent Commercial Trips Generated(Entering) | 0.00%                       | 0.00%  | 0.00%  | 0.00%                       | 16.03% | 0.00% | 20.49%                  | 0.00% | 0.00% | 0.00%                   | 0.00% | 0.00% |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                       | 16.03% | 20.49% | 0.00%                       | 0.00%  | 0.00% | 0.00%                   | 0.00% | 0.00% | 0.00%                   | 0.00% | 0.00% |
| Total Trips Generated                        | 0                           | 17     | 22     | 0                           | 17     | 0     | 22                      | 0     | 0     | 0                       | 0     | 0     |
| Subtotal PM Pk Hr. BUILD Volumes             | 113                         | 38     | 41     | 180                         | 40     | 269   | 33                      | 1,184 | 137   | 223                     | 1,167 | 111   |
| Pass-by Trip Adjustments                     | 13                          | 0      | 5      | 0                           | 0      | 0     | 3                       | -13   | 0     | 0                       | -4    | 4     |
| Total PM Peak Hour BUILD Volumes             | 126                         | 38     | 46     | 180                         | 40     | 269   | 36                      | 1,171 | 137   | 223                     | 1,163 | 115   |

Number of Commercial Trips Generated  
 Entering 102 Exiting 107  
 A.M. 100% Commercial Development  
 P.M.

**Pass-by Trip Calculations:**

|                     | Eastbound (Los Volcanes Rd) |       |        | Westbound (Los Volcanes Rd) |       |       | Northbound (Unser Blvd) |         |       | Southbound (Unser Blvd) |         |        |
|---------------------|-----------------------------|-------|--------|-----------------------------|-------|-------|-------------------------|---------|-------|-------------------------|---------|--------|
|                     | 0.00%                       | 0.00% | 0.00%  | 0.00%                       | 0.00% | 0.00% | 10.00%                  | -48.00% | 0.00% | 0.00%                   | -16.00% | 16.00% |
| PM Pass-by Trips    | 0                           | 0     | 0      | 0                           | 0     | 0     | 3                       | -13     | 0     | 0                       | -4      | 4      |
| Percent Entering    | 48.00%                      | 0.00% | 20.00% | 0.00%                       | 0.00% | 0.00% | 0.00%                   | 0.00%   | 0.00% | 0.00%                   | 0.00%   | 0.00%  |
| Volume Entering     | 13                          | 0     | 5      | 0                           | 0     | 0     | 0                       | 0       | 0     | 0                       | 0       | 0      |
| Percent Exiting     | 13                          | 0     | 5      | 0                           | 0     | 0     | 3                       | -13     | 0     | 0                       | -4      | 4      |
| Volume Exiting      | 13                          | 0     | 5      | 0                           | 0     | 0     | 3                       | -13     | 0     | 0                       | -4      | 4      |
| Net PM Passby Trips | 13                          | 0     | 5      | 0                           | 0     | 0     | 3                       | -13     | 0     | 0                       | -4      | 4      |
| Pass-by Trips       | 0                           | 0     | 0      | 0                           | 0     | 0     | 0                       | 0       | 0     | 0                       | 0       | 0      |
|                     | 27                          | 0     | 0      | 0                           | 0     | 0     | 0                       | 0       | 0     | 0                       | 0       | 0      |

**Trips Generated by Other Approved Projects**

|                     | Eastbound (Los Volcanes Rd) |    |   | Westbound (Los Volcanes Rd) |    |     | Northbound (Unser Blvd) |     |     | Southbound (Unser Blvd) |      |   |
|---------------------|-----------------------------|----|---|-----------------------------|----|-----|-------------------------|-----|-----|-------------------------|------|---|
| AM Peak Hr. Volumes | 0                           | 5  | 0 | 202                         | 4  | 51  | 0                       | 115 | 152 | 207                     | 0    | 0 |
| Unser Town Center   | 0                           | 0  | 0 | 7                           | 0  | 0   | 0                       | 65  | 6   | 0                       | 76   | 0 |
| Unser Crossing      | 0                           | 0  | 0 | 0                           | 0  | 0   | 0                       | 0   | 0   | 0                       | 0    | 0 |
| PM Peak Hr. Volumes | 0                           | 10 | 0 | 663                         | 10 | 293 | 0                       | 203 | 283 | 496                     | -179 | 0 |
| Unser Town Center   | 0                           | 0  | 0 | 12                          | 0  | 0   | 0                       | 135 | 12  | 0                       | 133  | 0 |
| Unser Crossing      | 0                           | 0  | 0 | 0                           | 0  | 0   | 0                       | 0   | 0   | 0                       | 0    | 0 |

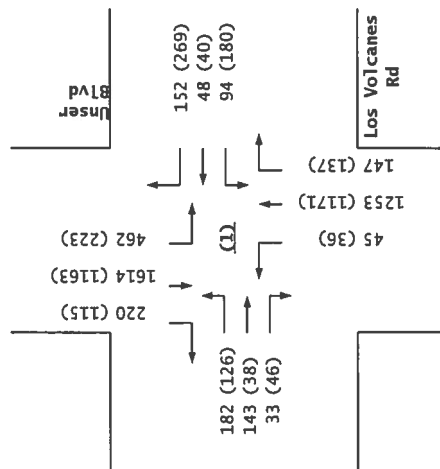
\* - Unser Town Center Volumes from I-40 / Unser Commercial Development TIS (May 5, 2008)

\* - Unser Crossing Volumes from Unser Crossing TIS (March 31, 2008)

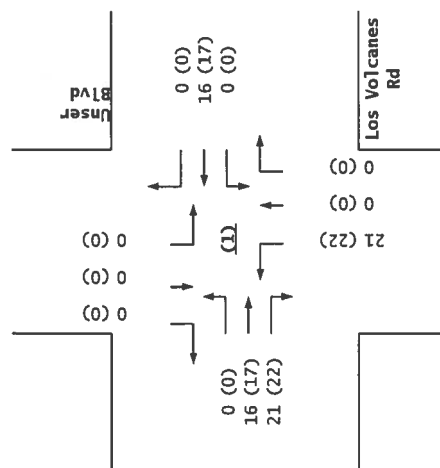
NOTE: Assume 16% development of Unser Town Center and Unser Crossing by 2012.

16%

2012  
BUILD



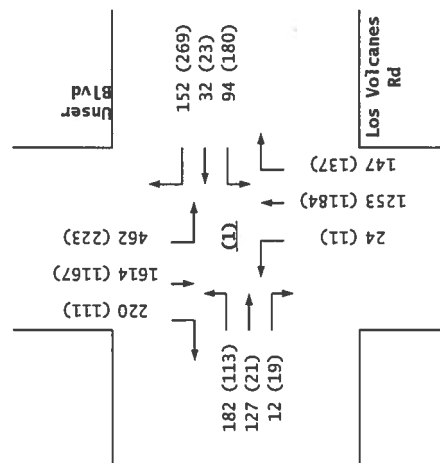
Trips



Los Volcanes Rd / Unser Blvd

Case "Y"

2012  
NO BUILD



**Valero Commercial Development (Los Volcanes Rd / Unser Blvd)**  
**Projected Turning Movements Worksheet**  
**Bluewater Rd. / Unser Blvd**

**INTERSECTION :** E-W Street: Bluewater Rd. (2)  
 N-S Street: Unser Blvd  
 Year of Existing Counts 2010  
 Implementation Year 2012  
 Growth Rates

|                                              | 1.53%                     |       |       | 3.00%                     |       |        | 3.00%                   |        |       | 4.37%                   |        |       |
|----------------------------------------------|---------------------------|-------|-------|---------------------------|-------|--------|-------------------------|--------|-------|-------------------------|--------|-------|
|                                              | Eastbound (Bluewater Rd.) |       |       | Westbound (Bluewater Rd.) |       |        | Northbound (Unser Blvd) |        |       | Southbound (Unser Blvd) |        |       |
|                                              | Left                      | Thru  | Right | Left                      | Thru  | Right  | Left                    | Thru   | Right | Left                    | Thru   | Right |
| Existing Volumes                             | 177                       | 79    | 81    | 45                        | 46    | 52     | 70                      | 1,233  | 89    | 148                     | 704    | 97    |
| Background Traffic Growth                    | 5                         | 2     | 2     | 3                         | 3     | 3      | 4                       | 74     | 5     | 13                      | 61     | 8     |
| Subtotal                                     | 182                       | 81    | 83    | 48                        | 49    | 55     | 74                      | 1,307  | 94    | 161                     | 765    | 105   |
| Unser Town Center Trips Generated            | 2                         | 0     | 0     | 0                         | 0     | 0      | 0                       | 41     | 0     | 0                       | 31     | 1     |
| Unser Crossing Trips Generated               | 0                         | 0     | 1     | 0                         | 0     | 0      | 1                       | 11     | 0     | 0                       | 13     | 0     |
| Subtotal (NO BUILD - A.M.)                   | 184                       | 81    | 84    | 48                        | 49    | 55     | 75                      | 1,359  | 94    | 161                     | 809    | 106   |
| Percent Commercial Trips Generated(Entering) | 0.00%                     | 0.00% | 0.00% | 0.00%                     | 0.00% | 14.49% | 0.00%                   | 47.61% | 0.00% | 0.00%                   | 0.00%  | 0.00% |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                     | 0.00% | 0.00% | 0.00%                     | 0.00% | 0.00%  | 0.00%                   | 0.00%  | 0.00% | 14.49%                  | 47.61% | 0.00% |
| Total Trips Generated                        | 0                         | 0     | 0     | 0                         | 0     | 15     | 0                       | 49     | 0     | 15                      | 49     | 0     |
| Total AM Peak Hour BUILD Volumes             | 184                       | 81    | 84    | 48                        | 49    | 70     | 75                      | 1,408  | 94    | 176                     | 858    | 106   |

|                                              | 4.37%                     |       |       | 2.99%                     |       |        | 5.04%                   |        |       | 0.90%                   |        |       |
|----------------------------------------------|---------------------------|-------|-------|---------------------------|-------|--------|-------------------------|--------|-------|-------------------------|--------|-------|
|                                              | Eastbound (Bluewater Rd.) |       |       | Westbound (Bluewater Rd.) |       |        | Northbound (Unser Blvd) |        |       | Southbound (Unser Blvd) |        |       |
|                                              | Left                      | Thru  | Right | Left                      | Thru  | Right  | Left                    | Thru   | Right | Left                    | Thru   | Right |
| Existing Volumes                             | 97                        | 53    | 57    | 91                        | 89    | 183    | 63                      | 865    | 28    | 85                      | 1,100  | 124   |
| Background Traffic Growth                    | 8                         | 5     | 5     | 5                         | 5     | 11     | 6                       | 87     | 3     | 2                       | 20     | 2     |
| Subtotal                                     | 105                       | 58    | 62    | 96                        | 94    | 194    | 69                      | 952    | 31    | 87                      | 1,120  | 126   |
| Unser Town Center Trips Generated            | 4                         | 0     | 0     | 0                         | 0     | 0      | 0                       | 74     | 0     | 0                       | 74     | 4     |
| Unser Crossing Trips Generated               | 0                         | 0     | 1     | 0                         | 0     | 0      | 1                       | 24     | 0     | 0                       | 23     | 0     |
| Subtotal (NO BUILD - P.M.)                   | 109                       | 58    | 63    | 96                        | 94    | 194    | 70                      | 1,050  | 31    | 87                      | 1,217  | 130   |
| Percent Commercial Trips Generated(Entering) | 0.00%                     | 0.00% | 0.00% | 0.00%                     | 0.00% | 14.49% | 0.00%                   | 47.61% | 0.00% | 0.00%                   | 0.00%  | 0.00% |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                     | 0.00% | 0.00% | 0.00%                     | 0.00% | 0.00%  | 0.00%                   | 0.00%  | 0.00% | 14.49%                  | 47.61% | 0.00% |
| Total Trips Generated                        | 0                         | 0     | 0     | 0                         | 0     | 16     | 0                       | 51     | 0     | 16                      | 51     | 0     |
| Total PM Peak Hour BUILD Volumes             | 109                       | 58    | 63    | 96                        | 94    | 210    | 70                      | 1,101  | 31    | 103                     | 1,268  | 130   |

Number of Commercial Trips Generated

|          |     |         |     |      |                             |
|----------|-----|---------|-----|------|-----------------------------|
| Entering | 102 | Exiting | 102 | A.M. | 100% Commercial Development |
|          | 107 |         | 107 | P.M. |                             |

|                          | Eastbound (Bluewater Rd.) |    |    | Westbound (Bluewater Rd.) |    |     | Northbound (Unser Blvd) |       |    | Southbound (Unser Blvd) |       |     |
|--------------------------|---------------------------|----|----|---------------------------|----|-----|-------------------------|-------|----|-------------------------|-------|-----|
| 2010 AM Peak Hr. Volumes | 177                       | 79 | 81 | 45                        | 46 | 52  | 70                      | 1,233 | 89 | 148                     | 704   | 97  |
| 2010 PM Peak Hr. Volumes | 97                        | 53 | 57 | 91                        | 89 | 183 | 63                      | 865   | 28 | 85                      | 1,100 | 124 |

**Trips Generated by Other Approved Projects**

| AM Peak Hr. Volumes | Eastbound (Bluewater Rd.) |   |   | Westbound (Bluewater Rd.) |   |   | Northbound (Unser Blvd) |     |   | Southbound (Unser Blvd) |     |    |
|---------------------|---------------------------|---|---|---------------------------|---|---|-------------------------|-----|---|-------------------------|-----|----|
| Unser Town Center   | 12                        | 0 | 0 | 0                         | 0 | 0 | 0                       | 255 | 0 | 0                       | 193 | 9  |
| Unser Crossing      | 0                         | 0 | 4 | 1                         | 0 | 0 | 4                       | 70  | 1 | 0                       | 83  | 0  |
| PM Peak Hr. Volumes | Eastbound (Bluewater Rd.) |   |   | Westbound (Bluewater Rd.) |   |   | Northbound (Unser Blvd) |     |   | Southbound (Unser Blvd) |     |    |
| Unser Town Center   | 23                        | 0 | 0 | 0                         | 0 | 0 | 0                       | 464 | 0 | 0                       | 462 | 22 |
| Unser Crossing      | 0                         | 0 | 7 | 2                         | 0 | 0 | 7                       | 147 | 2 | 0                       | 145 | 0  |

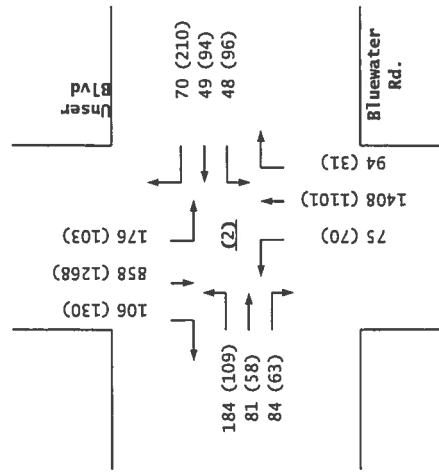
\* - Unser Town Center Volumes from I-40 / Unser Commercial Development TIS (May 5, 2008)

\* - Unser Crossing Volumes from Unser Crossing TIS (March 31, 2008)

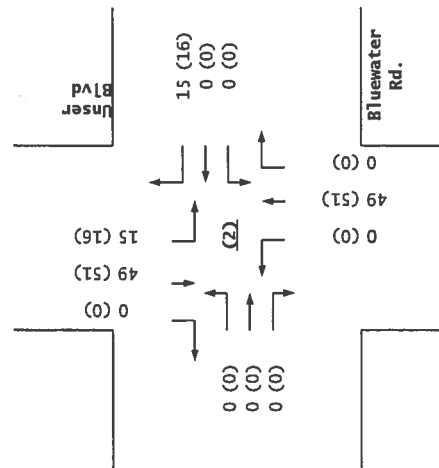
NOTE: Assume 16% development of Unser Town Center and Unser Crossing by 2012.

16%

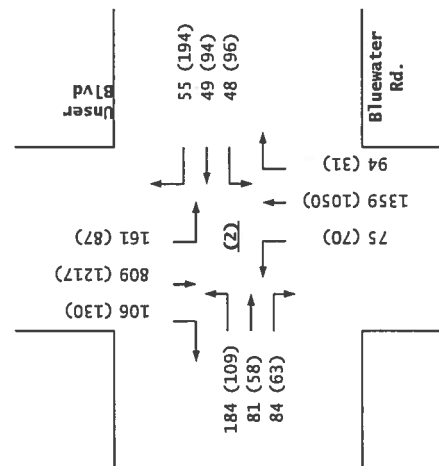
2012  
BUILD



Trips



2012  
NO BUILD



Bluewater Rd. / Unser Blvd

**Valero Commercial Development (Los Volcanes Rd / Unser Blvd)**

## Projected Turning Movements Worksheet

**Central Ave / Unser Blvd**

INTERSECTION: E-W Street: **Central Ave** (3) Trip assignments only  
 N-S Street: **Unser Blvd**

**AM Peak Hour Volumes Generated**

Percent Commercial Trips Generated(Entering)  
 Percent Commercial Trips Generated(Exiting)

Total Trips Generated

| Eastbound (Central Ave) |       |       | Westbound (Central Ave) |       |        | Northbound (Unser Blvd) |        |       | Southbound (Unser Blvd) |        |        |
|-------------------------|-------|-------|-------------------------|-------|--------|-------------------------|--------|-------|-------------------------|--------|--------|
| Left                    | Thru  | Right | Left                    | Thru  | Right  | Left                    | Thru   | Right | Left                    | Thru   | Right  |
| 22.22%                  | 0.00% | 0.00% | 0.00%                   | 0.00% | 15.32% | 0.00%                   | 10.07% | 0.00% | 0.00%                   | 0.00%  | 0.00%  |
| 0.00%                   | 0.00% | 0.00% | 0.00%                   | 0.00% | 0.00%  | 0.00%                   | 0.00%  | 0.00% | 15.32%                  | 10.07% | 22.22% |
| 23                      | 0     | 0     | 0                       | 0     | 16     | 0                       | 10     | 0     | 16                      | 10     | 23     |

**PM Peak Hour Volumes Generated**

Percent Commercial Trips Generated(Entering)  
 Percent Commercial Trips Generated(Exiting)

Total Trips Generated

| 3.00% Eastbound (Central Ave) |       |       | 3.00% Westbound (Central Ave) |       |        | 3.00% Northbound (Unser Blvd) |        |       | 3.00% Southbound (Unser Blvd) |        |        |
|-------------------------------|-------|-------|-------------------------------|-------|--------|-------------------------------|--------|-------|-------------------------------|--------|--------|
| Left                          | Thru  | Right | Left                          | Thru  | Right  | Left                          | Thru   | Right | Left                          | Thru   | Right  |
| 22.22%                        | 0.00% | 0.00% | 0.00%                         | 0.00% | 15.32% | 0.00%                         | 10.07% | 0.00% | 0.00%                         | 0.00%  | 0.00%  |
| 0.00%                         | 0.00% | 0.00% | 0.00%                         | 0.00% | 0.00%  | 0.00%                         | 0.00%  | 0.00% | 15.32%                        | 10.07% | 22.22% |
| 24                            | 0     | 0     | 0                             | 0     | 16     | 0                             | 11     | 0     | 16                            | 11     | 24     |

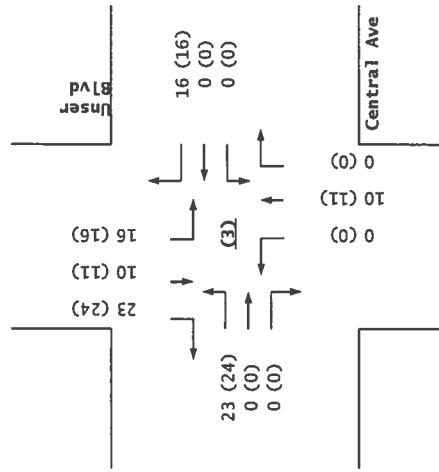
Number of Commercial Trips Generated

Entering Exiting  
 102 102 A.M. 100% Commercial Development  
 107 107 P.M.

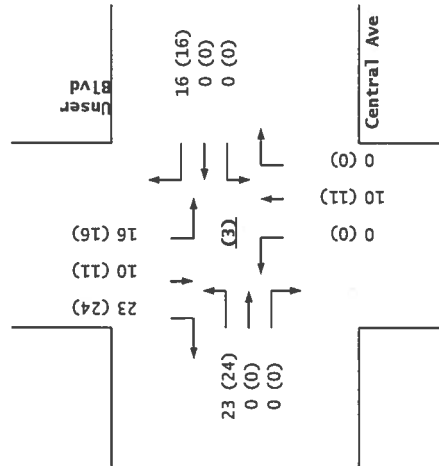
2010 AM Peak Hr. Volumes  
 2010 PM Peak Hr. Volumes

| Eastbound (Central Ave) |   |   | Westbound (Central Ave) |   |   | Northbound (Unser Blvd) |   |   | Southbound (Unser Blvd) |   |   |
|-------------------------|---|---|-------------------------|---|---|-------------------------|---|---|-------------------------|---|---|
| 0                       | 0 | 0 | 0                       | 0 | 0 | 0                       | 0 | 0 | 0                       | 0 | 0 |
| 0                       | 0 | 0 | 0                       | 0 | 0 | 0                       | 0 | 0 | 0                       | 0 | 0 |

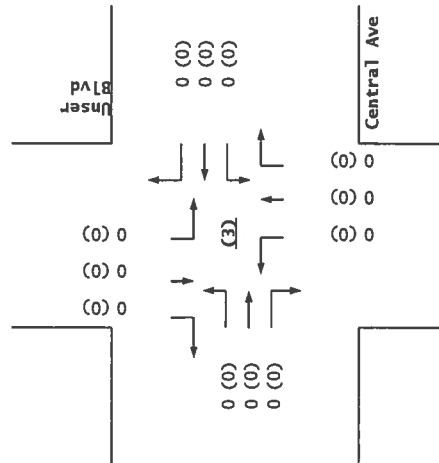
2012  
BUILD



Trips



2012  
NO BUILD



Central Ave / Unser Blvd

**Valero Commercial Development (Los Volcanes Rd / Unser Blvd)**  
**Projected Turning Movements Worksheet**  
**I-40 N. Ramp / Unser Blvd**

**INTERSECTION:** E-W Street: I-40 N. Ramp (4)  
 N-S Street: Unser Blvd

Year of Existing Counts 2010  
 Implementation Year 2012

|                                              | 3.00%                    |          |          | 2.00%                    |          |          | 4.76%                   |            |          | 2.67%                   |              |          |
|----------------------------------------------|--------------------------|----------|----------|--------------------------|----------|----------|-------------------------|------------|----------|-------------------------|--------------|----------|
|                                              | Eastbound (I-40 N. Ramp) |          |          | Westbound (I-40 N. Ramp) |          |          | Northbound (Unser Blvd) |            |          | Southbound (Unser Blvd) |              |          |
|                                              | Left                     | Thru     | Right    | Left                     | Thru     | Right    | Left                    | Thru       | Right    | Left                    | Thru         | Right    |
| Existing Volumes                             | 0                        | 0        | 0        | 376                      | 0        | 0        | 33                      | 602        | 0        | 0                       | 2,222        | 0        |
| Background Traffic Growth                    | 0                        | 0        | 0        | 15                       | 0        | 0        | 3                       | 57         | 0        | 0                       | 119          | 0        |
| <b>Subtotal (NO BUILD - A.M.)</b>            | <b>0</b>                 | <b>0</b> | <b>0</b> | <b>391</b>               | <b>0</b> | <b>0</b> | <b>36</b>               | <b>659</b> | <b>0</b> | <b>0</b>                | <b>2,341</b> | <b>0</b> |
| Percent Commercial Trips Generated(Entering) | 0.00%                    | 0.00%    | 0.00%    | 0.00%                    | 0.00%    | 0.00%    | 0.00%                   | 0.00%      | 0.00%    | 0.00%                   | 0.00%        | 0.00%    |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                    | 0.00%    | 0.00%    | 0.00%                    | 0.00%    | 0.00%    | 0.00%                   | 0.00%      | 0.00%    | 0.00%                   | 0.00%        | 0.00%    |
| Total Trips Generated                        | 0                        | 0        | 0        | 0                        | 0        | 0        | 0                       | 0          | 0        | 0                       | 0            | 0        |
| <b>Total AM Peak Hour BUILD Volumes</b>      | <b>0</b>                 | <b>0</b> | <b>0</b> | <b>391</b>               | <b>0</b> | <b>0</b> | <b>36</b>               | <b>659</b> | <b>0</b> | <b>0</b>                | <b>2,341</b> | <b>0</b> |

|                                              | 3.00%                    |          |          | 2.00%                    |          |          | 6.49%                   |              |          | 9.69%                   |              |          |
|----------------------------------------------|--------------------------|----------|----------|--------------------------|----------|----------|-------------------------|--------------|----------|-------------------------|--------------|----------|
|                                              | Eastbound (I-40 N. Ramp) |          |          | Westbound (I-40 N. Ramp) |          |          | Northbound (Unser Blvd) |              |          | Southbound (Unser Blvd) |              |          |
|                                              | Left                     | Thru     | Right    | Left                     | Thru     | Right    | Left                    | Thru         | Right    | Left                    | Thru         | Right    |
| Existing Volumes                             | 0                        | 0        | 0        | 921                      | 3        | 0        | 23                      | 915          | 0        | 0                       | 879          | 0        |
| Background Traffic Growth                    | 0                        | 0        | 0        | 37                       | 0        | 0        | 3                       | 119          | 0        | 0                       | 170          | 0        |
| <b>Subtotal (NO BUILD - P.M.)</b>            | <b>0</b>                 | <b>0</b> | <b>0</b> | <b>958</b>               | <b>3</b> | <b>0</b> | <b>26</b>               | <b>1,034</b> | <b>0</b> | <b>0</b>                | <b>1,049</b> | <b>0</b> |
| Percent Commercial Trips Generated(Entering) | 0.00%                    | 0.00%    | 0.00%    | 0.00%                    | 0.00%    | 0.00%    | 0.00%                   | 0.00%        | 0.00%    | 0.00%                   | 0.00%        | 0.00%    |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                    | 0.00%    | 0.00%    | 0.00%                    | 0.00%    | 0.00%    | 0.00%                   | 0.00%        | 0.00%    | 0.00%                   | 0.00%        | 0.00%    |
| Total Trips Generated                        | 0                        | 0        | 0        | 0                        | 0        | 0        | 0                       | 0            | 0        | 0                       | 0            | 0        |
| <b>Subtotal PM Pk Hr. BUILD Volumes</b>      | <b>0</b>                 | <b>0</b> | <b>0</b> | <b>958</b>               | <b>3</b> | <b>0</b> | <b>26</b>               | <b>1,034</b> | <b>0</b> | <b>0</b>                | <b>1,049</b> | <b>0</b> |
| Pass-by Trip Adjustments                     | 0                        | 0        | 0        | 0                        | 0        | 0        | 0                       | 0            | 0        | 0                       | 0            | 0        |
| <b>Total PM Peak Hour BUILD Volumes</b>      | <b>0</b>                 | <b>0</b> | <b>0</b> | <b>958</b>               | <b>3</b> | <b>0</b> | <b>26</b>               | <b>1,034</b> | <b>0</b> | <b>0</b>                | <b>1,049</b> | <b>0</b> |

Number of Commercial Trips Generated  
 Entering 102 102 A.M. 100% Commercial Development  
 Exiting 107 107 P.M.

|                          | Eastbound (I-40 N. Ramp) |   |   | Westbound (I-40 N. Ramp) |   |   | Northbound (Unser Blvd) |     |   | Southbound (Unser Blvd) |       |   |
|--------------------------|--------------------------|---|---|--------------------------|---|---|-------------------------|-----|---|-------------------------|-------|---|
| 2010 AM Peak Hr. Volumes | 0                        | 0 | 0 | 376                      | 0 | 0 | 33                      | 602 | 0 | 0                       | 2,222 | 0 |
| 2010 PM Peak Hr. Volumes | 0                        | 0 | 0 | 921                      | 3 | 0 | 23                      | 915 | 0 | 0                       | 879   | 0 |

**MRCOG Forecast Volumes Worksheet**

**Based on 2010 Traffic Count**

|                     |   |     |     |       |
|---------------------|---|-----|-----|-------|
| 2010 AM Link Volume | 0 | 376 | 635 | 2,222 |
| 2010 PM Link Volume | 0 | 924 | 938 | 879   |

**Based on MRCOG Model (2030 Data Set)**

|                     |   |      |      |      |
|---------------------|---|------|------|------|
| 2004 AM Link Volume | 0 | 589  | 493  | 2396 |
| 2004 PM Link Volume | 0 | 1447 | 1134 | 1763 |
| 2030 AM Link Volume | 0 | 528  | 1240 | 3408 |
| 2030 PM Link Volume | 0 | 1290 | 2156 | 2582 |

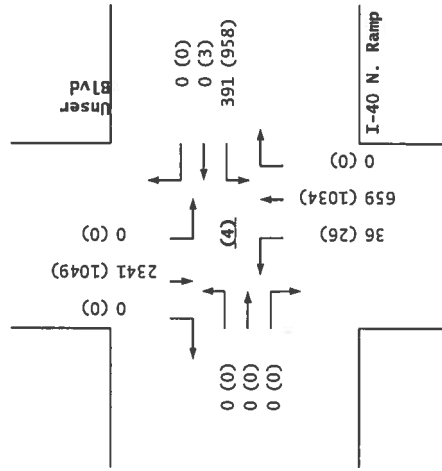
**Growth Rate to Apply to Existing Counts to Match 2030 Forecasts**

|                           |         |       |       |       |
|---------------------------|---------|-------|-------|-------|
| 2010-2030 AM Growth Rates | #DIV/0! | 2.02% | 4.76% | 2.67% |
| 2010-2030 PM Growth Rates | #DIV/0! | 1.98% | 6.49% | 9.69% |

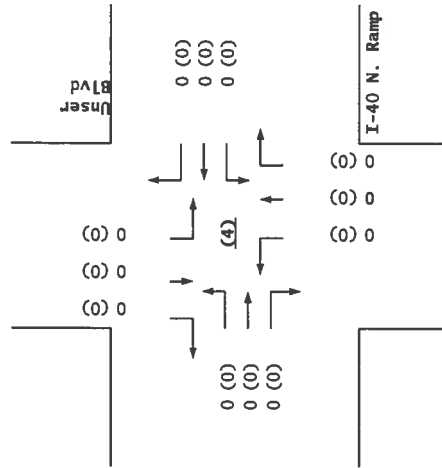
**Growth Rate to Apply to 2004 Model Volumes to Match 2030 Forecasts**

|                           |         |        |       |       |
|---------------------------|---------|--------|-------|-------|
| 2004-2030 AM Growth Rates | #DIV/0! | -0.40% | 5.83% | 1.62% |
| 2004-2030 PM Growth Rates | #DIV/0! | -0.42% | 3.47% | 1.79% |

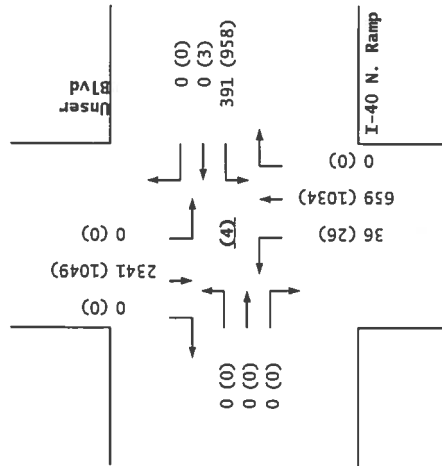
2012  
BUILD



Trips



2012  
NO BUILD



I-40 N. Ramp / Unser Blvd

**Valero Commercial Development (Los Volcanes Rd / Unser Blvd)**  
**Projected Turning Movements Worksheet**  
**I-40 S. Ramp / Unser Blvd**

INTERSECTION: E-W Street: I-40 S. Ramp (5)  
 N-S Street: Unser Blvd

Year of Existing Counts 2010  
 Implementation Year 2012

|                                              | 4.26%                    |          |           | 3.00%                    |          |          | 4.87%                   |            |          | 3.49%                   |              |          |
|----------------------------------------------|--------------------------|----------|-----------|--------------------------|----------|----------|-------------------------|------------|----------|-------------------------|--------------|----------|
|                                              | Eastbound (I-40 S. Ramp) |          |           | Westbound (I-40 S. Ramp) |          |          | Northbound (Unser Blvd) |            |          | Southbound (Unser Blvd) |              |          |
|                                              | Left                     | Thru     | Right     | Left                     | Thru     | Right    | Left                    | Thru       | Right    | Left                    | Thru         | Right    |
| Existing Volumes                             | 82                       | 0        | 40        | 0                        | 0        | 0        | 0                       | 628        | 0        | 0                       | 2,124        | 0        |
| Background Traffic Growth                    | 7                        | 0        | 3         | 0                        | 0        | 0        | 0                       | 61         | 0        | 0                       | 148          | 0        |
| <b>Subtotal (NO BUILD - A.M.)</b>            | <b>89</b>                | <b>0</b> | <b>43</b> | <b>0</b>                 | <b>0</b> | <b>0</b> | <b>0</b>                | <b>689</b> | <b>0</b> | <b>0</b>                | <b>2,272</b> | <b>0</b> |
| Percent Commercial Trips Generated(Entering) | 0.00%                    | 0.00%    | 0.00%     | 0.00%                    | 0.00%    | 0.00%    | 0.00%                   | 0.00%      | 0.00%    | 0.00%                   | 0.00%        | 0.00%    |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                    | 0.00%    | 0.00%     | 0.00%                    | 0.00%    | 0.00%    | 0.00%                   | 0.00%      | 0.00%    | 0.00%                   | 0.00%        | 0.00%    |
| Total Trips Generated                        | 0                        | 0        | 0         | 0                        | 0        | 0        | 0                       | 0          | 0        | 0                       | 0            | 0        |
| <b>Total AM Peak Hour BUILD Volumes</b>      | <b>89</b>                | <b>0</b> | <b>43</b> | <b>0</b>                 | <b>0</b> | <b>0</b> | <b>0</b>                | <b>689</b> | <b>0</b> | <b>0</b>                | <b>2,272</b> | <b>0</b> |

|                                              | 4.88%                    |          |           | 3.00%                    |          |          | 6.49%                   |              |          | 4.02%                   |              |          |
|----------------------------------------------|--------------------------|----------|-----------|--------------------------|----------|----------|-------------------------|--------------|----------|-------------------------|--------------|----------|
|                                              | Eastbound (I-40 S. Ramp) |          |           | Westbound (I-40 S. Ramp) |          |          | Northbound (Unser Blvd) |              |          | Southbound (Unser Blvd) |              |          |
|                                              | Left                     | Thru     | Right     | Left                     | Thru     | Right    | Left                    | Thru         | Right    | Left                    | Thru         | Right    |
| Existing Volumes                             | 122                      | 0        | 47        | 0                        | 0        | 0        | 0                       | 938          | 0        | 0                       | 1,432        | 0        |
| Background Traffic Growth                    | 12                       | 0        | 5         | 0                        | 0        | 0        | 0                       | 122          | 0        | 0                       | 115          | 0        |
| <b>Subtotal (NO BUILD - P.M.)</b>            | <b>134</b>               | <b>0</b> | <b>52</b> | <b>0</b>                 | <b>0</b> | <b>0</b> | <b>0</b>                | <b>1,060</b> | <b>0</b> | <b>0</b>                | <b>1,547</b> | <b>0</b> |
| Percent Commercial Trips Generated(Entering) | 0.00%                    | 0.00%    | 0.00%     | 0.00%                    | 0.00%    | 0.00%    | 0.00%                   | 0.00%        | 0.00%    | 0.00%                   | 0.00%        | 0.00%    |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                    | 0.00%    | 0.00%     | 0.00%                    | 0.00%    | 0.00%    | 0.00%                   | 0.00%        | 0.00%    | 0.00%                   | 0.00%        | 0.00%    |
| Total Trips Generated                        | 0                        | 0        | 0         | 0                        | 0        | 0        | 0                       | 0            | 0        | 0                       | 0            | 0        |
| <b>Subtotal PM Pk Hr. BUILD Volumes</b>      | <b>134</b>               | <b>0</b> | <b>52</b> | <b>0</b>                 | <b>0</b> | <b>0</b> | <b>0</b>                | <b>1,060</b> | <b>0</b> | <b>0</b>                | <b>1,547</b> | <b>0</b> |
| Pass-by Trip Adjustments                     | 0                        | 0        | 0         | 0                        | 0        | 0        | 0                       | 0            | 0        | 0                       | 0            | 0        |
| <b>Total PM Peak Hour BUILD Volumes</b>      | <b>134</b>               | <b>0</b> | <b>52</b> | <b>0</b>                 | <b>0</b> | <b>0</b> | <b>0</b>                | <b>1,060</b> | <b>0</b> | <b>0</b>                | <b>1,547</b> | <b>0</b> |

Number of Commercial Trips Generated  
 Entering 102 102 A.M. 100% Commercial Development  
 Exiting 107 107 P.M.

|                          | Eastbound (I-40 S. Ramp) |   |    | Westbound (I-40 S. Ramp) |   |   | Northbound (Unser Blvd) |     |   | Southbound (Unser Blvd) |       |   |
|--------------------------|--------------------------|---|----|--------------------------|---|---|-------------------------|-----|---|-------------------------|-------|---|
| 2010 AM Peak Hr. Volumes | 82                       | 0 | 40 | 0                        | 0 | 0 | 0                       | 628 | 0 | 0                       | 2,124 | 0 |
| 2010 PM Peak Hr. Volumes | 122                      | 0 | 47 | 0                        | 0 | 0 | 0                       | 938 | 0 | 0                       | 1,432 | 0 |

**MRCOG Forecast Volumes Worksheet**

**Based on 2010 Traffic Count**

|                     |     |   |     |       |
|---------------------|-----|---|-----|-------|
| 2010 AM Link Volume | 122 | 0 | 628 | 2,124 |
| 2010 PM Link Volume | 169 | 0 | 938 | 1,432 |

**Based on MRCOG Model (2030 Data Set)**

|                     |     |   |      |      |
|---------------------|-----|---|------|------|
| 2004 AM Link Volume | 42  | 0 | 493  | 2439 |
| 2004 PM Link Volume | 254 | 0 | 1134 | 2040 |
| 2030 AM Link Volume | 226 | 0 | 1240 | 3608 |
| 2030 PM Link Volume | 334 | 0 | 2156 | 2582 |

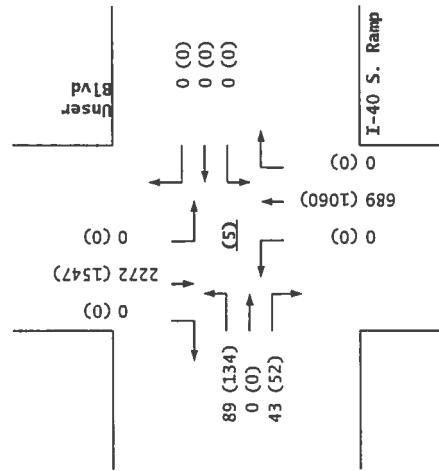
**Growth Rate to Apply to Existing Counts to Match 2030 Forecasts**

|                           |       |         |       |       |
|---------------------------|-------|---------|-------|-------|
| 2010-2030 AM Growth Rates | 4.26% | #DIV/0! | 4.87% | 3.49% |
| 2010-2030 PM Growth Rates | 4.88% | #DIV/0! | 6.49% | 4.02% |

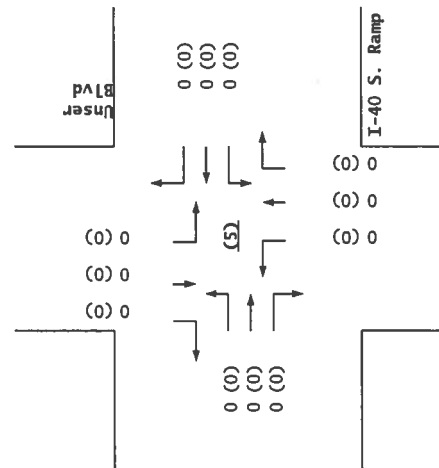
**Growth Rate to Apply to 2004 Model Volumes to Match 2030 Forecasts**

|                           |        |         |       |       |
|---------------------------|--------|---------|-------|-------|
| 2004-2030 AM Growth Rates | 16.85% | #DIV/0! | 5.83% | 1.84% |
| 2004-2030 PM Growth Rates | 1.21%  | #DIV/0! | 3.47% | 1.02% |

2012  
BUILD

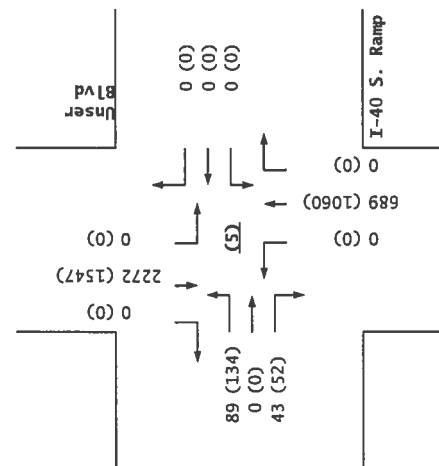


Trips



I-40 S. Ramp / Unser Blvd

2012  
NO BUILD



**Valero Commercial Development (Los Volcanes Rd / Unser Blvd)**  
**Projected Turning Movements Worksheet**  
**Saul Bell Rd. / Unser Blvd**

**INTERSECTION:** E-W Street: **Saul Bell Rd.** (6)  
 N-S Street: **Unser Blvd**  
 Year of Existing Counts: **2010**  
 Implementation Year: **2012**  
 Growth Rates

|                                              | 3.00%                     |       |       | 0.00%                     |       |       | 3.00%                   |        |       | 3.00%                   |        |       |
|----------------------------------------------|---------------------------|-------|-------|---------------------------|-------|-------|-------------------------|--------|-------|-------------------------|--------|-------|
|                                              | Eastbound (Saul Bell Rd.) |       |       | Westbound (Saul Bell Rd.) |       |       | Northbound (Unser Blvd) |        |       | Southbound (Unser Blvd) |        |       |
|                                              | Left                      | Thru  | Right | Left                      | Thru  | Right | Left                    | Thru   | Right | Left                    | Thru   | Right |
| Existing Volumes                             | 0                         | 0     | 6     | 0                         | 0     | 0     | 0                       | 0      | 0     | 0                       | 0      | 11    |
| Background Traffic Growth                    | 0                         | 0     | 0     | 0                         | 0     | 0     | 0                       | 0      | 0     | 0                       | 0      | 1     |
| Subtotal                                     | 0                         | 0     | 6     | 0                         | 0     | 0     | 0                       | 1,371  | 0     | 0                       | 1,663  | 12    |
| Unser Town Center Trips Generated            | 0                         | 0     | 0     | 0                         | 0     | 0     | 0                       | 42     | 0     | 0                       | 32     | 0     |
| Unser Crossing Trips Generated               | 0                         | 0     | 0     | 0                         | 0     | 0     | 0                       | 11     | 0     | 0                       | 13     | 0     |
| Subtotal (NO BUILD - A.M.)                   | 0                         | 0     | 6     | 0                         | 0     | 0     | 0                       | 1,424  | 0     | 0                       | 1,708  | 12    |
| Percent Commercial Trips Generated(Entering) | 0.00%                     | 0.00% | 0.00% | 0.00%                     | 0.00% | 0.00% | 41.61%                  | 20.49% | 0.00% | 0.00%                   | 0.00%  | 0.00% |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                     | 0.00% | 1.61% | 0.00%                     | 0.00% | 0.00% | 0.00%                   | 0.00%  | 0.00% | 0.00%                   | 60.49% | 0.00% |
| Total Trips Generated                        | 0                         | 0     | 2     | 0                         | 0     | 0     | 42                      | 21     | 0     | 0                       | 62     | 0     |
| Total AM Peak Hour BUILD Volumes             | 0                         | 0     | 8     | 0                         | 0     | 0     | 42                      | 1,445  | 0     | 0                       | 1,770  | 12    |

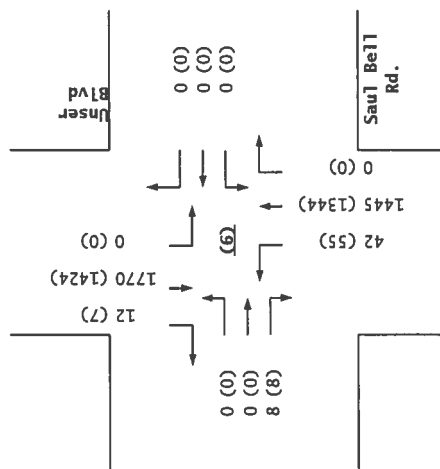
|                                              | 3.00%                     |       |       | 0.00%                     |       |       | 4.08%                   |        |       | 1.21%                   |        |       |
|----------------------------------------------|---------------------------|-------|-------|---------------------------|-------|-------|-------------------------|--------|-------|-------------------------|--------|-------|
|                                              | Eastbound (Saul Bell Rd.) |       |       | Westbound (Saul Bell Rd.) |       |       | Northbound (Unser Blvd) |        |       | Southbound (Unser Blvd) |        |       |
|                                              | Left                      | Thru  | Right | Left                      | Thru  | Right | Left                    | Thru   | Right | Left                    | Thru   | Right |
| Existing Volumes                             | 0                         | 0     | 6     | 0                         | 0     | 0     | 0                       | 0      | 0     | 0                       | 0      | 7     |
| Background Traffic Growth                    | 0                         | 0     | 0     | 0                         | 0     | 0     | 0                       | 0      | 0     | 0                       | 0      | 0     |
| Subtotal                                     | 0                         | 0     | 6     | 0                         | 0     | 0     | 0                       | 1,231  | 0     | 0                       | 1,259  | 7     |
| Unser Town Center Trips Generated            | 0                         | 0     | 0     | 0                         | 0     | 0     | 0                       | 77     | 0     | 0                       | 77     | 0     |
| Unser Crossing Trips Generated               | 0                         | 0     | 0     | 0                         | 0     | 0     | 0                       | 24     | 0     | 0                       | 23     | 0     |
| Subtotal (NO BUILD - P.M.)                   | 0                         | 0     | 6     | 0                         | 0     | 0     | 0                       | 1,332  | 0     | 0                       | 1,359  | 7     |
| Percent Commercial Trips Generated(Entering) | 0.00%                     | 0.00% | 0.00% | 0.00%                     | 0.00% | 0.00% | 41.61%                  | 20.49% | 0.00% | 0.00%                   | 0.00%  | 0.00% |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                     | 0.00% | 1.61% | 0.00%                     | 0.00% | 0.00% | 0.00%                   | 0.00%  | 0.00% | 0.00%                   | 60.49% | 0.00% |
| Total Trips Generated                        | 0                         | 0     | 2     | 0                         | 0     | 0     | 45                      | 22     | 0     | 0                       | 65     | 0     |
| Subtotal PM Pk Hr. BUILD Volumes             | 0                         | 0     | 8     | 0                         | 0     | 0     | 45                      | 1,354  | 0     | 0                       | 1,424  | 7     |
| Pass-by Trip Adjustments                     | 0                         | 0     | 0     | 0                         | 0     | 0     | 10                      | -10    | 0     | 0                       | 0      | 0     |
| Total PM Peak Hour BUILD Volumes             | 0                         | 0     | 8     | 0                         | 0     | 0     | 55                      | 1,344  | 0     | 0                       | 1,424  | 7     |

Number of Commercial Trips Generated

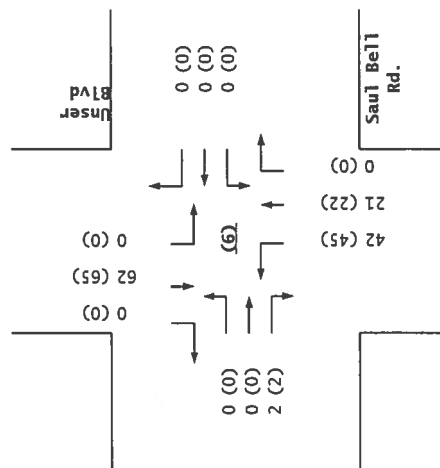
|          |     |     |      |                             |
|----------|-----|-----|------|-----------------------------|
| Entering | 102 | 102 | A.M. | 100% Commercial Development |
| Exiting  | 107 | 107 | P.M. |                             |

|                          | Eastbound (Saul Bell Rd.) |      |       | Westbound (Saul Bell Rd.) |      |       | Northbound (Unser Blvd) |      |       | Southbound (Unser Blvd) |      |       |
|--------------------------|---------------------------|------|-------|---------------------------|------|-------|-------------------------|------|-------|-------------------------|------|-------|
|                          | Left                      | Thru | Right | Left                      | Thru | Right | Left                    | Thru | Right | Left                    | Thru | Right |
| 2010 AM Peak Hr. Volumes | 0                         | 0    | 6     | 0                         | 0    | 0     | 0                       | 0    | 0     | 0                       | 0    | 11    |
| 2010 PM Peak Hr. Volumes | 0                         | 0    | 6     | 0                         | 0    | 0     | 0                       | 0    | 0     | 0                       | 0    | 7     |

2012  
BUILD

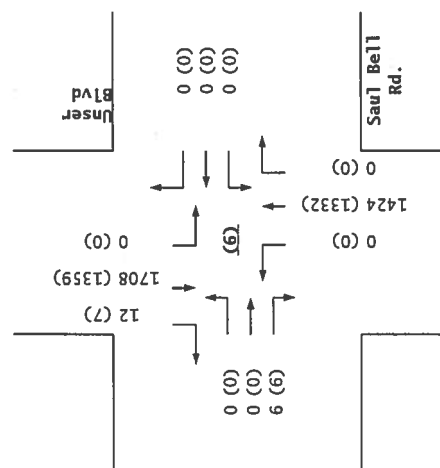


Trips



Saul Bell Rd. / Unser Blvd  
Case "y"

2012  
NO BUILD



**Valero Commercial Development (Los Volcanes Rd / Unser Blvd)**  
**Projected Turning Movements Worksheet**  
**Los Volcanes Rd / Driveway 'A'**

**INTERSECTION :** E-W Street: **Los Volcanes Rd** (7)  
 N-S Street: **Driveway 'A'**  
 Year of Existing Counts: **2010**  
 Implementation Year: **2012**  
 Growth Rates

|                                              | 3.00%                       |        |       | 3.00%                       |       |       | 3.00%                     |       |       | 3.00%                     |       |       |
|----------------------------------------------|-----------------------------|--------|-------|-----------------------------|-------|-------|---------------------------|-------|-------|---------------------------|-------|-------|
|                                              | Eastbound (Los Volcanes Rd) |        |       | Westbound (Los Volcanes Rd) |       |       | Northbound (Driveway 'A') |       |       | Southbound (Driveway 'A') |       |       |
|                                              | Left                        | Thru   | Right | Left                        | Thru  | Right | Left                      | Thru  | Right | Left                      | Thru  | Right |
| Existing Volumes                             | 0                           | 302    | 0     | 0                           | 260   | 0     | 0                         | 0     | 0     | 0                         | 0     | 0     |
| Background Traffic Growth                    | 0                           | 18     | 0     | 0                           | 16    | 0     | 0                         | 0     | 0     | 0                         | 0     | 0     |
| Subtotal                                     | 0                           | 320    | 0     | 0                           | 276   | 0     | 0                         | 0     | 0     | 0                         | 0     | 0     |
| Unser Town Center Trips Generated            | 0                           | 5      | 0     | 0                           | 4     | 0     | 0                         | 0     | 0     | 0                         | 0     | 0     |
| Subtotal (NO BUILD - A.M.)                   | 0                           | 325    | 0     | 0                           | 280   | 0     | 0                         | 0     | 0     | 0                         | 0     | 0     |
| Percent Commercial Trips Generated(Entering) | 0.00%                       | 14.07% | 4.69% | 36.52%                      | 0.00% | 0.00% | 0.00%                     | 0.00% | 0.00% | 0.00%                     | 0.00% | 0.00% |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                       | 0.00%  | 0.00% | 0.00%                       | 0.00% | 0.00% | 18.76%                    | 0.00% | 0.00% | 0.00%                     | 0.00% | 0.00% |
| Total Trips Generated                        | 0                           | 14     | 5     | 37                          | 0     | 0     | 19                        | 0     | 0     | 0                         | 0     | 0     |
| Total AM Peak Hour BUILD Volumes             | 0                           | 339    | 5     | 37                          | 280   | 0     | 19                        | 0     | 0     | 0                         | 0     | 0     |

|                                              | 9.02%                       |        |       | 8.01%                       |       |       | 3.00%                     |       |       | 3.00%                     |       |       |
|----------------------------------------------|-----------------------------|--------|-------|-----------------------------|-------|-------|---------------------------|-------|-------|---------------------------|-------|-------|
|                                              | Eastbound (Los Volcanes Rd) |        |       | Westbound (Los Volcanes Rd) |       |       | Northbound (Driveway 'A') |       |       | Southbound (Driveway 'A') |       |       |
|                                              | Left                        | Thru   | Right | Left                        | Thru  | Right | Left                      | Thru  | Right | Left                      | Thru  | Right |
| Existing Volumes                             | 0                           | 128    | 0     | 0                           | 138   | 0     | 0                         | 0     | 0     | 0                         | 0     | 0     |
| Background Traffic Growth                    | 0                           | 23     | 0     | 0                           | 22    | 0     | 0                         | 0     | 0     | 0                         | 0     | 0     |
| Subtotal                                     | 0                           | 151    | 0     | 0                           | 160   | 0     | 0                         | 0     | 0     | 0                         | 0     | 0     |
| Unser Town Center Trips Generated            | 0                           | 10     | 0     | 0                           | 10    | 0     | 0                         | 0     | 0     | 0                         | 0     | 0     |
| Subtotal (NO BUILD - P.M.)                   | 0                           | 161    | 0     | 0                           | 170   | 0     | 0                         | 0     | 0     | 0                         | 0     | 0     |
| Percent Commercial Trips Generated(Entering) | 0.00%                       | 14.07% | 4.69% | 36.52%                      | 0.00% | 0.00% | 0.00%                     | 0.00% | 0.00% | 0.00%                     | 0.00% | 0.00% |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                       | 0.00%  | 0.00% | 0.00%                       | 0.00% | 0.00% | 18.76%                    | 0.00% | 0.00% | 0.00%                     | 0.00% | 0.00% |
| Total Trips Generated                        | 0                           | 15     | 5     | 39                          | 0     | 0     | 20                        | 0     | 0     | 0                         | 0     | 0     |
| Subtotal PM Pk Hr. BUILD Volumes             | 0                           | 176    | 5     | 39                          | 170   | 0     | 20                        | 0     | 0     | 0                         | 0     | 0     |
| Pass-by Trip Adjustments                     | 0                           | 0      | 0     | 7                           | 0     | 0     | 0                         | 0     | 0     | 0                         | 0     | 0     |
| Total PM Peak Hour BUILD Volumes             | 0                           | 176    | 5     | 46                          | 170   | 0     | 20                        | 0     | 0     | 0                         | 0     | 0     |

Number of Commercial Trips Generated

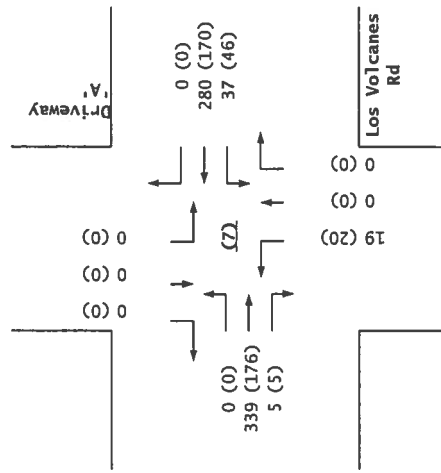
|          |         |      |                             |
|----------|---------|------|-----------------------------|
| Entering | Exiting | A.M. | 100% Commercial Development |
| 102      | 102     |      |                             |
| 107      | 107     | P.M. |                             |

|                          | Eastbound (Los Volcanes Rd) |     |   | Westbound (Los Volcanes Rd) |     |   | Northbound (Driveway 'A') |   |   | Southbound (Driveway 'A') |   |   |
|--------------------------|-----------------------------|-----|---|-----------------------------|-----|---|---------------------------|---|---|---------------------------|---|---|
| 2010 AM Peak Hr. Volumes | 0                           | 302 | 0 | 0                           | 260 | 0 | 0                         | 0 | 0 | 0                         | 0 | 0 |
| 2010 PM Peak Hr. Volumes | 0                           | 128 | 0 | 0                           | 138 | 0 | 0                         | 0 | 0 | 0                         | 0 | 0 |

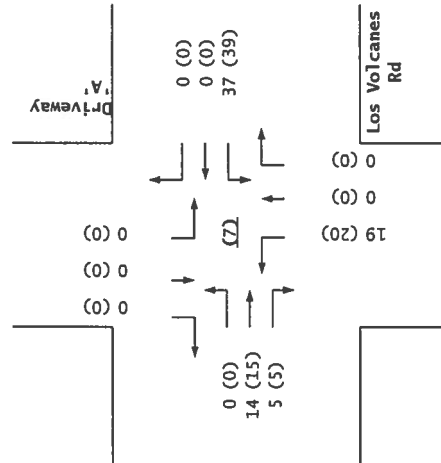
**Pass-by Trip Calculations:**

|                     | Eastbound (Los Volcanes Rd) |         |       | Westbound (Los Volcanes Rd) |       |       | Northbound (Driveway 'A') |       |       | Southbound (Driveway 'A') |       |       |
|---------------------|-----------------------------|---------|-------|-----------------------------|-------|-------|---------------------------|-------|-------|---------------------------|-------|-------|
| PM Pass-by Trips    | 0.00%                       | 0.00%   | 0.00% | 26.00%                      | 0.00% | 0.00% | 0.00%                     | 0.00% | 0.00% | 0.00%                     | 0.00% | 0.00% |
| Percent Entering    | 0                           | 0       | 0     | 7                           | 0     | 0     | 0                         | 0     | 0     | 0                         | 0     | 0     |
| Volume Entering     | 0.00%                       | 0.00%   | 0.00% | 0.00%                       | 0.00% | 0.00% | 0.00%                     | 0.00% | 0.00% | 0.00%                     | 0.00% | 0.00% |
| Percent Exiting     | 0                           | 0       | 0     | 0                           | 0     | 0     | 0                         | 0     | 0     | 0                         | 0     | 0     |
| Volume Exiting      | 0                           | 0       | 0     | 0                           | 0     | 0     | 0                         | 0     | 0     | 0                         | 0     | 0     |
| Net PM Passby Trips | 0                           | 0       | 0     | 7                           | 0     | 0     | 0                         | 0     | 0     | 0                         | 0     | 0     |
| Pass-by Trips       | Entering                    | Exiting |       |                             |       |       |                           |       |       |                           |       |       |
|                     | 0                           | 0       | AM    |                             |       |       |                           |       |       |                           |       |       |
|                     | 27                          | 27      | PM    |                             |       |       |                           |       |       |                           |       |       |

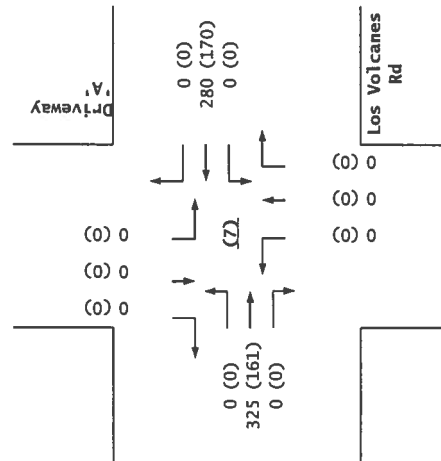
2012  
BUILD



Trips



2012  
NO BUILD



Los Volcanes Rd / Driveway 'A'  
Case "y"

**Valero Commercial Development (Los Volcanes Rd / Unser Blvd)**  
**Projected Turning Movements Worksheet**  
**Los Volcanes Rd / Driveway 'B'**

**INTERSECTION:** E-W Street: Los Volcanes Rd (8)  
 N-S Street: Driveway 'B'  
 Year of Existing Counts: 2010  
 Implementation Year: 2012  
 Growth Rates:

|                                              | 3.00%                       |       |        | 3.00%                       |        |       | 3.00%                     |       |        | 3.00%                     |       |       |
|----------------------------------------------|-----------------------------|-------|--------|-----------------------------|--------|-------|---------------------------|-------|--------|---------------------------|-------|-------|
|                                              | Eastbound (Los Volcanes Rd) |       |        | Westbound (Los Volcanes Rd) |        |       | Northbound (Driveway 'B') |       |        | Southbound (Driveway 'B') |       |       |
|                                              | Left                        | Thru  | Right  | Left                        | Thru   | Right | Left                      | Thru  | Right  | Left                      | Thru  | Right |
| Existing Volumes                             | 0                           | 302   | 0      | 0                           | 260    | 0     | 0                         | 0     | 0      | 0                         | 0     | 0     |
| Background Traffic Growth                    | 0                           | 18    | 0      | 0                           | 16     | 0     | 0                         | 0     | 0      | 0                         | 0     | 0     |
| Subtotal                                     | 0                           | 320   | 0      | 0                           | 276    | 0     | 0                         | 0     | 0      | 0                         | 0     | 0     |
| Unser Town Center Trips Generated            | 0                           | 5     | 0      | 0                           | 4      | 0     | 0                         | 0     | 0      | 0                         | 0     | 0     |
| Subtotal (NO BUILD - A.M.)                   | 0                           | 325   | 0      | 0                           | 280    | 0     | 0                         | 0     | 0      | 0                         | 0     | 0     |
| Percent Commercial Trips Generated(Entering) | 0.00%                       | 0.00% | 14.07% | 0.00%                       | 36.52% | 0.00% | 0.00%                     | 0.00% | 0.00%  | 0.00%                     | 0.00% | 0.00% |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                       | 0.00% | 0.00%  | 0.00%                       | 0.00%  | 0.00% | 0.00%                     | 0.00% | 36.52% | 0.00%                     | 0.00% | 0.00% |
| Total Trips Generated                        | 0                           | 0     | 14     | 0                           | 37     | 0     | 0                         | 0     | 37     | 0                         | 0     | 0     |
| Total AM Peak Hour BUILD Volumes             | 0                           | 325   | 14     | 0                           | 317    | 0     | 0                         | 0     | 37     | 0                         | 0     | 0     |

|                                              | 9.02%                       |       |        | 8.01%                       |        |       | 3.00%                     |       |        | 3.00%                     |       |       |
|----------------------------------------------|-----------------------------|-------|--------|-----------------------------|--------|-------|---------------------------|-------|--------|---------------------------|-------|-------|
|                                              | Eastbound (Los Volcanes Rd) |       |        | Westbound (Los Volcanes Rd) |        |       | Northbound (Driveway 'B') |       |        | Southbound (Driveway 'B') |       |       |
|                                              | Left                        | Thru  | Right  | Left                        | Thru   | Right | Left                      | Thru  | Right  | Left                      | Thru  | Right |
| Existing Volumes                             | 0                           | 128   | 0      | 0                           | 138    | 0     | 0                         | 0     | 0      | 0                         | 0     | 0     |
| Background Traffic Growth                    | 0                           | 23    | 0      | 0                           | 22     | 0     | 0                         | 0     | 0      | 0                         | 0     | 0     |
| Subtotal                                     | 0                           | 151   | 0      | 0                           | 160    | 0     | 0                         | 0     | 0      | 0                         | 0     | 0     |
| Unser Town Center Trips Generated            | 0                           | 10    | 0      | 0                           | 10     | 0     | 0                         | 0     | 0      | 0                         | 0     | 0     |
| Subtotal (NO BUILD - P.M.)                   | 0                           | 161   | 0      | 0                           | 170    | 0     | 0                         | 0     | 0      | 0                         | 0     | 0     |
| Percent Commercial Trips Generated(Entering) | 0.00%                       | 0.00% | 14.07% | 0.00%                       | 36.52% | 0.00% | 0.00%                     | 0.00% | 0.00%  | 0.00%                     | 0.00% | 0.00% |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                       | 0.00% | 0.00%  | 0.00%                       | 0.00%  | 0.00% | 0.00%                     | 0.00% | 36.52% | 0.00%                     | 0.00% | 0.00% |
| Total Trips Generated                        | 0                           | 0     | 15     | 0                           | 39     | 0     | 0                         | 0     | 39     | 0                         | 0     | 0     |
| Subtotal PM Pk Hr. BUILD Volumes             | 0                           | 161   | 15     | 0                           | 209    | 0     | 0                         | 0     | 39     | 0                         | 0     | 0     |
| Pass-by Trip Adjustments                     | 0                           | 0     | 0      | 0                           | 7      | 0     | 0                         | 0     | 18     | 0                         | 0     | 0     |
| Total PM Peak Hour BUILD Volumes             | 0                           | 161   | 15     | 0                           | 216    | 0     | 0                         | 0     | 57     | 0                         | 0     | 0     |

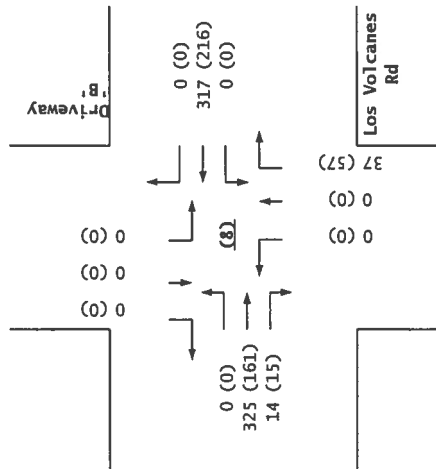
Number of Commercial Trips Generated: Entering 102, Exiting 107, A.M. 100%, P.M. 100% Commercial Development

|                          | Eastbound (Los Volcanes Rd) |     |   | Westbound (Los Volcanes Rd) |     |   | Northbound (Driveway 'B') |   |   | Southbound (Driveway 'B') |   |   |
|--------------------------|-----------------------------|-----|---|-----------------------------|-----|---|---------------------------|---|---|---------------------------|---|---|
| 2010 AM Peak Hr. Volumes | 0                           | 302 | 0 | 0                           | 260 | 0 | 0                         | 0 | 0 | 0                         | 0 | 0 |
| 2010 PM Peak Hr. Volumes | 0                           | 128 | 0 | 0                           | 138 | 0 | 0                         | 0 | 0 | 0                         | 0 | 0 |

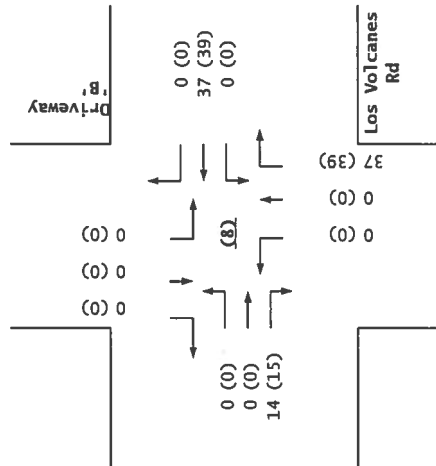
**Pass-by Trip Calculations:**

|                     | Eastbound (Los Volcanes Rd) |       |       | Westbound (Los Volcanes Rd) |        |       | Northbound (Driveway 'B') |       |        | Southbound (Driveway 'B') |       |       |
|---------------------|-----------------------------|-------|-------|-----------------------------|--------|-------|---------------------------|-------|--------|---------------------------|-------|-------|
| PM Pass-by Trips    | 0.00%                       | 0.00% | 0.00% | 0.00%                       | 26.00% | 0.00% | 0.00%                     | 0.00% | 0.00%  | 0.00%                     | 0.00% | 0.00% |
| Percent Entering    | 0                           | 0     | 0     | 0                           | 7      | 0     | 0                         | 0     | 0      | 0                         | 0     | 0     |
| Volume Entering     | 0.00%                       | 0.00% | 0.00% | 0.00%                       | 0.00%  | 0.00% | 0.00%                     | 0.00% | 68.00% | 0.00%                     | 0.00% | 0.00% |
| Percent Exiting     | 0                           | 0     | 0     | 0                           | 0      | 0     | 0                         | 0     | 18     | 0                         | 0     | 0     |
| Volume Exiting      | 0                           | 0     | 0     | 0                           | 7      | 0     | 0                         | 0     | 18     | 0                         | 0     | 0     |
| Net PM Passby Trips | 0                           | 0     | 0     | 0                           | 7      | 0     | 0                         | 0     | 18     | 0                         | 0     | 0     |
| Pass-by Trips       | 0                           | 0     | 0     | 0                           | 0      | 0     | 0                         | 0     | 0      | 0                         | 0     | 0     |
| Entering            | 0                           | 0     | 0     | 0                           | 0      | 0     | 0                         | 0     | 0      | 0                         | 0     | 0     |
| Exiting             | 0                           | 0     | 0     | 0                           | 0      | 0     | 0                         | 0     | 0      | 0                         | 0     | 0     |
| 27                  | 27                          | 27    | 27    | 27                          | 27     | 27    | 27                        | 27    | 27     | 27                        | 27    | 27    |

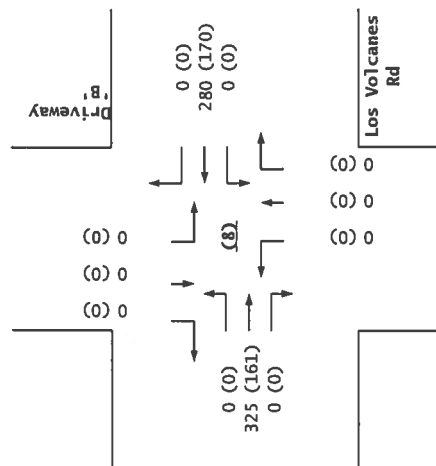
2012  
BUILD



Trips



2012  
NO BUILD



Los Volcanes Rd / Driveway 'B'  
Case "y"

**Valero Commercial Development (Los Volcanes Rd / Unser Blvd)**

## Projected Turning Movements Worksheet

**Driveway "C" / Unser Blvd****INTERSECTION :**

E-W Street: Driveway "C" (9)

N-S Street: Unser Blvd

Year of Existing Counts 2010

Implementation Year 2012

Growth Rates

|                                              | 3.00%                    |       |        | 3.00%                    |       |       | 3.00%                   |        |       | 3.00%                   |        |       |
|----------------------------------------------|--------------------------|-------|--------|--------------------------|-------|-------|-------------------------|--------|-------|-------------------------|--------|-------|
|                                              | Eastbound (Driveway "C") |       |        | Westbound (Driveway "C") |       |       | Northbound (Unser Blvd) |        |       | Southbound (Unser Blvd) |        |       |
|                                              | Left                     | Thru  | Right  | Left                     | Thru  | Right | Left                    | Thru   | Right | Left                    | Thru   | Right |
| Existing Volumes                             | 0                        | 0     | 0      | 0                        | 0     | 0     | 0                       | 0      | 0     | 0                       | 0      | 0     |
| Background Traffic Growth                    | 0                        | 0     | 0      | 0                        | 0     | 0     | 0                       | 0      | 0     | 0                       | 0      | 0     |
| Subtotal                                     | 0                        | 0     | 0      | 0                        | 0     | 0     | 0                       | 1,371  | 0     | 0                       | 1,663  | 0     |
| Unser Town Center Trips Generated            | 0                        | 0     | 0      | 0                        | 0     | 0     | 0                       | 42     | 0     | 0                       | 32     | 0     |
| Unser Crossing Trips Generated               | 0                        | 0     | 0      | 0                        | 0     | 0     | 0                       | 11     | 0     | 0                       | 13     | 0     |
| Subtotal (NO BUILD - A.M.)                   | 0                        | 0     | 0      | 0                        | 0     | 0     | 0                       | 1,424  | 0     | 0                       | 1,708  | 0     |
| Percent Commercial Trips Generated(Entering) | 0.00%                    | 0.00% | 0.00%  | 0.00%                    | 0.00% | 0.00% | 0.00%                   | 20.49% | 0.00% | 0.00%                   | 0.00%  | 0.00% |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                    | 0.00% | 40.00% | 0.00%                    | 0.00% | 0.00% | 0.00%                   | 0.00%  | 0.00% | 0.00%                   | 20.49% | 0.00% |
| Total Trips Generated                        | 0                        | 0     | 41     | 0                        | 0     | 0     | 0                       | 21     | 0     | 0                       | 21     | 0     |
| Total AM Peak Hour BUILD Volumes             | 0                        | 0     | 41     | 0                        | 0     | 0     | 0                       | 1,445  | 0     | 0                       | 1,729  | 0     |

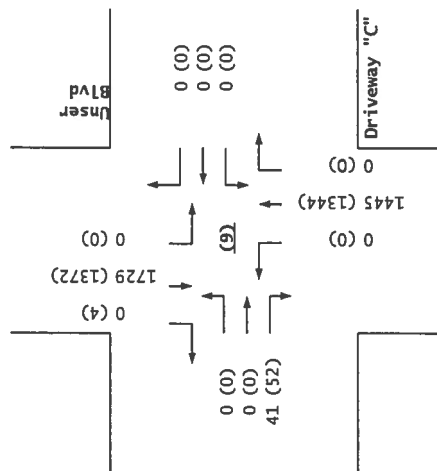
|                                              | 3.00%                    |       |        | 3.00%                    |       |       | 4.08%                   |        |       | 1.21%                   |        |       |
|----------------------------------------------|--------------------------|-------|--------|--------------------------|-------|-------|-------------------------|--------|-------|-------------------------|--------|-------|
|                                              | Eastbound (Driveway "C") |       |        | Westbound (Driveway "C") |       |       | Northbound (Unser Blvd) |        |       | Southbound (Unser Blvd) |        |       |
|                                              | Left                     | Thru  | Right  | Left                     | Thru  | Right | Left                    | Thru   | Right | Left                    | Thru   | Right |
| Existing Volumes                             | 0                        | 0     | 0      | 0                        | 0     | 0     | 0                       | 0      | 0     | 0                       | 0      | 0     |
| Background Traffic Growth                    | 0                        | 0     | 0      | 0                        | 0     | 0     | 0                       | 0      | 0     | 0                       | 0      | 0     |
| Subtotal                                     | 0                        | 0     | 0      | 0                        | 0     | 0     | 0                       | 1,231  | 0     | 0                       | 1,259  | 0     |
| Unser Town Center Trips Generated            | 0                        | 0     | 0      | 0                        | 0     | 0     | 0                       | 77     | 0     | 0                       | 77     | 0     |
| Unser Crossing Trips Generated               | 0                        | 0     | 0      | 0                        | 0     | 0     | 0                       | 24     | 0     | 0                       | 23     | 0     |
| Subtotal (NO BUILD - P.M.)                   | 0                        | 0     | 0      | 0                        | 0     | 0     | 0                       | 1,332  | 0     | 0                       | 1,359  | 0     |
| Percent Commercial Trips Generated(Entering) | 0.00%                    | 0.00% | 0.00%  | 0.00%                    | 0.00% | 0.00% | 0.00%                   | 20.49% | 0.00% | 0.00%                   | 0.00%  | 0.00% |
| Percent Commercial Trips Generated(Exiting)  | 0.00%                    | 0.00% | 40.00% | 0.00%                    | 0.00% | 0.00% | 0.00%                   | 0.00%  | 0.00% | 0.00%                   | 20.49% | 0.00% |
| Total Trips Generated                        | 0                        | 0     | 43     | 0                        | 0     | 0     | 0                       | 22     | 0     | 0                       | 22     | 0     |
| Subtotal PM Pk Hr. BUILD Volumes             | 0                        | 0     | 43     | 0                        | 0     | 0     | 0                       | 1,354  | 0     | 0                       | 1,381  | 0     |
| Pass-by Trip Adjustments                     | 0                        | 0     | 9      | 0                        | 0     | 0     | 0                       | -10    | 0     | 0                       | -9     | 4     |
| Total PM Peak Hour BUILD Volumes             | 0                        | 0     | 52     | 0                        | 0     | 0     | 0                       | 1,344  | 0     | 0                       | 1,372  | 4     |

Number of Commercial Trips Generated

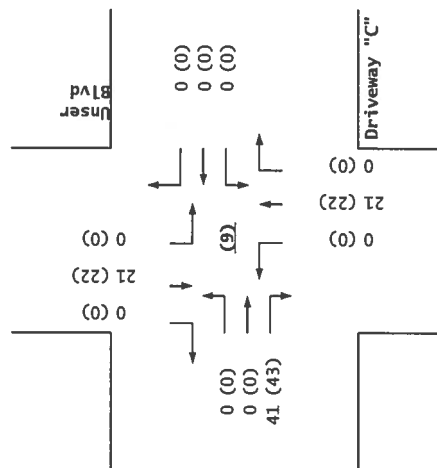
|          |     |     |      |                             |
|----------|-----|-----|------|-----------------------------|
| Entering | 102 | 102 | A.M. | 100% Commercial Development |
| Exiting  | 107 | 107 | P.M. |                             |

|                          | Eastbound (Driveway "C") |      |       | Westbound (Driveway "C") |      |       | Northbound (Unser Blvd) |      |       | Southbound (Unser Blvd) |      |       |
|--------------------------|--------------------------|------|-------|--------------------------|------|-------|-------------------------|------|-------|-------------------------|------|-------|
|                          | Left                     | Thru | Right | Left                     | Thru | Right | Left                    | Thru | Right | Left                    | Thru | Right |
| 2010 AM Peak Hr. Volumes | 0                        | 0    | 0     | 0                        | 0    | 0     | 0                       | 0    | 0     | 0                       | 0    | 0     |
| 2010 PM Peak Hr. Volumes | 0                        | 0    | 0     | 0                        | 0    | 0     | 0                       | 0    | 0     | 0                       | 0    | 0     |

2012  
BUILD

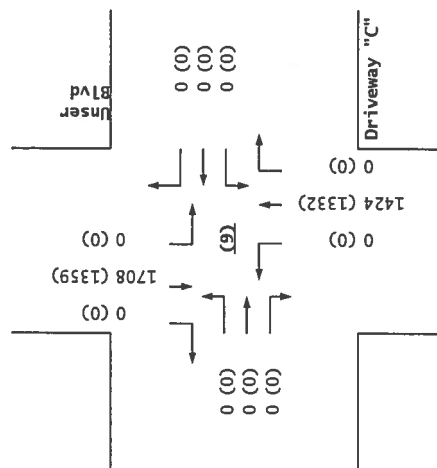


Trips



Driveway "C" / Unser Blvd  
Case "y"

2012  
NO BUILD



# Timings

## 1: Los Volcanes Rd & Unser Blvd

Terry O. Brown, P.E.

12/29/2010 - Synchro 7

|                      |  |  |  |  |  |  |   |  |  |  |  |
|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group           | EBL                                                                               | EBT                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations  |  |  |  |  |  |  |  |  |  |  |  |
| Volume (vph)         | 182                                                                               | 127                                                                               | 94                                                                                | 32                                                                                | 152                                                                               | 24                                                                                | 1253                                                                                | 147                                                                                 | 462                                                                                 | 1614                                                                                | 220                                                                                 |
| Turn Type            | Prot                                                                              |                                                                                   | pm+pt                                                                             |                                                                                   | pm+ov                                                                             | pm+pt                                                                             |                                                                                     | pm+ov                                                                               | pm+pt                                                                               |                                                                                     | pm+ov                                                                               |
| Protected Phases     | 7                                                                                 | 4                                                                                 | 3                                                                                 | 8                                                                                 | 1                                                                                 | 5                                                                                 | 2                                                                                   | 3                                                                                   | 1                                                                                   | 6                                                                                   | 7                                                                                   |
| Permitted Phases     |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 8                                                                                 | 2                                                                                 |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     | 6                                                                                   |
| Detector Phase       | 7                                                                                 | 4                                                                                 | 3                                                                                 | 8                                                                                 | 1                                                                                 | 5                                                                                 | 2                                                                                   | 3                                                                                   | 1                                                                                   | 6                                                                                   | 7                                                                                   |
| Switch Phase         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Minimum Initial (s)  | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 |
| Minimum Split (s)    | 10.0                                                                              | 21.0                                                                              | 10.0                                                                              | 21.0                                                                              | 10.0                                                                              | 10.0                                                                              | 21.0                                                                                | 10.0                                                                                | 10.0                                                                                | 21.0                                                                                | 10.0                                                                                |
| Total Split (s)      | 11.0                                                                              | 21.0                                                                              | 11.0                                                                              | 21.0                                                                              | 36.0                                                                              | 10.0                                                                              | 52.0                                                                                | 11.0                                                                                | 36.0                                                                                | 78.0                                                                                | 11.0                                                                                |
| Total Split (%)      | 9.2%                                                                              | 17.5%                                                                             | 9.2%                                                                              | 17.5%                                                                             | 30.0%                                                                             | 8.3%                                                                              | 43.3%                                                                               | 9.2%                                                                                | 30.0%                                                                               | 65.0%                                                                               | 9.2%                                                                                |
| Yellow Time (s)      | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 |
| All-Red Time (s)     | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 |
| Lost Time Adjust (s) | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                |
| Total Lost Time (s)  | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lead/Lag             | Lead                                                                              | Lag                                                                               | Lead                                                                              | Lag                                                                               | Lead                                                                              | Lead                                                                              | Lag                                                                                 | Lead                                                                                | Lead                                                                                | Lag                                                                                 | Lead                                                                                |
| Lead-Lag Optimize?   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Recall Mode          | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | C-Max                                                                               | Min                                                                                 | Min                                                                                 | C-Max                                                                               | Min                                                                                 |
| Act Effct Green (s)  | 8.0                                                                               | 15.8                                                                              | 23.8                                                                              | 15.8                                                                              | 54.0                                                                              | 56.4                                                                              | 49.0                                                                                | 60.0                                                                                | 87.2                                                                                | 76.8                                                                                | 87.8                                                                                |
| Actuated g/C Ratio   | 0.07                                                                              | 0.13                                                                              | 0.20                                                                              | 0.13                                                                              | 0.45                                                                              | 0.47                                                                              | 0.41                                                                                | 0.50                                                                                | 0.73                                                                                | 0.64                                                                                | 0.73                                                                                |
| v/c Ratio            | 0.86                                                                              | 0.62                                                                              | 0.59                                                                              | 0.18                                                                              | 0.29                                                                              | 0.16                                                                              | 0.97                                                                                | 0.20                                                                                | 0.95                                                                                | 0.85                                                                                | 0.22                                                                                |
| Control Delay        | 88.5                                                                              | 59.3                                                                              | 51.1                                                                              | 47.0                                                                              | 21.0                                                                              | 16.9                                                                              | 41.8                                                                                | 7.2                                                                                 | 50.7                                                                                | 17.3                                                                                | 2.3                                                                                 |
| Queue Delay          | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Total Delay          | 88.5                                                                              | 59.3                                                                              | 51.1                                                                              | 47.0                                                                              | 21.0                                                                              | 16.9                                                                              | 41.8                                                                                | 7.2                                                                                 | 50.7                                                                                | 17.3                                                                                | 2.3                                                                                 |
| LOS                  | F                                                                                 | E                                                                                 | D                                                                                 | D                                                                                 | C                                                                                 | B                                                                                 | D                                                                                   | A                                                                                   | D                                                                                   | B                                                                                   | A                                                                                   |
| Approach Delay       |                                                                                   | 75.8                                                                              |                                                                                   | 34.1                                                                              |                                                                                   |                                                                                   | 37.8                                                                                |                                                                                     |                                                                                     | 22.6                                                                                |                                                                                     |
| Approach LOS         |                                                                                   | E                                                                                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | D                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 74 (62%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 32.0

Intersection LOS: C

Intersection Capacity Utilization 86.2%

ICU Level of Service E

Analysis Period (min) 15

### Splits and Phases: 1: Los Volcanes Rd & Unser Blvd

|                                                                                     |                                                                                     |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |
| ø1                                                                                  | ø2                                                                                  | ø3                                                                                    | ø4                                                                                    |
| 36 s                                                                                | 52 s                                                                                | 11 s                                                                                  | 21 s                                                                                  |
|  |  |  |  |
| ø5                                                                                  | ø6                                                                                  | ø7                                                                                    | ø8                                                                                    |
| 10 s                                                                                | 78 s                                                                                | 11 s                                                                                  | 21 s                                                                                  |

# HCM Signalized Intersection Capacity Analysis

## 1: Los Volcanes Rd & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                        |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement               | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations    |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Volume (vph)           | 182                                                                               | 127                                                                               | 12                                                                                | 94                                                                                | 32                                                                                | 152                                                                               | 24                                                                                | 1253                                                                                | 147                                                                                 | 462                                                                                 | 1614                                                                                | 220                                                                                 |
| Ideal Flow (vphpl)     | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)    | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lane Util. Factor      | 0.97                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |
| Frt                    | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.85                                                                              | 1.00                                                                              | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 1.00                                                                                | 0.85                                                                                |
| Flt Protected          | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              | 1.00                                                                              | 0.95                                                                              | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (prot)      | 3400                                                                              | 1821                                                                              |                                                                                   | 1752                                                                              | 1845                                                                              | 1568                                                                              | 1752                                                                              | 3505                                                                                | 1568                                                                                | 1752                                                                                | 3505                                                                                | 1568                                                                                |
| Flt Permitted          | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.39                                                                              | 1.00                                                                              | 1.00                                                                              | 0.08                                                                              | 1.00                                                                                | 1.00                                                                                | 0.08                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (perm)      | 3400                                                                              | 1821                                                                              |                                                                                   | 720                                                                               | 1845                                                                              | 1568                                                                              | 151                                                                               | 3505                                                                                | 1568                                                                                | 142                                                                                 | 3505                                                                                | 1568                                                                                |
| Peak-hour factor, PHF  | 0.93                                                                              | 0.93                                                                              | 0.93                                                                              | 0.75                                                                              | 0.75                                                                              | 0.75                                                                              | 0.90                                                                              | 0.90                                                                                | 0.90                                                                                | 0.85                                                                                | 0.85                                                                                | 0.85                                                                                |
| Adj. Flow (vph)        | 196                                                                               | 137                                                                               | 13                                                                                | 125                                                                               | 43                                                                                | 203                                                                               | 27                                                                                | 1392                                                                                | 163                                                                                 | 544                                                                                 | 1899                                                                                | 259                                                                                 |
| RTOR Reduction (vph)   | 0                                                                                 | 3                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 6                                                                                 | 0                                                                                 | 0                                                                                   | 49                                                                                  | 0                                                                                   | 0                                                                                   | 56                                                                                  |
| Lane Group Flow (vph)  | 196                                                                               | 147                                                                               | 0                                                                                 | 125                                                                               | 43                                                                                | 197                                                                               | 27                                                                                | 1392                                                                                | 114                                                                                 | 544                                                                                 | 1899                                                                                | 203                                                                                 |
| Turn Type              | Prot                                                                              |                                                                                   |                                                                                   | pm+pt                                                                             |                                                                                   | pm+ov                                                                             | pm+pt                                                                             |                                                                                     | pm+ov                                                                               | pm+pt                                                                               |                                                                                     | pm+ov                                                                               |
| Protected Phases       | 7                                                                                 | 4                                                                                 |                                                                                   | 3                                                                                 | 8                                                                                 | 1                                                                                 | 5                                                                                 | 2                                                                                   | 3                                                                                   | 1                                                                                   | 6                                                                                   | 7                                                                                   |
| Permitted Phases       |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 8                                                                                 | 2                                                                                 |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     | 6                                                                                   |
| Actuated Green, G (s)  | 6.0                                                                               | 13.8                                                                              |                                                                                   | 19.8                                                                              | 13.8                                                                              | 47.0                                                                              | 52.4                                                                              | 47.0                                                                                | 53.0                                                                                | 85.2                                                                                | 74.8                                                                                | 80.8                                                                                |
| Effective Green, g (s) | 8.0                                                                               | 15.8                                                                              |                                                                                   | 23.8                                                                              | 15.8                                                                              | 51.0                                                                              | 56.4                                                                              | 49.0                                                                                | 57.0                                                                                | 87.2                                                                                | 76.8                                                                                | 84.8                                                                                |
| Actuated g/C Ratio     | 0.07                                                                              | 0.13                                                                              |                                                                                   | 0.20                                                                              | 0.13                                                                              | 0.42                                                                              | 0.47                                                                              | 0.41                                                                                | 0.48                                                                                | 0.73                                                                                | 0.64                                                                                | 0.71                                                                                |
| Clearance Time (s)     | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 |
| Vehicle Extension (s)  | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lane Grp Cap (vph)     | 227                                                                               | 240                                                                               |                                                                                   | 212                                                                               | 243                                                                               | 706                                                                               | 170                                                                               | 1431                                                                                | 784                                                                                 | 575                                                                                 | 2243                                                                                | 1147                                                                                |
| v/s Ratio Prot         | c0.06                                                                             | c0.08                                                                             |                                                                                   | 0.04                                                                              | 0.02                                                                              | 0.08                                                                              | 0.01                                                                              | 0.40                                                                                | 0.01                                                                                | c0.28                                                                               | 0.54                                                                                | 0.01                                                                                |
| v/s Ratio Perm         |                                                                                   |                                                                                   |                                                                                   | 0.08                                                                              |                                                                                   | 0.04                                                                              | 0.07                                                                              |                                                                                     | 0.06                                                                                | c0.41                                                                               |                                                                                     | 0.12                                                                                |
| v/c Ratio              | 0.86                                                                              | 0.61                                                                              |                                                                                   | 0.59                                                                              | 0.18                                                                              | 0.28                                                                              | 0.16                                                                              | 0.97                                                                                | 0.15                                                                                | 0.95                                                                                | 0.85                                                                                | 0.18                                                                                |
| Uniform Delay, d1      | 55.5                                                                              | 49.2                                                                              |                                                                                   | 41.7                                                                              | 46.3                                                                              | 22.5                                                                              | 19.6                                                                              | 34.8                                                                                | 17.8                                                                                | 35.5                                                                                | 17.0                                                                                | 5.9                                                                                 |
| Progression Factor     | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.51                                                                              | 0.77                                                                                | 0.92                                                                                | 0.86                                                                                | 0.80                                                                                | 1.29                                                                                |
| Incremental Delay, d2  | 27.0                                                                              | 4.6                                                                               |                                                                                   | 4.2                                                                               | 0.4                                                                               | 0.2                                                                               | 0.3                                                                               | 14.1                                                                                | 0.1                                                                                 | 19.5                                                                                | 3.0                                                                                 | 0.1                                                                                 |
| Delay (s)              | 82.5                                                                              | 53.8                                                                              |                                                                                   | 45.9                                                                              | 46.7                                                                              | 22.7                                                                              | 29.8                                                                              | 40.9                                                                                | 16.4                                                                                | 50.1                                                                                | 16.5                                                                                | 7.7                                                                                 |
| Level of Service       | F                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | C                                                                                 | C                                                                                 | D                                                                                   | B                                                                                   | D                                                                                   | B                                                                                   | A                                                                                   |
| Approach Delay (s)     |                                                                                   | 70.1                                                                              |                                                                                   |                                                                                   | 33.3                                                                              |                                                                                   |                                                                                   | 38.2                                                                                |                                                                                     |                                                                                     | 22.4                                                                                |                                                                                     |
| Approach LOS           |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | D                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |

### Intersection Summary

|                                   |       |                      |     |
|-----------------------------------|-------|----------------------|-----|
| HCM Average Control Delay         | 31.5  | HCM Level of Service | C   |
| HCM Volume to Capacity ratio      | 0.89  |                      |     |
| Actuated Cycle Length (s)         | 120.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 86.2% | ICU Level of Service | E   |
| Analysis Period (min)             | 15    |                      |     |
| c Critical Lane Group             |       |                      |     |

# Timings

## 1: Los Volcanes Rd & Unser Blvd

Terry O. Brown, P.E.

12/29/2010 - Synchro 7



| Lane Group           | EBL  | EBT   | WBL   | WBT   | WBR   | NBL   | NBT   | NBR   | SBL   | SBT   | SBR   |
|----------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  |      |       |       |       |       |       |       |       |       |       |       |
| Volume (vph)         | 182  | 143   | 94    | 48    | 152   | 45    | 1253  | 147   | 462   | 1614  | 220   |
| Turn Type            | Prot |       | pm+pt |       | pm+ov | pm+pt |       | pm+ov | pm+pt |       | pm+ov |
| Protected Phases     | 7    | 4     | 3     | 8     | 1     | 5     | 2     | 3     | 1     | 6     | 7     |
| Permitted Phases     |      |       | 8     |       | 8     | 2     |       | 2     | 6     |       | 6     |
| Detector Phase       | 7    | 4     | 3     | 8     | 1     | 5     | 2     | 3     | 1     | 6     | 7     |
| Switch Phase         |      |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 10.0 | 21.0  | 10.0  | 21.0  | 10.0  | 10.0  | 21.0  | 10.0  | 10.0  | 21.0  | 10.0  |
| Total Split (s)      | 11.0 | 22.0  | 10.0  | 21.0  | 36.0  | 10.0  | 52.0  | 10.0  | 36.0  | 78.0  | 11.0  |
| Total Split (%)      | 9.2% | 18.3% | 8.3%  | 17.5% | 30.0% | 8.3%  | 43.3% | 8.3%  | 30.0% | 65.0% | 9.2%  |
| Yellow Time (s)      | 4.0  | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 1.0  | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   | 1.0   |
| Lost Time Adjust (s) | -2.0 | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  | -2.0  |
| Total Lost Time (s)  | 3.0  | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   |
| Lead/Lag             | Lead | Lag   | Lead  | Lag   | Lead  | Lead  | Lag   | Lead  | Lead  | Lag   | Lead  |
| Lead-Lag Optimize?   |      |       |       |       |       |       |       |       |       |       |       |
| Recall Mode          | Min  | Min   | Min   | Min   | Min   | Min   | C-Max | Min   | Min   | C-Max | Min   |
| Act Effct Green (s)  | 8.0  | 17.3  | 23.3  | 16.3  | 54.0  | 56.3  | 49.0  | 59.0  | 86.7  | 76.4  | 87.4  |
| Actuated g/C Ratio   | 0.07 | 0.14  | 0.19  | 0.14  | 0.45  | 0.47  | 0.41  | 0.49  | 0.72  | 0.64  | 0.73  |
| v/c Ratio            | 0.86 | 0.71  | 0.68  | 0.25  | 0.29  | 0.30  | 0.97  | 0.20  | 0.96  | 0.85  | 0.22  |
| Control Delay        | 88.5 | 61.7  | 58.6  | 48.3  | 21.0  | 29.8  | 40.6  | 6.6   | 53.5  | 17.7  | 2.3   |
| Queue Delay          | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 88.5 | 61.7  | 58.6  | 48.3  | 21.0  | 29.8  | 40.6  | 6.6   | 53.5  | 17.7  | 2.3   |
| LOS                  | F    | E     | E     | D     | C     | C     | D     | A     | D     | B     | A     |
| Approach Delay       |      | 75.4  |       | 37.4  |       |       | 36.8  |       |       | 23.4  |       |
| Approach LOS         |      | E     |       | D     |       |       | D     |       |       | C     |       |

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 74 (62%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 32.7

Intersection LOS: C

Intersection Capacity Utilization 88.3%

ICU Level of Service E

Analysis Period (min) 15

### Splits and Phases: 1: Los Volcanes Rd & Unser Blvd

|      |      |      |      |
|------|------|------|------|
|      |      |      |      |
| ø1   | ø2   | ø3   | ø4   |
| 36 s | 52 s | 10 s | 22 s |
|      |      |      |      |
| ø5   | ø6   | ø7   | ø8   |
| 10 s | 78 s | 11 s | 21 s |

2012 AM Peak BUILD Conditions

Existing Geometry

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# HCM Signalized Intersection Capacity Analysis

## 1: Los Volcanes Rd & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                        |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement               | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations    |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Volume (vph)           | 182                                                                               | 143                                                                               | 33                                                                                | 94                                                                                | 48                                                                                | 152                                                                               | 45                                                                                 | 1253                                                                                | 147                                                                                 | 462                                                                                 | 1614                                                                                | 220                                                                                 |
| Ideal Flow (vphpl)     | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)    | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lane Util. Factor      | 0.97                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |
| Frt                    | 1.00                                                                              | 0.97                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.85                                                                              | 1.00                                                                               | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 1.00                                                                                | 0.85                                                                                |
| Flt Protected          | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              | 1.00                                                                              | 0.95                                                                               | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (prot)      | 3400                                                                              | 1793                                                                              |                                                                                   | 1752                                                                              | 1845                                                                              | 1568                                                                              | 1752                                                                               | 3505                                                                                | 1568                                                                                | 1752                                                                                | 3505                                                                                | 1568                                                                                |
| Flt Permitted          | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.32                                                                              | 1.00                                                                              | 1.00                                                                              | 0.08                                                                               | 1.00                                                                                | 1.00                                                                                | 0.08                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (perm)      | 3400                                                                              | 1793                                                                              |                                                                                   | 596                                                                               | 1845                                                                              | 1568                                                                              | 151                                                                                | 3505                                                                                | 1568                                                                                | 142                                                                                 | 3505                                                                                | 1568                                                                                |
| Peak-hour factor, PHF  | 0.93                                                                              | 0.93                                                                              | 0.93                                                                              | 0.75                                                                              | 0.75                                                                              | 0.75                                                                              | 0.90                                                                               | 0.90                                                                                | 0.90                                                                                | 0.85                                                                                | 0.85                                                                                | 0.85                                                                                |
| Adj. Flow (vph)        | 196                                                                               | 154                                                                               | 35                                                                                | 125                                                                               | 64                                                                                | 203                                                                               | 50                                                                                 | 1392                                                                                | 163                                                                                 | 544                                                                                 | 1899                                                                                | 259                                                                                 |
| RTOR Reduction (vph)   | 0                                                                                 | 7                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 6                                                                                 | 0                                                                                  | 0                                                                                   | 49                                                                                  | 0                                                                                   | 0                                                                                   | 57                                                                                  |
| Lane Group Flow (vph)  | 196                                                                               | 182                                                                               | 0                                                                                 | 125                                                                               | 64                                                                                | 197                                                                               | 50                                                                                 | 1392                                                                                | 114                                                                                 | 544                                                                                 | 1899                                                                                | 202                                                                                 |
| Turn Type              | Prot                                                                              |                                                                                   |                                                                                   | pm+pt                                                                             |                                                                                   | pm+ov                                                                             | pm+pt                                                                              |                                                                                     | pm+ov                                                                               | pm+pt                                                                               |                                                                                     | pm+ov                                                                               |
| Protected Phases       | 7                                                                                 | 4                                                                                 |                                                                                   | 3                                                                                 | 8                                                                                 | 1                                                                                 | 5                                                                                  | 2                                                                                   | 3                                                                                   | 1                                                                                   | 6                                                                                   | 7                                                                                   |
| Permitted Phases       |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 8                                                                                 | 2                                                                                  |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     | 6                                                                                   |
| Actuated Green, G (s)  | 6.0                                                                               | 15.3                                                                              |                                                                                   | 19.3                                                                              | 14.3                                                                              | 47.0                                                                              | 52.3                                                                               | 47.0                                                                                | 52.0                                                                                | 84.7                                                                                | 74.4                                                                                | 80.4                                                                                |
| Effective Green, g (s) | 8.0                                                                               | 17.3                                                                              |                                                                                   | 23.3                                                                              | 16.3                                                                              | 51.0                                                                              | 56.3                                                                               | 49.0                                                                                | 56.0                                                                                | 86.7                                                                                | 76.4                                                                                | 84.4                                                                                |
| Actuated g/C Ratio     | 0.07                                                                              | 0.14                                                                              |                                                                                   | 0.19                                                                              | 0.14                                                                              | 0.42                                                                              | 0.47                                                                               | 0.41                                                                                | 0.47                                                                                | 0.72                                                                                | 0.64                                                                                | 0.70                                                                                |
| Clearance Time (s)     | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 |
| Vehicle Extension (s)  | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lane Grp Cap (vph)     | 227                                                                               | 258                                                                               |                                                                                   | 183                                                                               | 251                                                                               | 706                                                                               | 168                                                                                | 1431                                                                                | 771                                                                                 | 568                                                                                 | 2232                                                                                | 1142                                                                                |
| v/s Ratio Prot         | c0.06                                                                             | c0.10                                                                             |                                                                                   | 0.04                                                                              | 0.03                                                                              | 0.08                                                                              | 0.02                                                                               | 0.40                                                                                | 0.01                                                                                | c0.28                                                                               | 0.54                                                                                | 0.01                                                                                |
| v/s Ratio Perm         |                                                                                   |                                                                                   |                                                                                   | 0.09                                                                              |                                                                                   | 0.04                                                                              | 0.12                                                                               |                                                                                     | 0.06                                                                                | c0.42                                                                               |                                                                                     | 0.12                                                                                |
| v/c Ratio              | 0.86                                                                              | 0.71                                                                              |                                                                                   | 0.68                                                                              | 0.25                                                                              | 0.28                                                                              | 0.30                                                                               | 0.97                                                                                | 0.15                                                                                | 0.96                                                                                | 0.85                                                                                | 0.18                                                                                |
| Uniform Delay, d1      | 55.5                                                                              | 48.9                                                                              |                                                                                   | 42.7                                                                              | 46.4                                                                              | 22.5                                                                              | 20.3                                                                               | 34.8                                                                                | 18.3                                                                                | 36.0                                                                                | 17.3                                                                                | 6.0                                                                                 |
| Progression Factor     | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 2.03                                                                               | 0.75                                                                                | 0.81                                                                                | 0.86                                                                                | 0.80                                                                                | 1.31                                                                                |
| Incremental Delay, d2  | 27.0                                                                              | 8.5                                                                               |                                                                                   | 10.1                                                                              | 0.5                                                                               | 0.2                                                                               | 0.6                                                                                | 13.7                                                                                | 0.1                                                                                 | 21.8                                                                                | 3.1                                                                                 | 0.1                                                                                 |
| Delay (s)              | 82.5                                                                              | 57.4                                                                              |                                                                                   | 52.7                                                                              | 47.0                                                                              | 22.7                                                                              | 41.8                                                                               | 39.7                                                                                | 15.0                                                                                | 52.8                                                                                | 16.9                                                                                | 8.0                                                                                 |
| Level of Service       | F                                                                                 | E                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | C                                                                                 | D                                                                                  | D                                                                                   | B                                                                                   | D                                                                                   | B                                                                                   | A                                                                                   |
| Approach Delay (s)     |                                                                                   | 70.2                                                                              |                                                                                   |                                                                                   | 36.2                                                                              |                                                                                   |                                                                                    | 37.2                                                                                |                                                                                     |                                                                                     | 23.3                                                                                |                                                                                     |
| Approach LOS           |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | D                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |

### Intersection Summary

|                                   |       |                      |     |
|-----------------------------------|-------|----------------------|-----|
| HCM Average Control Delay         | 32.2  | HCM Level of Service | C   |
| HCM Volume to Capacity ratio      | 0.89  |                      |     |
| Actuated Cycle Length (s)         | 120.0 | Sum of lost time (s) | 6.0 |
| Intersection Capacity Utilization | 88.3% | ICU Level of Service | E   |
| Analysis Period (min)             | 15    |                      |     |
| c Critical Lane Group             |       |                      |     |

# Timings

## 1: Los Volcanes Rd & Unser Blvd

Terry O. Brown, P.E.

12/29/2010 - Synchro 7

|                      |  |  |  |  |  |  |   |  |  |  |  |
|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group           | EBL                                                                               | EBT                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations  |  |  |  |  |  |  |  |  |  |  |  |
| Volume (vph)         | 113                                                                               | 21                                                                                | 180                                                                               | 23                                                                                | 269                                                                               | 11                                                                                | 1184                                                                                | 137                                                                                 | 223                                                                                 | 1167                                                                                | 111                                                                                 |
| Turn Type            | Prot                                                                              |                                                                                   | pm+pt                                                                             |                                                                                   | pm+ov                                                                             | pm+pt                                                                             |                                                                                     | pm+ov                                                                               | pm+pt                                                                               |                                                                                     | pm+ov                                                                               |
| Protected Phases     | 7                                                                                 | 4                                                                                 | 3                                                                                 | 8                                                                                 | 1                                                                                 | 5                                                                                 | 2                                                                                   | 3                                                                                   | 1                                                                                   | 6                                                                                   | 7                                                                                   |
| Permitted Phases     |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 8                                                                                 | 2                                                                                 |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     | 6                                                                                   |
| Detector Phase       | 7                                                                                 | 4                                                                                 | 3                                                                                 | 8                                                                                 | 1                                                                                 | 5                                                                                 | 2                                                                                   | 3                                                                                   | 1                                                                                   | 6                                                                                   | 7                                                                                   |
| Switch Phase         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Minimum Initial (s)  | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 |
| Minimum Split (s)    | 10.0                                                                              | 21.0                                                                              | 10.0                                                                              | 21.0                                                                              | 10.0                                                                              | 10.0                                                                              | 21.0                                                                                | 10.0                                                                                | 10.0                                                                                | 21.0                                                                                | 10.0                                                                                |
| Total Split (s)      | 11.0                                                                              | 21.0                                                                              | 11.0                                                                              | 21.0                                                                              | 22.0                                                                              | 10.0                                                                              | 56.0                                                                                | 11.0                                                                                | 22.0                                                                                | 68.0                                                                                | 11.0                                                                                |
| Total Split (%)      | 10.0%                                                                             | 19.1%                                                                             | 10.0%                                                                             | 19.1%                                                                             | 20.0%                                                                             | 9.1%                                                                              | 50.9%                                                                               | 10.0%                                                                               | 20.0%                                                                               | 61.8%                                                                               | 10.0%                                                                               |
| Yellow Time (s)      | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 |
| All-Red Time (s)     | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 |
| Lost Time Adjust (s) | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                |
| Total Lost Time (s)  | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lead/Lag             | Lead                                                                              | Lag                                                                               | Lead                                                                              | Lag                                                                               | Lead                                                                              | Lead                                                                              | Lag                                                                                 | Lead                                                                                | Lead                                                                                | Lag                                                                                 | Lead                                                                                |
| Lead-Lag Optimize?   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Recall Mode          | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | C-Max                                                                               | Min                                                                                 | Min                                                                                 | C-Max                                                                               | Min                                                                                 |
| Act Effct Green (s)  | 8.0                                                                               | 9.4                                                                               | 17.4                                                                              | 9.4                                                                               | 29.5                                                                              | 71.2                                                                              | 63.5                                                                                | 74.5                                                                                | 83.5                                                                                | 72.9                                                                                | 83.9                                                                                |
| Actuated g/C Ratio   | 0.07                                                                              | 0.09                                                                              | 0.16                                                                              | 0.09                                                                              | 0.27                                                                              | 0.65                                                                              | 0.58                                                                                | 0.68                                                                                | 0.76                                                                                | 0.66                                                                                | 0.76                                                                                |
| v/c Ratio            | 0.51                                                                              | 0.27                                                                              | 0.79                                                                              | 0.15                                                                              | 0.64                                                                              | 0.04                                                                              | 0.64                                                                                | 0.14                                                                                | 0.59                                                                                | 0.55                                                                                | 0.10                                                                                |
| Control Delay        | 57.0                                                                              | 33.2                                                                              | 65.2                                                                              | 48.0                                                                              | 36.4                                                                              | 4.6                                                                               | 13.6                                                                                | 1.6                                                                                 | 13.5                                                                                | 9.1                                                                                 | 1.4                                                                                 |
| Queue Delay          | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Total Delay          | 57.0                                                                              | 33.2                                                                              | 65.2                                                                              | 48.0                                                                              | 36.4                                                                              | 4.6                                                                               | 13.6                                                                                | 1.6                                                                                 | 13.5                                                                                | 9.1                                                                                 | 1.4                                                                                 |
| LOS                  | E                                                                                 | C                                                                                 | E                                                                                 | D                                                                                 | D                                                                                 | A                                                                                 | B                                                                                   | A                                                                                   | B                                                                                   | A                                                                                   | A                                                                                   |
| Approach Delay       |                                                                                   | 50.7                                                                              |                                                                                   | 47.9                                                                              |                                                                                   |                                                                                   | 12.3                                                                                |                                                                                     |                                                                                     | 9.2                                                                                 |                                                                                     |
| Approach LOS         |                                                                                   | D                                                                                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |

### Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 48 (44%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 17.5

Intersection LOS: B

Intersection Capacity Utilization 71.7%

ICU Level of Service C

Analysis Period (min) 15

### Splits and Phases: 1: Los Volcanes Rd & Unser Blvd

|                                                                                     |                                                                                     |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |
| ø1                                                                                  | ø2                                                                                  | ø3                                                                                    | ø4                                                                                    |
| 22 s                                                                                | 56 s                                                                                | 11 s                                                                                  | 21 s                                                                                  |
|  |  |  |  |
| ø5                                                                                  | ø6                                                                                  | ø7                                                                                    | ø8                                                                                    |
| 10 s                                                                                | 68 s                                                                                | 11 s                                                                                  | 21 s                                                                                  |

2012 PM Peak NO BUILD Conditions

Existing Geometry  
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# HCM Signalized Intersection Capacity Analysis

## 1: Los Volcanes Rd & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                        |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement               | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations    |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Volume (vph)           | 113                                                                               | 21                                                                                | 19                                                                                | 180                                                                               | 23                                                                                | 269                                                                               | 11                                                                                 | 1184                                                                                | 137                                                                                 | 223                                                                                 | 1167                                                                                | 111                                                                                 |
| Ideal Flow (vphpl)     | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)    | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lane Util. Factor      | 0.97                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |
| Frt                    | 1.00                                                                              | 0.93                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.85                                                                              | 1.00                                                                               | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 1.00                                                                                | 0.85                                                                                |
| Flt Protected          | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              | 1.00                                                                              | 0.95                                                                               | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (prot)      | 3400                                                                              | 1716                                                                              |                                                                                   | 1752                                                                              | 1845                                                                              | 1568                                                                              | 1752                                                                               | 3505                                                                                | 1568                                                                                | 1752                                                                                | 3505                                                                                | 1568                                                                                |
| Flt Permitted          | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.73                                                                              | 1.00                                                                              | 1.00                                                                              | 0.19                                                                               | 1.00                                                                                | 1.00                                                                                | 0.12                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (perm)      | 3400                                                                              | 1716                                                                              |                                                                                   | 1342                                                                              | 1845                                                                              | 1568                                                                              | 345                                                                                | 3505                                                                                | 1568                                                                                | 223                                                                                 | 3505                                                                                | 1568                                                                                |
| Peak-hour factor, PHF  | 0.89                                                                              | 0.89                                                                              | 0.89                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.91                                                                               | 0.91                                                                                | 0.91                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)        | 127                                                                               | 24                                                                                | 21                                                                                | 191                                                                               | 24                                                                                | 286                                                                               | 12                                                                                 | 1301                                                                                | 151                                                                                 | 242                                                                                 | 1268                                                                                | 121                                                                                 |
| RTOR Reduction (vph)   | 0                                                                                 | 19                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 28                                                                                | 0                                                                                  | 0                                                                                   | 42                                                                                  | 0                                                                                   | 0                                                                                   | 32                                                                                  |
| Lane Group Flow (vph)  | 127                                                                               | 26                                                                                | 0                                                                                 | 191                                                                               | 24                                                                                | 258                                                                               | 12                                                                                 | 1301                                                                                | 109                                                                                 | 242                                                                                 | 1268                                                                                | 89                                                                                  |
| Turn Type              | Prot                                                                              |                                                                                   |                                                                                   | pm+pt                                                                             |                                                                                   | pm+ov                                                                             | pm+pt                                                                              |                                                                                     | pm+ov                                                                               | pm+pt                                                                               |                                                                                     | pm+ov                                                                               |
| Protected Phases       | 7                                                                                 | 4                                                                                 |                                                                                   | 3                                                                                 | 8                                                                                 | 1                                                                                 | 5                                                                                  | 2                                                                                   | 3                                                                                   | 1                                                                                   | 6                                                                                   | 7                                                                                   |
| Permitted Phases       |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 8                                                                                 | 2                                                                                  |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     | 6                                                                                   |
| Actuated Green, G (s)  | 6.0                                                                               | 7.4                                                                               |                                                                                   | 13.4                                                                              | 7.4                                                                               | 22.6                                                                              | 67.1                                                                               | 61.4                                                                                | 67.4                                                                                | 81.6                                                                                | 70.9                                                                                | 76.9                                                                                |
| Effective Green, g (s) | 8.0                                                                               | 9.4                                                                               |                                                                                   | 17.4                                                                              | 9.4                                                                               | 26.6                                                                              | 71.1                                                                               | 63.4                                                                                | 71.4                                                                                | 83.6                                                                                | 72.9                                                                                | 80.9                                                                                |
| Actuated g/C Ratio     | 0.07                                                                              | 0.09                                                                              |                                                                                   | 0.16                                                                              | 0.09                                                                              | 0.24                                                                              | 0.65                                                                               | 0.58                                                                                | 0.65                                                                                | 0.76                                                                                | 0.66                                                                                | 0.74                                                                                |
| Clearance Time (s)     | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 |
| Vehicle Extension (s)  | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lane Grp Cap (vph)     | 247                                                                               | 147                                                                               |                                                                                   | 242                                                                               | 158                                                                               | 422                                                                               | 321                                                                                | 2020                                                                                | 1061                                                                                | 409                                                                                 | 2323                                                                                | 1196                                                                                |
| v/s Ratio Prot         | 0.04                                                                              | 0.02                                                                              |                                                                                   | c0.06                                                                             | 0.01                                                                              | c0.10                                                                             | 0.00                                                                               | c0.37                                                                               | 0.01                                                                                | 0.09                                                                                | 0.36                                                                                | 0.01                                                                                |
| v/s Ratio Perm         |                                                                                   |                                                                                   |                                                                                   | c0.07                                                                             |                                                                                   | 0.07                                                                              | 0.02                                                                               |                                                                                     | 0.06                                                                                | 0.36                                                                                |                                                                                     | 0.05                                                                                |
| v/c Ratio              | 0.51                                                                              | 0.18                                                                              |                                                                                   | 0.79                                                                              | 0.15                                                                              | 0.61                                                                              | 0.04                                                                               | 0.64                                                                                | 0.10                                                                                | 0.59                                                                                | 0.55                                                                                | 0.07                                                                                |
| Uniform Delay, d1      | 49.1                                                                              | 46.7                                                                              |                                                                                   | 43.9                                                                              | 46.6                                                                              | 37.1                                                                              | 7.3                                                                                | 15.7                                                                                | 7.3                                                                                 | 14.7                                                                                | 9.8                                                                                 | 4.1                                                                                 |
| Progression Factor     | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.87                                                                               | 0.71                                                                                | 0.56                                                                                | 0.83                                                                                | 0.82                                                                                | 1.66                                                                                |
| Incremental Delay, d2  | 1.8                                                                               | 0.6                                                                               |                                                                                   | 15.6                                                                              | 0.4                                                                               | 2.6                                                                               | 0.0                                                                                | 1.4                                                                                 | 0.0                                                                                 | 1.8                                                                                 | 0.7                                                                                 | 0.0                                                                                 |
| Delay (s)              | 50.9                                                                              | 47.3                                                                              |                                                                                   | 59.5                                                                              | 47.1                                                                              | 39.7                                                                              | 6.5                                                                                | 12.5                                                                                | 4.1                                                                                 | 14.1                                                                                | 8.8                                                                                 | 6.8                                                                                 |
| Level of Service       | D                                                                                 | D                                                                                 |                                                                                   | E                                                                                 | D                                                                                 | D                                                                                 | A                                                                                  | B                                                                                   | A                                                                                   | B                                                                                   | A                                                                                   | A                                                                                   |
| Approach Delay (s)     |                                                                                   | 50.0                                                                              |                                                                                   |                                                                                   | 47.6                                                                              |                                                                                   |                                                                                    | 11.6                                                                                |                                                                                     |                                                                                     | 9.4                                                                                 |                                                                                     |
| Approach LOS           |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |

### Intersection Summary

|                                   |       |                      |     |
|-----------------------------------|-------|----------------------|-----|
| HCM Average Control Delay         | 17.2  | HCM Level of Service | B   |
| HCM Volume to Capacity ratio      | 0.66  |                      |     |
| Actuated Cycle Length (s)         | 110.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 71.7% | ICU Level of Service | C   |
| Analysis Period (min)             | 15    |                      |     |
| c Critical Lane Group             |       |                      |     |

2012 PM Peak NO BUILD Conditions

Existing Geometry  
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Timings  
1: Los Volcanes Rd & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                      |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group           | EBL                                                                               | EBT                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations  |  |  |  |  |  |  |  |  |  |  |  |
| Volume (vph)         | 136                                                                               | 38                                                                                | 180                                                                               | 40                                                                                | 269                                                                               | 36                                                                                | 1171                                                                              | 137                                                                                 | 223                                                                                 | 1163                                                                                | 115                                                                                 |
| Turn Type            | Prot                                                                              |                                                                                   | pm+pt                                                                             |                                                                                   | pm+ov                                                                             | pm+pt                                                                             |                                                                                   | pm+ov                                                                               | pm+pt                                                                               |                                                                                     | pm+ov                                                                               |
| Protected Phases     | 7                                                                                 | 4                                                                                 | 3                                                                                 | 8                                                                                 | 1                                                                                 | 5                                                                                 | 2                                                                                 | 3                                                                                   | 1                                                                                   | 6                                                                                   | 7                                                                                   |
| Permitted Phases     |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 8                                                                                 | 2                                                                                 |                                                                                   | 2                                                                                   | 6                                                                                   |                                                                                     | 6                                                                                   |
| Detector Phase       | 7                                                                                 | 4                                                                                 | 3                                                                                 | 8                                                                                 | 1                                                                                 | 5                                                                                 | 2                                                                                 | 3                                                                                   | 1                                                                                   | 6                                                                                   | 7                                                                                   |
| Switch Phase         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Minimum Initial (s)  | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 |
| Minimum Split (s)    | 10.0                                                                              | 21.0                                                                              | 10.0                                                                              | 21.0                                                                              | 10.0                                                                              | 10.0                                                                              | 21.0                                                                              | 10.0                                                                                | 10.0                                                                                | 21.0                                                                                | 10.0                                                                                |
| Total Split (s)      | 14.0                                                                              | 21.0                                                                              | 16.0                                                                              | 23.0                                                                              | 25.0                                                                              | 10.0                                                                              | 58.0                                                                              | 16.0                                                                                | 25.0                                                                                | 73.0                                                                                | 14.0                                                                                |
| Total Split (%)      | 11.7%                                                                             | 17.5%                                                                             | 13.3%                                                                             | 19.2%                                                                             | 20.8%                                                                             | 8.3%                                                                              | 48.3%                                                                             | 13.3%                                                                               | 20.8%                                                                               | 60.8%                                                                               | 11.7%                                                                               |
| Yellow Time (s)      | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 |
| All-Red Time (s)     | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 |
| Lost Time Adjust (s) | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                |
| Total Lost Time (s)  | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lead/Lag             | Lead                                                                              | Lag                                                                               | Lead                                                                              | Lag                                                                               | Lead                                                                              | Lead                                                                              | Lag                                                                               | Lead                                                                                | Lead                                                                                | Lag                                                                                 | Lead                                                                                |
| Lead-Lag Optimize?   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Recall Mode          | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | C-Max                                                                             | Min                                                                                 | Min                                                                                 | C-Max                                                                               | Min                                                                                 |
| Act Effct Green (s)  | 10.7                                                                              | 11.4                                                                              | 26.6                                                                              | 13.6                                                                              | 35.0                                                                              | 73.5                                                                              | 65.2                                                                              | 81.2                                                                                | 86.6                                                                                | 75.4                                                                                | 89.1                                                                                |
| Actuated g/C Ratio   | 0.09                                                                              | 0.10                                                                              | 0.22                                                                              | 0.11                                                                              | 0.29                                                                              | 0.61                                                                              | 0.54                                                                              | 0.68                                                                                | 0.72                                                                                | 0.63                                                                                | 0.74                                                                                |
| v/c Ratio            | 0.50                                                                              | 0.47                                                                              | 0.69                                                                              | 0.20                                                                              | 0.59                                                                              | 0.13                                                                              | 0.68                                                                              | 0.14                                                                                | 0.63                                                                                | 0.57                                                                                | 0.10                                                                                |
| Control Delay        | 58.1                                                                              | 36.8                                                                              | 53.1                                                                              | 49.4                                                                              | 35.3                                                                              | 6.2                                                                               | 16.5                                                                              | 1.6                                                                                 | 22.0                                                                                | 14.3                                                                                | 0.4                                                                                 |
| Queue Delay          | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Total Delay          | 58.1                                                                              | 36.8                                                                              | 53.1                                                                              | 49.4                                                                              | 35.3                                                                              | 6.2                                                                               | 16.5                                                                              | 1.6                                                                                 | 22.0                                                                                | 14.3                                                                                | 0.4                                                                                 |
| LOS                  | E                                                                                 | D                                                                                 | D                                                                                 | D                                                                                 | D                                                                                 | A                                                                                 | B                                                                                 | A                                                                                   | C                                                                                   | B                                                                                   | A                                                                                   |
| Approach Delay       |                                                                                   | 50.0                                                                              |                                                                                   | 43.0                                                                              |                                                                                   |                                                                                   | 14.7                                                                              |                                                                                     |                                                                                     | 14.4                                                                                |                                                                                     |
| Approach LOS         |                                                                                   | D                                                                                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 33 (28%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 20.6

Intersection Capacity Utilization 71.4%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service C

Splits and Phases: 1: Los Volcanes Rd & Unser Blvd

|                                                                                     |                                                                                     |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |
| ø1                                                                                  | ø2                                                                                  | ø3                                                                                    | ø4                                                                                    |
| 25 s                                                                                | 58 s                                                                                | 16 s                                                                                  | 21 s                                                                                  |
|  |  |  |  |
| ø5                                                                                  | ø6                                                                                  | ø7                                                                                    | ø8                                                                                    |
| 10 s                                                                                | 73 s                                                                                | 14 s                                                                                  | 23 s                                                                                  |

2012 PM Peak BUILD Conditions

Existing Geometry

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# HCM Signalized Intersection Capacity Analysis 1: Los Volcanes Rd & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |  |  |  |  |  |  |   |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Volume (vph)                      | 136                                                                               | 38                                                                                | 46                                                                                | 180                                                                               | 40                                                                                | 269                                                                               | 36                                                                                  | 1171                                                                                | 137                                                                                 | 223                                                                                 | 1163                                                                                | 115                                                                                 |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lane Util. Factor                 | 0.97                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |
| Frt                               | 1.00                                                                              | 0.92                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.85                                                                              | 1.00                                                                                | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 1.00                                                                                | 0.85                                                                                |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              | 1.00                                                                              | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (prot)                 | 3400                                                                              | 1693                                                                              |                                                                                   | 1752                                                                              | 1845                                                                              | 1568                                                                              | 1752                                                                                | 3505                                                                                | 1568                                                                                | 1752                                                                                | 3505                                                                                | 1568                                                                                |
| Flt Permitted                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.42                                                                              | 1.00                                                                              | 1.00                                                                              | 0.18                                                                                | 1.00                                                                                | 1.00                                                                                | 0.11                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (perm)                 | 3400                                                                              | 1693                                                                              |                                                                                   | 782                                                                               | 1845                                                                              | 1568                                                                              | 325                                                                                 | 3505                                                                                | 1568                                                                                | 204                                                                                 | 3505                                                                                | 1568                                                                                |
| Peak-hour factor, PHF             | 0.89                                                                              | 0.89                                                                              | 0.89                                                                              | 0.94                                                                              | 0.94                                                                              | 0.94                                                                              | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)                   | 153                                                                               | 43                                                                                | 52                                                                                | 191                                                                               | 43                                                                                | 286                                                                               | 40                                                                                  | 1287                                                                                | 151                                                                                 | 242                                                                                 | 1264                                                                                | 125                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 39                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 28                                                                                | 0                                                                                   | 0                                                                                   | 40                                                                                  | 0                                                                                   | 0                                                                                   | 35                                                                                  |
| Lane Group Flow (vph)             | 153                                                                               | 56                                                                                | 0                                                                                 | 191                                                                               | 43                                                                                | 258                                                                               | 40                                                                                  | 1287                                                                                | 111                                                                                 | 242                                                                                 | 1264                                                                                | 90                                                                                  |
| Turn Type                         | Prot                                                                              |                                                                                   |                                                                                   | pm+pt                                                                             |                                                                                   | pm+ov                                                                             | pm+pt                                                                               |                                                                                     | pm+ov                                                                               | pm+pt                                                                               |                                                                                     | pm+ov                                                                               |
| Protected Phases                  | 7                                                                                 | 4                                                                                 |                                                                                   | 3                                                                                 | 8                                                                                 | 1                                                                                 | 5                                                                                   | 2                                                                                   | 3                                                                                   | 1                                                                                   | 6                                                                                   | 7                                                                                   |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 8                                                                                 | 2                                                                                   |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     | 6                                                                                   |
| Actuated Green, G (s)             | 8.7                                                                               | 9.4                                                                               |                                                                                   | 22.7                                                                              | 11.7                                                                              | 28.1                                                                              | 69.4                                                                                | 63.2                                                                                | 74.2                                                                                | 84.6                                                                                | 73.4                                                                                | 82.1                                                                                |
| Effective Green, g (s)            | 10.7                                                                              | 11.4                                                                              |                                                                                   | 26.7                                                                              | 13.7                                                                              | 32.1                                                                              | 73.4                                                                                | 65.2                                                                                | 78.2                                                                                | 86.6                                                                                | 75.4                                                                                | 86.1                                                                                |
| Actuated g/C Ratio                | 0.09                                                                              | 0.10                                                                              |                                                                                   | 0.22                                                                              | 0.11                                                                              | 0.27                                                                              | 0.61                                                                                | 0.54                                                                                | 0.65                                                                                | 0.72                                                                                | 0.63                                                                                | 0.72                                                                                |
| Clearance Time (s)                | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lane Grp Cap (vph)                | 303                                                                               | 161                                                                               |                                                                                   | 279                                                                               | 211                                                                               | 459                                                                               | 296                                                                                 | 1904                                                                                | 1061                                                                                | 385                                                                                 | 2202                                                                                | 1164                                                                                |
| v/s Ratio Prot                    | 0.05                                                                              | 0.03                                                                              |                                                                                   | c0.07                                                                             | 0.02                                                                              | c0.09                                                                             | 0.01                                                                                | c0.37                                                                               | 0.01                                                                                | c0.10                                                                               | 0.36                                                                                | 0.01                                                                                |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   | c0.08                                                                             |                                                                                   | 0.08                                                                              | 0.07                                                                                |                                                                                     | 0.06                                                                                | 0.36                                                                                |                                                                                     | 0.05                                                                                |
| v/c Ratio                         | 0.50                                                                              | 0.35                                                                              |                                                                                   | 0.68                                                                              | 0.20                                                                              | 0.56                                                                              | 0.14                                                                                | 0.68                                                                                | 0.10                                                                                | 0.63                                                                                | 0.57                                                                                | 0.08                                                                                |
| Uniform Delay, d1                 | 52.1                                                                              | 50.8                                                                              |                                                                                   | 40.8                                                                              | 48.2                                                                              | 37.9                                                                              | 10.0                                                                                | 19.8                                                                                | 7.8                                                                                 | 19.8                                                                                | 13.0                                                                                | 5.1                                                                                 |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.78                                                                                | 0.68                                                                                | 0.47                                                                                | 1.10                                                                                | 0.98                                                                                | 0.30                                                                                |
| Incremental Delay, d2             | 1.3                                                                               | 1.3                                                                               |                                                                                   | 6.8                                                                               | 0.5                                                                               | 1.6                                                                               | 0.2                                                                                 | 1.7                                                                                 | 0.0                                                                                 | 2.6                                                                                 | 0.9                                                                                 | 0.0                                                                                 |
| Delay (s)                         | 53.4                                                                              | 52.1                                                                              |                                                                                   | 47.6                                                                              | 48.7                                                                              | 39.5                                                                              | 8.0                                                                                 | 15.3                                                                                | 3.7                                                                                 | 24.4                                                                                | 13.6                                                                                | 1.5                                                                                 |
| Level of Service                  | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | D                                                                                 | A                                                                                   | B                                                                                   | A                                                                                   | C                                                                                   | B                                                                                   | A                                                                                   |
| Approach Delay (s)                |                                                                                   | 52.9                                                                              |                                                                                   |                                                                                   | 43.2                                                                              |                                                                                   |                                                                                     | 13.9                                                                                |                                                                                     |                                                                                     | 14.3                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM Average Control Delay         |                                                                                   |                                                                                   | 20.5                                                                              |                                                                                   |                                                                                   | HCM Level of Service                                                              |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM Volume to Capacity ratio      |                                                                                   |                                                                                   | 0.67                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 120.0                                                                             |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                     |                                                                                     | 9.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 71.4%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

2012 PM Peak BUILD Conditions

Existing Geometry  
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# Timings

## 2: Bluewater Rd & Unser Blvd

Terry O. Brown, P.E.

12/29/2010 - Synchro 7

|                      |  |  |  |  |  |  |   |  |  |  |  |  |
|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group           | EBL                                                                               | EBT                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |                                                                                     |
| Lane Configurations  |  |  |  |  |  |  |  |  |  |  |  |                                                                                     |
| Volume (vph)         | 184                                                                               | 81                                                                                | 48                                                                                | 49                                                                                | 55                                                                                | 75                                                                                | 1359                                                                                | 94                                                                                  | 161                                                                                 | 809                                                                                 | 106                                                                                 |                                                                                     |
| Turn Type            | pm+pt                                                                             |                                                                                   | Perm                                                                              |                                                                                   | Perm                                                                              | pm+pt                                                                             |                                                                                     | Perm                                                                                | pm+pt                                                                               |                                                                                     | Perm                                                                                |                                                                                     |
| Protected Phases     | 7                                                                                 | 4                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 5                                                                                 | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |                                                                                     |
| Permitted Phases     | 4                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 8                                                                                 | 2                                                                                 |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     | 6                                                                                   |                                                                                     |
| Detector Phase       | 7                                                                                 | 4                                                                                 | 8                                                                                 | 8                                                                                 | 8                                                                                 | 5                                                                                 | 2                                                                                   | 2                                                                                   | 1                                                                                   | 6                                                                                   | 6                                                                                   |                                                                                     |
| Switch Phase         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Minimum Initial (s)  | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 |                                                                                     |
| Minimum Split (s)    | 10.0                                                                              | 21.0                                                                              | 21.0                                                                              | 21.0                                                                              | 21.0                                                                              | 10.0                                                                              | 21.0                                                                                | 21.0                                                                                | 10.0                                                                                | 21.0                                                                                | 21.0                                                                                |                                                                                     |
| Total Split (s)      | 16.0                                                                              | 37.0                                                                              | 21.0                                                                              | 21.0                                                                              | 21.0                                                                              | 10.0                                                                              | 65.0                                                                                | 65.0                                                                                | 18.0                                                                                | 73.0                                                                                | 73.0                                                                                |                                                                                     |
| Total Split (%)      | 13.3%                                                                             | 30.8%                                                                             | 17.5%                                                                             | 17.5%                                                                             | 17.5%                                                                             | 8.3%                                                                              | 54.2%                                                                               | 54.2%                                                                               | 15.0%                                                                               | 60.8%                                                                               | 60.8%                                                                               |                                                                                     |
| Yellow Time (s)      | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 |                                                                                     |
| All-Red Time (s)     | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 |                                                                                     |
| Lost Time Adjust (s) | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                |                                                                                     |
| Total Lost Time (s)  | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Lead/Lag             | Lead                                                                              |                                                                                   | Lag                                                                               | Lag                                                                               | Lag                                                                               | Lead                                                                              | Lag                                                                                 | Lag                                                                                 | Lead                                                                                | Lag                                                                                 | Lag                                                                                 |                                                                                     |
| Lead-Lag Optimize?   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Recall Mode          | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | C-Max                                                                               | C-Max                                                                               | Min                                                                                 | C-Max                                                                               | C-Max                                                                               |                                                                                     |
| Act Effct Green (s)  | 29.6                                                                              | 29.6                                                                              | 13.6                                                                              | 13.6                                                                              | 13.6                                                                              | 75.8                                                                              | 67.5                                                                                | 67.5                                                                                | 84.1                                                                                | 73.1                                                                                | 73.1                                                                                |                                                                                     |
| Actuated g/C Ratio   | 0.25                                                                              | 0.25                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.63                                                                              | 0.56                                                                                | 0.56                                                                                | 0.70                                                                                | 0.61                                                                                | 0.61                                                                                |                                                                                     |
| v/c Ratio            | 0.68                                                                              | 0.44                                                                              | 0.48                                                                              | 0.31                                                                              | 0.30                                                                              | 0.21                                                                              | 0.75                                                                                | 0.11                                                                                | 0.66                                                                                | 0.45                                                                                | 0.12                                                                                |                                                                                     |
| Control Delay        | 49.6                                                                              | 32.1                                                                              | 61.1                                                                              | 51.5                                                                              | 13.7                                                                              | 7.9                                                                               | 23.4                                                                                | 7.9                                                                                 | 26.4                                                                                | 12.3                                                                                | 3.2                                                                                 |                                                                                     |
| Queue Delay          | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |
| Total Delay          | 49.6                                                                              | 32.1                                                                              | 61.1                                                                              | 51.5                                                                              | 13.7                                                                              | 7.9                                                                               | 23.4                                                                                | 7.9                                                                                 | 26.4                                                                                | 12.3                                                                                | 3.2                                                                                 |                                                                                     |
| LOS                  | D                                                                                 | C                                                                                 | E                                                                                 | D                                                                                 | B                                                                                 | A                                                                                 | C                                                                                   | A                                                                                   | C                                                                                   | B                                                                                   | A                                                                                   |                                                                                     |
| Approach Delay       |                                                                                   | 41.4                                                                              |                                                                                   | 40.9                                                                              |                                                                                   |                                                                                   | 21.7                                                                                |                                                                                     |                                                                                     | 13.5                                                                                |                                                                                     |                                                                                     |
| Approach LOS         |                                                                                   | D                                                                                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 6 (5%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 22.2

Intersection LOS: C

Intersection Capacity Utilization 74.2%

ICU Level of Service D

Analysis Period (min) 15

### Splits and Phases: 2: Bluewater Rd & Unser Blvd

|                                                                                     |                                                                                     |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |
| ø1                                                                                  | ø2                                                                                  | ø4                                                                                    |
| 18 s                                                                                | 65 s                                                                                | 37 s                                                                                  |
|  |  |  |
| ø5                                                                                  | ø6                                                                                  | ø7                                                                                    |
| 10 s                                                                                | 73 s                                                                                | 16 s                                                                                  |
|                                                                                     |                                                                                     | ø8                                                                                    |
|                                                                                     |                                                                                     | 21 s                                                                                  |

2012 AM Peak NO BUILD Conditions

Existing Geometry

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# HCM Signalized Intersection Capacity Analysis 2: Bluewater Rd & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Volume (vph)                      | 184                                                                               | 81                                                                                | 84                                                                                | 48                                                                                | 49                                                                                | 55                                                                                | 75                                                                                | 1359                                                                                | 94                                                                                  | 161                                                                                 | 809                                                                                 | 106                                                                                 |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lane Util. Factor                 | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |
| Frt                               | 1.00                                                                              | 0.92                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.85                                                                              | 1.00                                                                              | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 1.00                                                                                | 0.85                                                                                |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              | 1.00                                                                              | 0.95                                                                              | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (prot)                 | 1752                                                                              | 1704                                                                              |                                                                                   | 1752                                                                              | 1845                                                                              | 1568                                                                              | 1752                                                                              | 3505                                                                                | 1568                                                                                | 1752                                                                                | 3505                                                                                | 1568                                                                                |
| Flt Permitted                     | 0.54                                                                              | 1.00                                                                              |                                                                                   | 0.63                                                                              | 1.00                                                                              | 1.00                                                                              | 0.26                                                                              | 1.00                                                                                | 1.00                                                                                | 0.08                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (perm)                 | 1002                                                                              | 1704                                                                              |                                                                                   | 1167                                                                              | 1845                                                                              | 1568                                                                              | 477                                                                               | 3505                                                                                | 1568                                                                                | 142                                                                                 | 3505                                                                                | 1568                                                                                |
| Peak-hour factor, PHF             | 0.83                                                                              | 0.83                                                                              | 0.83                                                                              | 0.75                                                                              | 0.75                                                                              | 0.75                                                                              | 0.92                                                                              | 0.92                                                                                | 0.92                                                                                | 0.85                                                                                | 0.85                                                                                | 0.85                                                                                |
| Adj. Flow (vph)                   | 222                                                                               | 98                                                                                | 101                                                                               | 64                                                                                | 65                                                                                | 73                                                                                | 82                                                                                | 1477                                                                                | 102                                                                                 | 189                                                                                 | 952                                                                                 | 125                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 32                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 65                                                                                | 0                                                                                 | 0                                                                                   | 21                                                                                  | 0                                                                                   | 0                                                                                   | 49                                                                                  |
| Lane Group Flow (vph)             | 222                                                                               | 167                                                                               | 0                                                                                 | 64                                                                                | 65                                                                                | 8                                                                                 | 82                                                                                | 1477                                                                                | 81                                                                                  | 189                                                                                 | 952                                                                                 | 76                                                                                  |
| Turn Type                         | pm+pt                                                                             |                                                                                   |                                                                                   | Perm                                                                              |                                                                                   | Perm                                                                              | pm+pt                                                                             |                                                                                     | Perm                                                                                | pm+pt                                                                               |                                                                                     | Perm                                                                                |
| Protected Phases                  | 7                                                                                 | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 5                                                                                 | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases                  | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 8                                                                                 | 2                                                                                 |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     | 6                                                                                   |
| Actuated Green, G (s)             | 27.6                                                                              | 27.6                                                                              |                                                                                   | 11.6                                                                              | 11.6                                                                              | 11.6                                                                              | 71.8                                                                              | 65.5                                                                                | 65.5                                                                                | 82.4                                                                                | 71.1                                                                                | 71.1                                                                                |
| Effective Green, g (s)            | 29.6                                                                              | 29.6                                                                              |                                                                                   | 13.6                                                                              | 13.6                                                                              | 13.6                                                                              | 75.8                                                                              | 67.5                                                                                | 67.5                                                                                | 84.4                                                                                | 73.1                                                                                | 73.1                                                                                |
| Actuated g/C Ratio                | 0.25                                                                              | 0.25                                                                              |                                                                                   | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.63                                                                              | 0.56                                                                                | 0.56                                                                                | 0.70                                                                                | 0.61                                                                                | 0.61                                                                                |
| Clearance Time (s)                | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lane Grp Cap (vph)                | 328                                                                               | 420                                                                               |                                                                                   | 132                                                                               | 209                                                                               | 178                                                                               | 389                                                                               | 1972                                                                                | 882                                                                                 | 286                                                                                 | 2135                                                                                | 955                                                                                 |
| v/s Ratio Prot                    | c0.07                                                                             | 0.10                                                                              |                                                                                   |                                                                                   | 0.04                                                                              |                                                                                   | 0.01                                                                              | c0.42                                                                               |                                                                                     | c0.08                                                                               | 0.27                                                                                |                                                                                     |
| v/s Ratio Perm                    | c0.09                                                                             |                                                                                   |                                                                                   | 0.05                                                                              |                                                                                   | 0.01                                                                              | 0.12                                                                              |                                                                                     | 0.05                                                                                | 0.39                                                                                |                                                                                     | 0.05                                                                                |
| v/c Ratio                         | 0.68                                                                              | 0.40                                                                              |                                                                                   | 0.48                                                                              | 0.31                                                                              | 0.05                                                                              | 0.21                                                                              | 0.75                                                                                | 0.09                                                                                | 0.66                                                                                | 0.45                                                                                | 0.08                                                                                |
| Uniform Delay, d1                 | 39.1                                                                              | 37.7                                                                              |                                                                                   | 49.9                                                                              | 48.9                                                                              | 47.4                                                                              | 9.0                                                                               | 19.8                                                                                | 12.1                                                                                | 25.9                                                                                | 12.6                                                                                | 9.6                                                                                 |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.98                                                                              | 0.97                                                                                | 0.97                                                                                | 1.01                                                                                | 0.91                                                                                | 1.56                                                                                |
| Incremental Delay, d2             | 5.5                                                                               | 0.6                                                                               |                                                                                   | 2.8                                                                               | 0.9                                                                               | 0.1                                                                               | 0.3                                                                               | 2.7                                                                                 | 0.2                                                                                 | 3.1                                                                                 | 0.4                                                                                 | 0.1                                                                                 |
| Delay (s)                         | 44.6                                                                              | 38.4                                                                              |                                                                                   | 52.7                                                                              | 49.7                                                                              | 47.5                                                                              | 9.1                                                                               | 21.9                                                                                | 12.0                                                                                | 29.3                                                                                | 11.8                                                                                | 15.1                                                                                |
| Level of Service                  | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | D                                                                                 | A                                                                                 | C                                                                                   | B                                                                                   | C                                                                                   | B                                                                                   | B                                                                                   |
| Approach Delay (s)                |                                                                                   | 41.6                                                                              |                                                                                   |                                                                                   | 49.9                                                                              |                                                                                   |                                                                                   | 20.7                                                                                |                                                                                     |                                                                                     | 14.7                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM Average Control Delay         |                                                                                   |                                                                                   | 22.7                                                                              |                                                                                   |                                                                                   |                                                                                   | HCM Level of Service                                                              |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |
| HCM Volume to Capacity ratio      |                                                                                   |                                                                                   | 0.72                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 120.0                                                                             |                                                                                   |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                     |                                                                                     | 9.0                                                                                 |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 74.2%                                                                             |                                                                                   |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

2012 AM Peak NO BUILD Conditions

Existing Geometry  
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Timings  
2: Bluewater Rd & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                      |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group           | EBL                                                                               | EBT                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations  |  |  |  |  |  |  |  |  |  |  |  |
| Volume (vph)         | 184                                                                               | 81                                                                                | 48                                                                                | 49                                                                                | 70                                                                                | 75                                                                                | 1408                                                                               | 94                                                                                  | 176                                                                                 | 858                                                                                 | 106                                                                                 |
| Turn Type            | pm+pt                                                                             |                                                                                   | Perm                                                                              |                                                                                   | Perm                                                                              | pm+pt                                                                             |                                                                                    | Perm                                                                                | pm+pt                                                                               |                                                                                     | Perm                                                                                |
| Protected Phases     | 7                                                                                 | 4                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 5                                                                                 | 2                                                                                  |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases     | 4                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 8                                                                                 | 2                                                                                 |                                                                                    | 2                                                                                   | 6                                                                                   |                                                                                     | 6                                                                                   |
| Detector Phase       | 7                                                                                 | 4                                                                                 | 8                                                                                 | 8                                                                                 | 8                                                                                 | 5                                                                                 | 2                                                                                  | 2                                                                                   | 1                                                                                   | 6                                                                                   | 6                                                                                   |
| Switch Phase         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Minimum Initial (s)  | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 |
| Minimum Split (s)    | 10.0                                                                              | 21.0                                                                              | 21.0                                                                              | 21.0                                                                              | 21.0                                                                              | 10.0                                                                              | 21.0                                                                               | 21.0                                                                                | 10.0                                                                                | 21.0                                                                                | 21.0                                                                                |
| Total Split (s)      | 16.0                                                                              | 37.0                                                                              | 21.0                                                                              | 21.0                                                                              | 21.0                                                                              | 10.0                                                                              | 65.0                                                                               | 65.0                                                                                | 18.0                                                                                | 73.0                                                                                | 73.0                                                                                |
| Total Split (%)      | 13.3%                                                                             | 30.8%                                                                             | 17.5%                                                                             | 17.5%                                                                             | 17.5%                                                                             | 8.3%                                                                              | 54.2%                                                                              | 54.2%                                                                               | 15.0%                                                                               | 60.8%                                                                               | 60.8%                                                                               |
| Yellow Time (s)      | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                                | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 |
| All-Red Time (s)     | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                                | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 |
| Lost Time Adjust (s) | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                               | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                |
| Total Lost Time (s)  | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lead/Lag             | Lead                                                                              |                                                                                   | Lag                                                                               | Lag                                                                               | Lag                                                                               | Lead                                                                              | Lag                                                                                | Lag                                                                                 | Lead                                                                                | Lag                                                                                 | Lag                                                                                 |
| Lead-Lag Optimize?   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Recall Mode          | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | C-Max                                                                              | C-Max                                                                               | Min                                                                                 | C-Max                                                                               | C-Max                                                                               |
| Act Effct Green (s)  | 29.6                                                                              | 29.6                                                                              | 13.6                                                                              | 13.6                                                                              | 13.6                                                                              | 74.9                                                                              | 66.6                                                                               | 66.6                                                                                | 84.3                                                                                | 73.1                                                                                | 73.1                                                                                |
| Actuated g/C Ratio   | 0.25                                                                              | 0.25                                                                              | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.62                                                                              | 0.56                                                                               | 0.56                                                                                | 0.70                                                                                | 0.61                                                                                | 0.61                                                                                |
| v/c Ratio            | 0.68                                                                              | 0.44                                                                              | 0.48                                                                              | 0.31                                                                              | 0.36                                                                              | 0.22                                                                              | 0.79                                                                               | 0.11                                                                                | 0.73                                                                                | 0.47                                                                                | 0.12                                                                                |
| Control Delay        | 49.6                                                                              | 32.1                                                                              | 61.1                                                                              | 51.5                                                                              | 13.2                                                                              | 8.1                                                                               | 25.2                                                                               | 8.3                                                                                 | 34.7                                                                                | 12.6                                                                                | 3.1                                                                                 |
| Queue Delay          | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Total Delay          | 49.6                                                                              | 32.1                                                                              | 61.1                                                                              | 51.5                                                                              | 13.2                                                                              | 8.1                                                                               | 25.2                                                                               | 8.3                                                                                 | 34.7                                                                                | 12.6                                                                                | 3.1                                                                                 |
| LOS                  | D                                                                                 | C                                                                                 | E                                                                                 | D                                                                                 | B                                                                                 | A                                                                                 | C                                                                                  | A                                                                                   | C                                                                                   | B                                                                                   | A                                                                                   |
| Approach Delay       |                                                                                   | 41.4                                                                              |                                                                                   | 38.2                                                                              |                                                                                   |                                                                                   | 23.4                                                                               |                                                                                     |                                                                                     | 15.1                                                                                |                                                                                     |
| Approach LOS         |                                                                                   | D                                                                                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | C                                                                                  |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 6 (5%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 23.3

Intersection LOS: C

Intersection Capacity Utilization 76.4%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: Bluewater Rd & Unser Blvd

|                                                                                     |                                                                                     |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |
| ø1                                                                                  | ø2                                                                                  | ø4                                                                                    |
| 18 s                                                                                | 65 s                                                                                | 37 s                                                                                  |
|  |  |  |
| ø5                                                                                  | ø6                                                                                  | ø7                                                                                    |
| 10 s                                                                                | 73 s                                                                                | 16 s                                                                                  |
|                                                                                     |                                                                                     | ø8                                                                                    |
|                                                                                     |                                                                                     | 21 s                                                                                  |

# HCM Signalized Intersection Capacity Analysis 2: Bluewater Rd & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |  |  |  |  |  |  |   |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Volume (vph)                      | 184                                                                               | 81                                                                                | 84                                                                                | 48                                                                                | 49                                                                                | 70                                                                                | 75                                                                                 | 1408                                                                                | 94                                                                                  | 176                                                                                 | 858                                                                                 | 106                                                                                 |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lane Util. Factor                 | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                               | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |
| Flt                               | 1.00                                                                              | 0.92                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.85                                                                              | 1.00                                                                               | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 1.00                                                                                | 0.85                                                                                |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              | 1.00                                                                              | 0.95                                                                               | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (prot)                 | 1752                                                                              | 1704                                                                              |                                                                                   | 1752                                                                              | 1845                                                                              | 1568                                                                              | 1752                                                                               | 3505                                                                                | 1568                                                                                | 1752                                                                                | 3505                                                                                | 1568                                                                                |
| Flt Permitted                     | 0.54                                                                              | 1.00                                                                              |                                                                                   | 0.63                                                                              | 1.00                                                                              | 1.00                                                                              | 0.24                                                                               | 1.00                                                                                | 1.00                                                                                | 0.06                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (perm)                 | 1002                                                                              | 1704                                                                              |                                                                                   | 1167                                                                              | 1845                                                                              | 1568                                                                              | 444                                                                                | 3505                                                                                | 1568                                                                                | 118                                                                                 | 3505                                                                                | 1568                                                                                |
| Peak-hour factor, PHF             | 0.83                                                                              | 0.83                                                                              | 0.83                                                                              | 0.75                                                                              | 0.75                                                                              | 0.75                                                                              | 0.92                                                                               | 0.92                                                                                | 0.92                                                                                | 0.85                                                                                | 0.85                                                                                | 0.85                                                                                |
| Adj. Flow (vph)                   | 222                                                                               | 98                                                                                | 101                                                                               | 64                                                                                | 65                                                                                | 93                                                                                | 82                                                                                 | 1530                                                                                | 102                                                                                 | 207                                                                                 | 1009                                                                                | 125                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 32                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 82                                                                                | 0                                                                                  | 0                                                                                   | 21                                                                                  | 0                                                                                   | 0                                                                                   | 47                                                                                  |
| Lane Group Flow (vph)             | 222                                                                               | 167                                                                               | 0                                                                                 | 64                                                                                | 65                                                                                | 11                                                                                | 82                                                                                 | 1530                                                                                | 81                                                                                  | 207                                                                                 | 1009                                                                                | 78                                                                                  |
| Turn Type                         | pm+pt                                                                             |                                                                                   |                                                                                   | Perm                                                                              |                                                                                   |                                                                                   | Perm                                                                               |                                                                                     |                                                                                     | Perm                                                                                |                                                                                     | Perm                                                                                |
| Protected Phases                  | 7                                                                                 | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 5                                                                                  | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases                  | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 8                                                                                 | 2                                                                                  |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     | 6                                                                                   |
| Actuated Green, G (s)             | 27.6                                                                              | 27.6                                                                              |                                                                                   | 11.6                                                                              | 11.6                                                                              | 11.6                                                                              | 70.9                                                                               | 64.6                                                                                | 64.6                                                                                | 82.4                                                                                | 71.1                                                                                | 71.1                                                                                |
| Effective Green, g (s)            | 29.6                                                                              | 29.6                                                                              |                                                                                   | 13.6                                                                              | 13.6                                                                              | 13.6                                                                              | 74.9                                                                               | 66.6                                                                                | 66.6                                                                                | 84.4                                                                                | 73.1                                                                                | 73.1                                                                                |
| Actuated g/C Ratio                | 0.25                                                                              | 0.25                                                                              |                                                                                   | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.62                                                                               | 0.55                                                                                | 0.55                                                                                | 0.70                                                                                | 0.61                                                                                | 0.61                                                                                |
| Clearance Time (s)                | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lane Grp Cap (vph)                | 328                                                                               | 420                                                                               |                                                                                   | 132                                                                               | 209                                                                               | 178                                                                               | 368                                                                                | 1945                                                                                | 870                                                                                 | 285                                                                                 | 2135                                                                                | 955                                                                                 |
| v/s Ratio Prot                    | c0.07                                                                             | 0.10                                                                              |                                                                                   |                                                                                   | 0.04                                                                              |                                                                                   | 0.02                                                                               | c0.44                                                                               |                                                                                     | c0.09                                                                               | 0.29                                                                                |                                                                                     |
| v/s Ratio Perm                    | c0.09                                                                             |                                                                                   |                                                                                   | 0.05                                                                              |                                                                                   | 0.01                                                                              | 0.12                                                                               |                                                                                     | 0.05                                                                                | 0.42                                                                                |                                                                                     | 0.05                                                                                |
| v/c Ratio                         | 0.68                                                                              | 0.40                                                                              |                                                                                   | 0.48                                                                              | 0.31                                                                              | 0.06                                                                              | 0.22                                                                               | 0.79                                                                                | 0.09                                                                                | 0.73                                                                                | 0.47                                                                                | 0.08                                                                                |
| Uniform Delay, d1                 | 39.1                                                                              | 37.7                                                                              |                                                                                   | 49.9                                                                              | 48.9                                                                              | 47.5                                                                              | 9.4                                                                                | 21.1                                                                                | 12.5                                                                                | 32.5                                                                                | 12.9                                                                                | 9.6                                                                                 |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.98                                                                               | 0.97                                                                                | 0.98                                                                                | 0.99                                                                                | 0.91                                                                                | 1.33                                                                                |
| Incremental Delay, d2             | 5.5                                                                               | 0.6                                                                               |                                                                                   | 2.8                                                                               | 0.9                                                                               | 0.1                                                                               | 0.3                                                                                | 3.3                                                                                 | 0.2                                                                                 | 5.1                                                                                 | 0.4                                                                                 | 0.1                                                                                 |
| Delay (s)                         | 44.6                                                                              | 38.4                                                                              |                                                                                   | 52.7                                                                              | 49.7                                                                              | 47.6                                                                              | 9.5                                                                                | 23.8                                                                                | 12.5                                                                                | 37.2                                                                                | 12.1                                                                                | 12.9                                                                                |
| Level of Service                  | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | D                                                                                 | A                                                                                  | C                                                                                   | B                                                                                   | D                                                                                   | B                                                                                   | B                                                                                   |
| Approach Delay (s)                |                                                                                   | 41.6                                                                              |                                                                                   |                                                                                   | 49.7                                                                              |                                                                                   |                                                                                    | 22.4                                                                                |                                                                                     |                                                                                     | 16.0                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM Average Control Delay         |                                                                                   |                                                                                   | 23.9                                                                              |                                                                                   |                                                                                   |                                                                                   | HCM Level of Service                                                               |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |
| HCM Volume to Capacity ratio      |                                                                                   |                                                                                   | 0.75                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 120.0                                                                             |                                                                                   |                                                                                   |                                                                                   | Sum of lost time (s)                                                               |                                                                                     |                                                                                     | 9.0                                                                                 |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 76.4%                                                                             |                                                                                   |                                                                                   |                                                                                   | ICU Level of Service                                                               |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

Timings  
2: Bluewater Rd & Unser Blvd

Terry O. Brown, P.E.

12/29/2010 - Synchro 7

|                      |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group           | EBL                                                                               | EBT                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations  |  |  |  |  |  |  |  |  |  |  |  |
| Volume (vph)         | 109                                                                               | 58                                                                                | 96                                                                                | 94                                                                                | 194                                                                               | 70                                                                                | 1050                                                                               | 31                                                                                  | 87                                                                                  | 1217                                                                                | 130                                                                                 |
| Turn Type            | pm+pt                                                                             |                                                                                   | Perm                                                                              |                                                                                   | Perm                                                                              | pm+pt                                                                             |                                                                                    | Perm                                                                                | pm+pt                                                                               |                                                                                     | Perm                                                                                |
| Protected Phases     | 7                                                                                 | 4                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 5                                                                                 | 2                                                                                  |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases     | 4                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 8                                                                                 | 2                                                                                 |                                                                                    | 2                                                                                   | 6                                                                                   |                                                                                     | 6                                                                                   |
| Detector Phase       | 7                                                                                 | 4                                                                                 | 8                                                                                 | 8                                                                                 | 8                                                                                 | 5                                                                                 | 2                                                                                  | 2                                                                                   | 1                                                                                   | 6                                                                                   | 6                                                                                   |
| Switch Phase         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Minimum Initial (s)  | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 |
| Minimum Split (s)    | 10.0                                                                              | 21.0                                                                              | 21.0                                                                              | 21.0                                                                              | 21.0                                                                              | 10.0                                                                              | 21.0                                                                               | 21.0                                                                                | 10.0                                                                                | 21.0                                                                                | 21.0                                                                                |
| Total Split (s)      | 10.0                                                                              | 31.0                                                                              | 21.0                                                                              | 21.0                                                                              | 21.0                                                                              | 10.0                                                                              | 60.0                                                                               | 60.0                                                                                | 19.0                                                                                | 69.0                                                                                | 69.0                                                                                |
| Total Split (%)      | 9.1%                                                                              | 28.2%                                                                             | 19.1%                                                                             | 19.1%                                                                             | 19.1%                                                                             | 9.1%                                                                              | 54.5%                                                                              | 54.5%                                                                               | 17.3%                                                                               | 62.7%                                                                               | 62.7%                                                                               |
| Yellow Time (s)      | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                                | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 |
| All-Red Time (s)     | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                                | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 |
| Lost Time Adjust (s) | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                               | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                |
| Total Lost Time (s)  | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lead/Lag             | Lead                                                                              |                                                                                   | Lag                                                                               | Lag                                                                               | Lag                                                                               | Lead                                                                              | Lag                                                                                | Lag                                                                                 | Lead                                                                                | Lag                                                                                 | Lag                                                                                 |
| Lead-Lag Optimize?   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Recall Mode          | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | C-Max                                                                              | C-Max                                                                               | Min                                                                                 | C-Max                                                                               | C-Max                                                                               |
| Act Effect Green (s) | 25.2                                                                              | 25.2                                                                              | 15.2                                                                              | 15.2                                                                              | 15.2                                                                              | 74.2                                                                              | 66.5                                                                               | 66.5                                                                                | 77.3                                                                                | 68.1                                                                                | 68.1                                                                                |
| Actuated g/C Ratio   | 0.23                                                                              | 0.23                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.67                                                                              | 0.60                                                                               | 0.60                                                                                | 0.70                                                                                | 0.62                                                                                | 0.62                                                                                |
| v/c Ratio            | 0.54                                                                              | 0.36                                                                              | 0.60                                                                              | 0.39                                                                              | 0.52                                                                              | 0.27                                                                              | 0.52                                                                               | 0.03                                                                                | 0.26                                                                                | 0.61                                                                                | 0.14                                                                                |
| Control Delay        | 43.3                                                                              | 26.1                                                                              | 59.2                                                                              | 46.9                                                                              | 10.8                                                                              | 7.7                                                                               | 13.8                                                                               | 5.2                                                                                 | 6.9                                                                                 | 14.1                                                                                | 3.6                                                                                 |
| Queue Delay          | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Total Delay          | 43.3                                                                              | 26.1                                                                              | 59.2                                                                              | 46.9                                                                              | 10.8                                                                              | 7.7                                                                               | 13.8                                                                               | 5.2                                                                                 | 6.9                                                                                 | 14.1                                                                                | 3.6                                                                                 |
| LOS                  | D                                                                                 | C                                                                                 | E                                                                                 | D                                                                                 | B                                                                                 | A                                                                                 | B                                                                                  | A                                                                                   | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Delay       |                                                                                   | 34.3                                                                              |                                                                                   | 31.8                                                                              |                                                                                   |                                                                                   | 13.2                                                                               |                                                                                     |                                                                                     | 12.7                                                                                |                                                                                     |
| Approach LOS         |                                                                                   | C                                                                                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | B                                                                                  |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 36 (33%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 16.9

Intersection LOS: B

Intersection Capacity Utilization 63.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Bluewater Rd & Unser Blvd

|                                                                                     |                                                                                     |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |
| ø1                                                                                  | ø2                                                                                  | ø4                                                                                    |
| 19 s                                                                                | 60 s                                                                                | 31 s                                                                                  |
|  |  |  |
| ø5                                                                                  | ø6                                                                                  | ø7                                                                                    |
| 10 s                                                                                | 69 s                                                                                | 21 s                                                                                  |

2012 PM Peak NO BUILD Conditions

Existing Geometry

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# HCM Signalized Intersection Capacity Analysis 2: Bluewater Rd & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |  |  |  |  |  |  |    |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |  |  |                                                                                   |  |  |  |  |  |  |  |  |  |
| Volume (vph)                      | 109                                                                               | 58                                                                                | 63                                                                                | 96                                                                                | 94                                                                                | 194                                                                               | 70                                                                                  | 1050                                                                                | 31                                                                                  | 87                                                                                  | 1217                                                                                | 130                                                                                 |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lane Util. Factor                 | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |
| Frt                               | 1.00                                                                              | 0.92                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 0.85                                                                              | 1.00                                                                                | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 1.00                                                                                | 0.85                                                                                |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              | 1.00                                                                              | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (prot)                 | 1752                                                                              | 1700                                                                              |                                                                                   | 1752                                                                              | 1845                                                                              | 1568                                                                              | 1752                                                                                | 3505                                                                                | 1568                                                                                | 1752                                                                                | 3505                                                                                | 1568                                                                                |
| Flt Permitted                     | 0.48                                                                              | 1.00                                                                              |                                                                                   | 0.66                                                                              | 1.00                                                                              | 1.00                                                                              | 0.14                                                                                | 1.00                                                                                | 1.00                                                                                | 0.18                                                                                | 1.00                                                                                | 1.00                                                                                |
| Satd. Flow (perm)                 | 891                                                                               | 1700                                                                              |                                                                                   | 1215                                                                              | 1845                                                                              | 1568                                                                              | 257                                                                                 | 3505                                                                                | 1568                                                                                | 341                                                                                 | 3505                                                                                | 1568                                                                                |
| Peak-hour factor, PHF             | 0.78                                                                              | 0.78                                                                              | 0.78                                                                              | 0.95                                                                              | 0.95                                                                              | 0.95                                                                              | 0.95                                                                                | 0.95                                                                                | 0.95                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)                   | 140                                                                               | 74                                                                                | 81                                                                                | 101                                                                               | 99                                                                                | 204                                                                               | 74                                                                                  | 1105                                                                                | 33                                                                                  | 95                                                                                  | 1323                                                                                | 141                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                 | 37                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 176                                                                               | 0                                                                                   | 0                                                                                   | 9                                                                                   | 0                                                                                   | 0                                                                                   | 44                                                                                  |
| Lane Group Flow (vph)             | 140                                                                               | 118                                                                               | 0                                                                                 | 101                                                                               | 99                                                                                | 28                                                                                | 74                                                                                  | 1105                                                                                | 24                                                                                  | 95                                                                                  | 1323                                                                                | 97                                                                                  |
| Turn Type                         | pm+pt                                                                             |                                                                                   |                                                                                   | Perm                                                                              |                                                                                   | Perm                                                                              | pm+pt                                                                               |                                                                                     | Perm                                                                                | pm+pt                                                                               |                                                                                     | Perm                                                                                |
| Protected Phases                  | 7                                                                                 | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 5                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases                  | 4                                                                                 |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 8                                                                                 | 2                                                                                   |                                                                                     | 2                                                                                   | 6                                                                                   |                                                                                     | 6                                                                                   |
| Actuated Green, G (s)             | 23.2                                                                              | 23.2                                                                              |                                                                                   | 13.2                                                                              | 13.2                                                                              | 13.2                                                                              | 70.2                                                                                | 64.5                                                                                | 64.5                                                                                | 73.4                                                                                | 66.1                                                                                | 66.1                                                                                |
| Effective Green, g (s)            | 25.2                                                                              | 25.2                                                                              |                                                                                   | 15.2                                                                              | 15.2                                                                              | 15.2                                                                              | 74.2                                                                                | 66.5                                                                                | 66.5                                                                                | 77.4                                                                                | 68.1                                                                                | 68.1                                                                                |
| Actuated g/C Ratio                | 0.23                                                                              | 0.23                                                                              |                                                                                   | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.67                                                                                | 0.60                                                                                | 0.60                                                                                | 0.70                                                                                | 0.62                                                                                | 0.62                                                                                |
| Clearance Time (s)                | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lane Grp Cap (vph)                | 259                                                                               | 389                                                                               |                                                                                   | 168                                                                               | 255                                                                               | 217                                                                               | 278                                                                                 | 2119                                                                                | 948                                                                                 | 359                                                                                 | 2170                                                                                | 971                                                                                 |
| v/s Ratio Prot                    | c0.03                                                                             | 0.07                                                                              |                                                                                   |                                                                                   | 0.05                                                                              |                                                                                   | 0.02                                                                                | 0.32                                                                                |                                                                                     | c0.02                                                                               | c0.38                                                                               |                                                                                     |
| v/s Ratio Perm                    | c0.09                                                                             |                                                                                   |                                                                                   | 0.08                                                                              |                                                                                   | 0.02                                                                              | 0.16                                                                                |                                                                                     | 0.02                                                                                | 0.16                                                                                |                                                                                     | 0.06                                                                                |
| v/c Ratio                         | 0.54                                                                              | 0.30                                                                              |                                                                                   | 0.60                                                                              | 0.39                                                                              | 0.13                                                                              | 0.27                                                                                | 0.52                                                                                | 0.03                                                                                | 0.26                                                                                | 0.61                                                                                | 0.10                                                                                |
| Uniform Delay, d1                 | 35.9                                                                              | 35.1                                                                              |                                                                                   | 44.6                                                                              | 43.2                                                                              | 41.6                                                                              | 8.8                                                                                 | 12.6                                                                                | 8.7                                                                                 | 7.2                                                                                 | 12.8                                                                                | 8.5                                                                                 |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.97                                                                                | 0.97                                                                                | 0.95                                                                                | 1.02                                                                                | 0.97                                                                                | 1.27                                                                                |
| Incremental Delay, d2             | 2.3                                                                               | 0.4                                                                               |                                                                                   | 5.9                                                                               | 1.0                                                                               | 0.3                                                                               | 0.5                                                                                 | 0.9                                                                                 | 0.0                                                                                 | 0.3                                                                                 | 1.1                                                                                 | 0.2                                                                                 |
| Delay (s)                         | 38.2                                                                              | 35.6                                                                              |                                                                                   | 50.5                                                                              | 44.1                                                                              | 41.9                                                                              | 9.0                                                                                 | 13.0                                                                                | 8.4                                                                                 | 7.7                                                                                 | 13.5                                                                                | 11.0                                                                                |
| Level of Service                  | D                                                                                 | D                                                                                 |                                                                                   | D                                                                                 | D                                                                                 | D                                                                                 | A                                                                                   | B                                                                                   | A                                                                                   | A                                                                                   | B                                                                                   | B                                                                                   |
| Approach Delay (s)                |                                                                                   | 36.8                                                                              |                                                                                   |                                                                                   | 44.6                                                                              |                                                                                   |                                                                                     | 12.7                                                                                |                                                                                     |                                                                                     | 12.9                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM Average Control Delay         |                                                                                   | 18.5                                                                              |                                                                                   | HCM Level of Service                                                              |                                                                                   |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM Volume to Capacity ratio      |                                                                                   | 0.57                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   | 110.0                                                                             |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                   |                                                                                     | 9.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 63.4%                                                                             |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                   |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

Timings  
2: Bluewater Rd & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                      |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Group           | EBL                                                                               | EBT                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations  |  |  |  |  |  |  |  |  |  |  |  |
| Volume (vph)         | 109                                                                               | 58                                                                                | 96                                                                                | 94                                                                                | 210                                                                               | 70                                                                                | 1101                                                                              | 31                                                                                  | 103                                                                                 | 1268                                                                                | 130                                                                                 |
| Turn Type            | pm+pt                                                                             |                                                                                   | Perm                                                                              |                                                                                   | Perm                                                                              | pm+pt                                                                             |                                                                                   | Perm                                                                                | pm+pt                                                                               |                                                                                     | Perm                                                                                |
| Protected Phases     | 7                                                                                 | 4                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 5                                                                                 | 2                                                                                 |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     |
| Permitted Phases     | 4                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 8                                                                                 | 2                                                                                 |                                                                                   | 2                                                                                   | 6                                                                                   |                                                                                     | 6                                                                                   |
| Detector Phase       | 7                                                                                 | 4                                                                                 | 8                                                                                 | 8                                                                                 | 8                                                                                 | 5                                                                                 | 2                                                                                 | 2                                                                                   | 1                                                                                   | 6                                                                                   | 6                                                                                   |
| Switch Phase         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Minimum Initial (s)  | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 | 5.0                                                                                 |
| Minimum Split (s)    | 10.0                                                                              | 21.0                                                                              | 21.0                                                                              | 21.0                                                                              | 21.0                                                                              | 10.0                                                                              | 21.0                                                                              | 21.0                                                                                | 10.0                                                                                | 21.0                                                                                | 21.0                                                                                |
| Total Split (s)      | 12.0                                                                              | 36.0                                                                              | 24.0                                                                              | 24.0                                                                              | 24.0                                                                              | 10.0                                                                              | 72.0                                                                              | 72.0                                                                                | 12.0                                                                                | 74.0                                                                                | 74.0                                                                                |
| Total Split (%)      | 10.0%                                                                             | 30.0%                                                                             | 20.0%                                                                             | 20.0%                                                                             | 20.0%                                                                             | 8.3%                                                                              | 60.0%                                                                             | 60.0%                                                                               | 10.0%                                                                               | 61.7%                                                                               | 61.7%                                                                               |
| Yellow Time (s)      | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 | 4.0                                                                                 |
| All-Red Time (s)     | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 | 1.0                                                                                 |
| Lost Time Adjust (s) | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                | -2.0                                                                                |
| Total Lost Time (s)  | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lead/Lag             | Lead                                                                              |                                                                                   | Lag                                                                               | Lag                                                                               | Lag                                                                               | Lead                                                                              | Lag                                                                               | Lag                                                                                 | Lead                                                                                | Lag                                                                                 | Lag                                                                                 |
| Lead-Lag Optimize?   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Recall Mode          | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | Min                                                                               | C-Max                                                                             | C-Max                                                                               | Min                                                                                 | C-Max                                                                               | C-Max                                                                               |
| Act Effct Green (s)  | 28.6                                                                              | 28.6                                                                              | 16.6                                                                              | 16.6                                                                              | 16.6                                                                              | 81.2                                                                              | 73.2                                                                              | 73.2                                                                                | 83.6                                                                                | 74.4                                                                                | 74.4                                                                                |
| Actuated g/C Ratio   | 0.24                                                                              | 0.24                                                                              | 0.14                                                                              | 0.14                                                                              | 0.14                                                                              | 0.68                                                                              | 0.61                                                                              | 0.61                                                                                | 0.70                                                                                | 0.62                                                                                | 0.62                                                                                |
| v/c Ratio            | 0.51                                                                              | 0.35                                                                              | 0.60                                                                              | 0.39                                                                              | 0.61                                                                              | 0.29                                                                              | 0.54                                                                              | 0.03                                                                                | 0.34                                                                                | 0.63                                                                                | 0.14                                                                                |
| Control Delay        | 43.8                                                                              | 28.0                                                                              | 62.8                                                                              | 50.4                                                                              | 20.8                                                                              | 8.7                                                                               | 15.0                                                                              | 5.4                                                                                 | 8.8                                                                                 | 14.6                                                                                | 5.0                                                                                 |
| Queue Delay          | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Total Delay          | 43.8                                                                              | 28.0                                                                              | 62.8                                                                              | 50.4                                                                              | 20.8                                                                              | 8.7                                                                               | 15.0                                                                              | 5.4                                                                                 | 8.8                                                                                 | 14.6                                                                                | 5.0                                                                                 |
| LOS                  | D                                                                                 | C                                                                                 | E                                                                                 | D                                                                                 | C                                                                                 | A                                                                                 | B                                                                                 | A                                                                                   | A                                                                                   | B                                                                                   | A                                                                                   |
| Approach Delay       |                                                                                   | 35.5                                                                              |                                                                                   | 37.8                                                                              |                                                                                   |                                                                                   | 14.4                                                                              |                                                                                     |                                                                                     | 13.4                                                                                |                                                                                     |
| Approach LOS         |                                                                                   | D                                                                                 |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 9 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.63  
 Intersection Signal Delay: 18.4  
 Intersection Capacity Utilization 64.8%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service C

Splits and Phases: 2: Bluewater Rd & Unser Blvd

|                                                                                     |                                                                                     |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |
| ø1                                                                                  | ø2                                                                                  | ø4                                                                                    |
| 12 s                                                                                | 72 s                                                                                | 36 s                                                                                  |
|  |  |  |
| ø5                                                                                  | ø6                                                                                  | ø7 ø8                                                                                 |
| 10 s                                                                                | 74 s                                                                                | 12 s 24 s                                                                             |

Terry O. Brown, P.E.  
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Existing Geometry  
D:\ATOB\PROJECTS\Valero\_Los\_Volcanes\_Unser\SynchroTIS\2012PBX.syn

Timings  
4: I-40 N. ramp & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                      |  |  |  |  |  |
|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Lane Group           | WBL                                                                               | WBT                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               |
| Lane Configurations  |  |  |  |  |  |
| Volume (vph)         | 391                                                                               | 1                                                                                 | 36                                                                                | 659                                                                               | 2341                                                                              |
| Turn Type            | Perm                                                                              |                                                                                   | pm+pt                                                                             |                                                                                   |                                                                                   |
| Protected Phases     |                                                                                   | 8                                                                                 | 5                                                                                 | 2                                                                                 | 6                                                                                 |
| Permitted Phases     | 8                                                                                 |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   |
| Detector Phase       | 8                                                                                 | 8                                                                                 | 5                                                                                 | 2                                                                                 | 6                                                                                 |
| Switch Phase         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Minimum Initial (s)  | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               |
| Minimum Split (s)    | 21.0                                                                              | 21.0                                                                              | 10.0                                                                              | 21.0                                                                              | 21.0                                                                              |
| Total Split (s)      | 31.0                                                                              | 31.0                                                                              | 10.0                                                                              | 89.0                                                                              | 79.0                                                                              |
| Total Split (%)      | 25.8%                                                                             | 25.8%                                                                             | 8.3%                                                                              | 74.2%                                                                             | 65.8%                                                                             |
| Yellow Time (s)      | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               |
| All-Red Time (s)     | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               |
| Lost Time Adjust (s) | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              |
| Total Lost Time (s)  | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               |
| Lead/Lag             |                                                                                   |                                                                                   | Lead                                                                              |                                                                                   | Lag                                                                               |
| Lead-Lag Optimize?   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Recall Mode          | Min                                                                               | Min                                                                               | Min                                                                               | C-Max                                                                             | C-Max                                                                             |
| Act Effct Green (s)  | 23.0                                                                              | 23.0                                                                              | 91.0                                                                              | 91.0                                                                              | 80.3                                                                              |
| Actuated g/C Ratio   | 0.19                                                                              | 0.19                                                                              | 0.76                                                                              | 0.76                                                                              | 0.67                                                                              |
| v/c Ratio            | 0.71                                                                              | 0.72                                                                              | 0.24                                                                              | 0.29                                                                              | 0.73                                                                              |
| Control Delay        | 57.7                                                                              | 57.9                                                                              | 8.0                                                                               | 3.1                                                                               | 8.4                                                                               |
| Queue Delay          | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |
| Total Delay          | 57.7                                                                              | 57.9                                                                              | 8.0                                                                               | 3.1                                                                               | 8.4                                                                               |
| LOS                  | E                                                                                 | E                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 |
| Approach Delay       |                                                                                   | 57.8                                                                              |                                                                                   | 3.3                                                                               | 8.4                                                                               |
| Approach LOS         |                                                                                   | E                                                                                 |                                                                                   | A                                                                                 | A                                                                                 |

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 64 (53%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 13.3  
 Intersection Capacity Utilization 74.4%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service D

Splits and Phases: 4: I-40 N. ramp & Unser Blvd

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |
| 89 s                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|  |  |  |  |  |  |
| 10 s                                                                                | 79 s                                                                                |                                                                                     |                                                                                     |                                                                                     | 31 s                                                                                |

# HCM Signalized Intersection Capacity Analysis 4: I-40 N. ramp & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |  |  |  |  |  |  |   |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |                                                                                   |                                                                                   |  |  |  |  |  |                                                                                     |                                                                                     |  |  |
| Volume (vph)                      | 0                                                                                 | 0                                                                                 | 0                                                                                 | 391                                                                               | 1                                                                                 | 0                                                                                 | 36                                                                                 | 659                                                                                 | 0                                                                                   | 0                                                                                   | 2341                                                                                | 0                                                                                   |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   |                                                                                   |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                                | 3.0                                                                                 |                                                                                     |                                                                                     | 3.0                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   |                                                                                   |                                                                                   | 0.95                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                               | 0.95                                                                                |                                                                                     |                                                                                     | 0.91                                                                                |                                                                                     |
| Frt                               |                                                                                   |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   |                                                                                   |                                                                                   | 0.95                                                                              | 0.95                                                                              |                                                                                   | 0.95                                                                               | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   |                                                                                   |                                                                                   | 1665                                                                              | 1669                                                                              |                                                                                   | 1752                                                                               | 3505                                                                                |                                                                                     |                                                                                     | 5036                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   |                                                                                   |                                                                                   | 0.95                                                                              | 0.95                                                                              |                                                                                   | 0.05                                                                               | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   |                                                                                   |                                                                                   | 1665                                                                              | 1669                                                                              |                                                                                   | 89                                                                                 | 3505                                                                                |                                                                                     |                                                                                     | 5036                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              | 0.85                                                                               | 0.85                                                                                | 0.85                                                                                | 0.95                                                                                | 0.95                                                                                | 0.95                                                                                |
| Adj. Flow (vph)                   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 455                                                                               | 1                                                                                 | 0                                                                                 | 42                                                                                 | 775                                                                                 | 0                                                                                   | 0                                                                                   | 2464                                                                                | 0                                                                                   |
| RTOR Reduction (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 0                                                                                 | 0                                                                                 | 227                                                                               | 229                                                                               | 0                                                                                 | 42                                                                                 | 775                                                                                 | 0                                                                                   | 0                                                                                   | 2464                                                                                | 0                                                                                   |
| Turn Type                         |                                                                                   |                                                                                   |                                                                                   | Perm                                                                              |                                                                                   | Free                                                                              | pm+pt                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Protected Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 5                                                                                  | 2                                                                                   |                                                                                     |                                                                                     | 6                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | Free                                                                              | 2                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   |                                                                                   |                                                                                   | 21.0                                                                              | 21.0                                                                              |                                                                                   | 89.0                                                                               | 89.0                                                                                |                                                                                     |                                                                                     | 78.2                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   |                                                                                   |                                                                                   | 23.0                                                                              | 23.0                                                                              |                                                                                   | 91.0                                                                               | 91.0                                                                                |                                                                                     |                                                                                     | 80.2                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   |                                                                                   |                                                                                   | 0.19                                                                              | 0.19                                                                              |                                                                                   | 0.76                                                                               | 0.76                                                                                |                                                                                     |                                                                                     | 0.67                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   |                                                                                   |                                                                                   | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                                | 5.0                                                                                 |                                                                                     |                                                                                     | 5.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   |                                                                                   |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                                | 3.0                                                                                 |                                                                                     |                                                                                     | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   |                                                                                   |                                                                                   | 319                                                                               | 320                                                                               |                                                                                   | 176                                                                                | 2658                                                                                |                                                                                     |                                                                                     | 3366                                                                                |                                                                                     |
| v/s Ratio Prot                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.02                                                                               | c0.22                                                                               |                                                                                     |                                                                                     | c0.49                                                                               |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   | 0.14                                                                              | 0.14                                                                              |                                                                                   | 0.17                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   |                                                                                   |                                                                                   | 0.71                                                                              | 0.72                                                                              |                                                                                   | 0.24                                                                               | 0.29                                                                                |                                                                                     |                                                                                     | 0.73                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   |                                                                                   |                                                                                   | 45.4                                                                              | 45.4                                                                              |                                                                                   | 12.4                                                                               | 4.5                                                                                 |                                                                                     |                                                                                     | 12.9                                                                                |                                                                                     |
| Progression Factor                |                                                                                   |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.36                                                                               | 0.59                                                                                |                                                                                     |                                                                                     | 0.60                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   |                                                                                   |                                                                                   | 7.3                                                                               | 7.4                                                                               |                                                                                   | 0.4                                                                                | 0.2                                                                                 |                                                                                     |                                                                                     | 0.1                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   |                                                                                   |                                                                                   | 52.7                                                                              | 52.8                                                                              |                                                                                   | 17.3                                                                               | 2.8                                                                                 |                                                                                     |                                                                                     | 7.9                                                                                 |                                                                                     |
| Level of Service                  |                                                                                   |                                                                                   |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | B                                                                                  | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   | 52.8                                                                              |                                                                                   |                                                                                    | 3.6                                                                                 |                                                                                     |                                                                                     | 7.9                                                                                 |                                                                                     |
| Approach LOS                      |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM Average Control Delay         |                                                                                   |                                                                                   | 12.4                                                                              |                                                                                   |                                                                                   | HCM Level of Service                                                              |                                                                                    |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| HCM Volume to Capacity ratio      |                                                                                   |                                                                                   | 0.70                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 120.0                                                                             |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                    |                                                                                     |                                                                                     | 9.0                                                                                 |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 74.4%                                                                             |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                    |                                                                                     |                                                                                     | D                                                                                   |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

Timings  
4: I-40 N. ramp & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                      |  |  |  |  |  |
|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Lane Group           | WBL                                                                               | WBT                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               |
| Lane Configurations  |  |  |  |  |  |
| Volume (vph)         | 391                                                                               | 1                                                                                 | 36                                                                                | 659                                                                               | 2341                                                                              |
| Turn Type            | Perm                                                                              |                                                                                   | pm+pt                                                                             |                                                                                   |                                                                                   |
| Protected Phases     |                                                                                   | 8                                                                                 | 5                                                                                 | 2                                                                                 | 6                                                                                 |
| Permitted Phases     | 8                                                                                 |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   |
| Detector Phase       | 8                                                                                 | 8                                                                                 | 5                                                                                 | 2                                                                                 | 6                                                                                 |
| Switch Phase         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Minimum Initial (s)  | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               |
| Minimum Split (s)    | 21.0                                                                              | 21.0                                                                              | 10.0                                                                              | 21.0                                                                              | 21.0                                                                              |
| Total Split (s)      | 31.0                                                                              | 31.0                                                                              | 10.0                                                                              | 89.0                                                                              | 79.0                                                                              |
| Total Split (%)      | 25.8%                                                                             | 25.8%                                                                             | 8.3%                                                                              | 74.2%                                                                             | 65.8%                                                                             |
| Yellow Time (s)      | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               |
| All-Red Time (s)     | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               |
| Lost Time Adjust (s) | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              |
| Total Lost Time (s)  | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               |
| Lead/Lag             |                                                                                   |                                                                                   | Lead                                                                              |                                                                                   | Lag                                                                               |
| Lead-Lag Optimize?   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Recall Mode          | Min                                                                               | Min                                                                               | Min                                                                               | C-Max                                                                             | C-Max                                                                             |
| Act Effct Green (s)  | 23.0                                                                              | 23.0                                                                              | 91.0                                                                              | 91.0                                                                              | 80.3                                                                              |
| Actuated g/C Ratio   | 0.19                                                                              | 0.19                                                                              | 0.76                                                                              | 0.76                                                                              | 0.67                                                                              |
| v/c Ratio            | 0.71                                                                              | 0.72                                                                              | 0.24                                                                              | 0.29                                                                              | 0.73                                                                              |
| Control Delay        | 57.7                                                                              | 57.9                                                                              | 8.0                                                                               | 3.0                                                                               | 8.4                                                                               |
| Queue Delay          | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |
| Total Delay          | 57.7                                                                              | 57.9                                                                              | 8.0                                                                               | 3.0                                                                               | 8.4                                                                               |
| LOS                  | E                                                                                 | E                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 |
| Approach Delay       |                                                                                   | 57.8                                                                              |                                                                                   | 3.3                                                                               | 8.4                                                                               |
| Approach LOS         |                                                                                   | E                                                                                 |                                                                                   | A                                                                                 | A                                                                                 |

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 64 (53%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 13.3  
 Intersection Capacity Utilization 74.4%  
 Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service D

Splits and Phases: 4: I-40 N. ramp & Unser Blvd

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |
| 89 s                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|  |  |  |  |  |  |  |
| 10 s                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM Signalized Intersection Capacity Analysis 4: I-40 N. ramp & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

| Movement                          | EBL  | EBT  | EBR   | WBL  | WBT  | WBR                  | NBL   | NBT   | NBR  | SBL  | SBT   | SBR  |
|-----------------------------------|------|------|-------|------|------|----------------------|-------|-------|------|------|-------|------|
| Lane Configurations               |      |      |       | ↰    | ↰    | ↰                    | ↰     | ↰     |      |      | ↰     |      |
| Volume (vph)                      | 0    | 0    | 0     | 391  | 1    | 0                    | 36    | 659   | 0    | 0    | 2341  | 0    |
| Ideal Flow (vphpl)                | 1900 | 1900 | 1900  | 1900 | 1900 | 1900                 | 1900  | 1900  | 1900 | 1900 | 1900  | 1900 |
| Total Lost time (s)               |      |      |       | 3.0  | 3.0  |                      | 3.0   | 3.0   |      |      | 3.0   |      |
| Lane Util. Factor                 |      |      |       | 0.95 | 0.95 |                      | 1.00  | 0.95  |      |      | 0.91  |      |
| Frt                               |      |      |       | 1.00 | 1.00 |                      | 1.00  | 1.00  |      |      | 1.00  |      |
| Flt Protected                     |      |      |       | 0.95 | 0.95 |                      | 0.95  | 1.00  |      |      | 1.00  |      |
| Satd. Flow (prot)                 |      |      |       | 1665 | 1669 |                      | 1752  | 3505  |      |      | 5036  |      |
| Flt Permitted                     |      |      |       | 0.95 | 0.95 |                      | 0.05  | 1.00  |      |      | 1.00  |      |
| Satd. Flow (perm)                 |      |      |       | 1665 | 1669 |                      | 89    | 3505  |      |      | 5036  |      |
| Peak-hour factor, PHF             | 0.85 | 0.85 | 0.85  | 0.86 | 0.86 | 0.86                 | 0.85  | 0.85  | 0.85 | 0.95 | 0.95  | 0.95 |
| Adj. Flow (vph)                   | 0    | 0    | 0     | 455  | 1    | 0                    | 42    | 775   | 0    | 0    | 2464  | 0    |
| RTOR Reduction (vph)              | 0    | 0    | 0     | 0    | 0    | 0                    | 0     | 0     | 0    | 0    | 0     | 0    |
| Lane Group Flow (vph)             | 0    | 0    | 0     | 227  | 229  | 0                    | 42    | 775   | 0    | 0    | 2464  | 0    |
| Turn Type                         |      |      |       | Perm |      | Free                 | pm+pt |       |      |      |       |      |
| Protected Phases                  |      |      |       |      | 8    |                      | 5     | 2     |      |      | 6     |      |
| Permitted Phases                  |      |      |       | 8    |      | Free                 | 2     |       |      |      |       |      |
| Actuated Green, G (s)             |      |      |       | 21.0 | 21.0 |                      | 89.0  | 89.0  |      |      | 78.2  |      |
| Effective Green, g (s)            |      |      |       | 23.0 | 23.0 |                      | 91.0  | 91.0  |      |      | 80.2  |      |
| Actuated g/C Ratio                |      |      |       | 0.19 | 0.19 |                      | 0.76  | 0.76  |      |      | 0.67  |      |
| Clearance Time (s)                |      |      |       | 5.0  | 5.0  |                      | 5.0   | 5.0   |      |      | 5.0   |      |
| Vehicle Extension (s)             |      |      |       | 3.0  | 3.0  |                      | 3.0   | 3.0   |      |      | 3.0   |      |
| Lane Grp Cap (vph)                |      |      |       | 319  | 320  |                      | 176   | 2658  |      |      | 3366  |      |
| v/s Ratio Prot                    |      |      |       |      |      |                      | 0.02  | c0.22 |      |      | c0.49 |      |
| v/s Ratio Perm                    |      |      |       | 0.14 | 0.14 |                      | 0.17  |       |      |      |       |      |
| v/c Ratio                         |      |      |       | 0.71 | 0.72 |                      | 0.24  | 0.29  |      |      | 0.73  |      |
| Uniform Delay, d1                 |      |      |       | 45.4 | 45.4 |                      | 12.4  | 4.5   |      |      | 12.9  |      |
| Progression Factor                |      |      |       | 1.00 | 1.00 |                      | 1.36  | 0.59  |      |      | 0.60  |      |
| Incremental Delay, d2             |      |      |       | 7.3  | 7.4  |                      | 0.4   | 0.2   |      |      | 0.1   |      |
| Delay (s)                         |      |      |       | 52.7 | 52.8 |                      | 17.4  | 2.8   |      |      | 7.9   |      |
| Level of Service                  |      |      |       | D    | D    |                      | B     | A     |      |      | A     |      |
| Approach Delay (s)                |      | 0.0  |       |      | 52.8 |                      |       | 3.6   |      |      | 7.9   |      |
| Approach LOS                      |      | A    |       |      | D    |                      |       | A     |      |      | A     |      |
| <b>Intersection Summary</b>       |      |      |       |      |      |                      |       |       |      |      |       |      |
| HCM Average Control Delay         |      |      | 12.4  |      |      | HCM Level of Service |       |       |      | B    |       |      |
| HCM Volume to Capacity ratio      |      |      | 0.70  |      |      |                      |       |       |      |      |       |      |
| Actuated Cycle Length (s)         |      |      | 120.0 |      |      | Sum of lost time (s) |       |       | 9.0  |      |       |      |
| Intersection Capacity Utilization |      |      | 74.4% |      |      | ICU Level of Service |       |       | D    |      |       |      |
| Analysis Period (min)             |      |      | 15    |      |      |                      |       |       |      |      |       |      |
| c Critical Lane Group             |      |      |       |      |      |                      |       |       |      |      |       |      |

Timings  
4: I-40 N. ramp & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                      |  |  |  |  |  |
|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Lane Group           | WBL                                                                               | WBT                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               |
| Lane Configurations  |  |  |  |  |  |
| Volume (vph)         | 958                                                                               | 3                                                                                 | 26                                                                                | 1034                                                                              | 1049                                                                              |
| Turn Type            | Perm                                                                              |                                                                                   | pm+pt                                                                             |                                                                                   |                                                                                   |
| Protected Phases     |                                                                                   | 8                                                                                 | 5                                                                                 | 2                                                                                 | 6                                                                                 |
| Permitted Phases     | 8                                                                                 |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   |
| Detector Phase       | 8                                                                                 | 8                                                                                 | 5                                                                                 | 2                                                                                 | 6                                                                                 |
| Switch Phase         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Minimum Initial (s)  | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               |
| Minimum Split (s)    | 21.0                                                                              | 21.0                                                                              | 10.0                                                                              | 21.0                                                                              | 21.0                                                                              |
| Total Split (s)      | 55.0                                                                              | 55.0                                                                              | 10.0                                                                              | 55.0                                                                              | 45.0                                                                              |
| Total Split (%)      | 50.0%                                                                             | 50.0%                                                                             | 9.1%                                                                              | 50.0%                                                                             | 40.9%                                                                             |
| Yellow Time (s)      | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               |
| All-Red Time (s)     | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               |
| Lost Time Adjust (s) | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              |
| Total Lost Time (s)  | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               |
| Lead/Lag             |                                                                                   |                                                                                   | Lead                                                                              |                                                                                   | Lag                                                                               |
| Lead-Lag Optimize?   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Recall Mode          | Min                                                                               | Min                                                                               | Min                                                                               | C-Max                                                                             | C-Max                                                                             |
| Act Effct Green (s)  | 45.7                                                                              | 45.7                                                                              | 58.3                                                                              | 58.3                                                                              | 47.6                                                                              |
| Actuated g/C Ratio   | 0.42                                                                              | 0.42                                                                              | 0.53                                                                              | 0.53                                                                              | 0.43                                                                              |
| v/c Ratio            | 0.81                                                                              | 0.82                                                                              | 0.14                                                                              | 0.70                                                                              | 0.57                                                                              |
| Control Delay        | 38.0                                                                              | 38.4                                                                              | 10.0                                                                              | 16.0                                                                              | 28.7                                                                              |
| Queue Delay          | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |
| Total Delay          | 38.0                                                                              | 38.4                                                                              | 10.0                                                                              | 16.0                                                                              | 28.7                                                                              |
| LOS                  | D                                                                                 | D                                                                                 | A                                                                                 | B                                                                                 | C                                                                                 |
| Approach Delay       |                                                                                   | 38.2                                                                              |                                                                                   | 15.8                                                                              | 28.7                                                                              |
| Approach LOS         |                                                                                   | D                                                                                 |                                                                                   | B                                                                                 | C                                                                                 |

Intersection Summary

Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 41 (37%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 27.0  
 Intersection Capacity Utilization 132.4%  
 Analysis Period (min) 15

Intersection LOS: C  
 ICU Level of Service H

Splits and Phases: 4: I-40 N. ramp & Unser Blvd

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |
| ø2                                                                                  | ø5                                                                                  | ø6                                                                                  | ø8                                                                                  |
| 55 s                                                                                | 10 s                                                                                | 45 s                                                                                | 55 s                                                                                |

# HCM Signalized Intersection Capacity Analysis 4: I-40 N. ramp & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |  |  |  |  |  |  |   |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations               |                                                                                   |                                                                                   |                                                                                   |  |  |  |  |  |                                                                                     |                                                                                     |  |  |
| Volume (vph)                      | 0                                                                                 | 0                                                                                 | 0                                                                                 | 958                                                                               | 3                                                                                 | 0                                                                                 | 26                                                                                 | 1034                                                                                | 0                                                                                   | 0                                                                                   | 1049                                                                                | 0                                                                                   |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                               | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               |                                                                                   |                                                                                   |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                                | 3.0                                                                                 |                                                                                     |                                                                                     | 3.0                                                                                 |                                                                                     |
| Lane Util. Factor                 |                                                                                   |                                                                                   |                                                                                   | 0.95                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                               | 0.95                                                                                |                                                                                     |                                                                                     | 0.91                                                                                |                                                                                     |
| Frt                               |                                                                                   |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                               | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                |                                                                                     |
| Flt Protected                     |                                                                                   |                                                                                   |                                                                                   | 0.95                                                                              | 0.95                                                                              |                                                                                   | 0.95                                                                               | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 |                                                                                   |                                                                                   |                                                                                   | 1665                                                                              | 1670                                                                              |                                                                                   | 1752                                                                               | 3505                                                                                |                                                                                     |                                                                                     | 5036                                                                                |                                                                                     |
| Flt Permitted                     |                                                                                   |                                                                                   |                                                                                   | 0.95                                                                              | 0.95                                                                              |                                                                                   | 0.13                                                                               | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 |                                                                                   |                                                                                   |                                                                                   | 1665                                                                              | 1670                                                                              |                                                                                   | 232                                                                                | 3505                                                                                |                                                                                     |                                                                                     | 5036                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.95                                                                              | 0.80                                                                               | 0.80                                                                                | 0.80                                                                                | 0.85                                                                                | 0.85                                                                                | 0.85                                                                                |
| Adj. Flow (vph)                   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 1127                                                                              | 4                                                                                 | 0                                                                                 | 32                                                                                 | 1292                                                                                | 0                                                                                   | 0                                                                                   | 1234                                                                                | 0                                                                                   |
| RTOR Reduction (vph)              | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Lane Group Flow (vph)             | 0                                                                                 | 0                                                                                 | 0                                                                                 | 563                                                                               | 568                                                                               | 0                                                                                 | 32                                                                                 | 1292                                                                                | 0                                                                                   | 0                                                                                   | 1234                                                                                | 0                                                                                   |
| Turn Type                         |                                                                                   |                                                                                   |                                                                                   | Perm                                                                              |                                                                                   | Free                                                                              | pm+pt                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Protected Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | 5                                                                                  | 2                                                                                   |                                                                                     |                                                                                     | 6                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   | 8                                                                                 |                                                                                   | Free                                                                              | 2                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Green, G (s)             |                                                                                   |                                                                                   |                                                                                   | 43.7                                                                              | 43.7                                                                              |                                                                                   | 56.3                                                                               | 56.3                                                                                |                                                                                     |                                                                                     | 45.6                                                                                |                                                                                     |
| Effective Green, g (s)            |                                                                                   |                                                                                   |                                                                                   | 45.7                                                                              | 45.7                                                                              |                                                                                   | 58.3                                                                               | 58.3                                                                                |                                                                                     |                                                                                     | 47.6                                                                                |                                                                                     |
| Actuated g/C Ratio                |                                                                                   |                                                                                   |                                                                                   | 0.42                                                                              | 0.42                                                                              |                                                                                   | 0.53                                                                               | 0.53                                                                                |                                                                                     |                                                                                     | 0.43                                                                                |                                                                                     |
| Clearance Time (s)                |                                                                                   |                                                                                   |                                                                                   | 5.0                                                                               | 5.0                                                                               |                                                                                   | 5.0                                                                                | 5.0                                                                                 |                                                                                     |                                                                                     | 5.0                                                                                 |                                                                                     |
| Vehicle Extension (s)             |                                                                                   |                                                                                   |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                                | 3.0                                                                                 |                                                                                     |                                                                                     | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                |                                                                                   |                                                                                   |                                                                                   | 692                                                                               | 694                                                                               |                                                                                   | 229                                                                                | 1858                                                                                |                                                                                     |                                                                                     | 2179                                                                                |                                                                                     |
| v/s Ratio Prot                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0.01                                                                               | c0.37                                                                               |                                                                                     |                                                                                     | 0.25                                                                                |                                                                                     |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   | 0.34                                                                              | 0.34                                                                              |                                                                                   | 0.06                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/c Ratio                         |                                                                                   |                                                                                   |                                                                                   | 0.81                                                                              | 0.82                                                                              |                                                                                   | 0.14                                                                               | 0.70                                                                                |                                                                                     |                                                                                     | 0.57                                                                                |                                                                                     |
| Uniform Delay, d1                 |                                                                                   |                                                                                   |                                                                                   | 28.4                                                                              | 28.5                                                                              |                                                                                   | 14.5                                                                               | 19.2                                                                                |                                                                                     |                                                                                     | 23.4                                                                                |                                                                                     |
| Progression Factor                |                                                                                   |                                                                                   |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 0.60                                                                               | 0.68                                                                                |                                                                                     |                                                                                     | 1.16                                                                                |                                                                                     |
| Incremental Delay, d2             |                                                                                   |                                                                                   |                                                                                   | 7.3                                                                               | 7.5                                                                               |                                                                                   | 0.2                                                                                | 1.8                                                                                 |                                                                                     |                                                                                     | 0.1                                                                                 |                                                                                     |
| Delay (s)                         |                                                                                   |                                                                                   |                                                                                   | 35.7                                                                              | 35.9                                                                              |                                                                                   | 9.0                                                                                | 14.9                                                                                |                                                                                     |                                                                                     | 27.3                                                                                |                                                                                     |
| Level of Service                  |                                                                                   |                                                                                   |                                                                                   | D                                                                                 | D                                                                                 |                                                                                   | A                                                                                  | B                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   | 35.8                                                                              |                                                                                   |                                                                                    | 14.7                                                                                |                                                                                     |                                                                                     | 27.3                                                                                |                                                                                     |
| Approach LOS                      |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                    | B                                                                                   |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |
| <b>Intersection Summary</b>       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM Average Control Delay         |                                                                                   |                                                                                   | 25.4                                                                              |                                                                                   |                                                                                   | HCM Level of Service                                                              |                                                                                    |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |
| HCM Volume to Capacity ratio      |                                                                                   |                                                                                   | 0.75                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         |                                                                                   |                                                                                   | 110.0                                                                             |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                    |                                                                                     | 6.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 132.4%                                                                            |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                    |                                                                                     | H                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

Timings  
4: I-40 N. ramp & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                      |  |  |  |  |  |
|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Lane Group           | WBL                                                                               | WBT                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               |
| Lane Configurations  |  |  |  |  |  |
| Volume (vph)         | 958                                                                               | 3                                                                                 | 26                                                                                | 1034                                                                              | 1049                                                                              |
| Turn Type            | Perm                                                                              |                                                                                   | pm+pt                                                                             |                                                                                   |                                                                                   |
| Protected Phases     |                                                                                   | 8                                                                                 | 5                                                                                 | 2                                                                                 | 6                                                                                 |
| Permitted Phases     | 8                                                                                 |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   |
| Detector Phase       | 8                                                                                 | 8                                                                                 | 5                                                                                 | 2                                                                                 | 6                                                                                 |
| Switch Phase         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Minimum Initial (s)  | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               | 5.0                                                                               |
| Minimum Split (s)    | 21.0                                                                              | 21.0                                                                              | 10.0                                                                              | 21.0                                                                              | 21.0                                                                              |
| Total Split (s)      | 60.0                                                                              | 60.0                                                                              | 10.0                                                                              | 60.0                                                                              | 50.0                                                                              |
| Total Split (%)      | 50.0%                                                                             | 50.0%                                                                             | 8.3%                                                                              | 50.0%                                                                             | 41.7%                                                                             |
| Yellow Time (s)      | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               | 4.0                                                                               |
| All-Red Time (s)     | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               | 1.0                                                                               |
| Lost Time Adjust (s) | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              | -2.0                                                                              |
| Total Lost Time (s)  | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               |
| Lead/Lag             |                                                                                   |                                                                                   | Lead                                                                              |                                                                                   | Lag                                                                               |
| Lead-Lag Optimize?   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Recall Mode          | Min                                                                               | Min                                                                               | Min                                                                               | C-Max                                                                             | C-Max                                                                             |
| Act Effct Green (s)  | 49.7                                                                              | 49.7                                                                              | 64.3                                                                              | 64.3                                                                              | 53.4                                                                              |
| Actuated g/C Ratio   | 0.41                                                                              | 0.41                                                                              | 0.54                                                                              | 0.54                                                                              | 0.44                                                                              |
| v/c Ratio            | 0.82                                                                              | 0.82                                                                              | 0.14                                                                              | 0.69                                                                              | 0.55                                                                              |
| Control Delay        | 41.0                                                                              | 41.3                                                                              | 15.7                                                                              | 17.7                                                                              | 27.1                                                                              |
| Queue Delay          | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |
| Total Delay          | 41.0                                                                              | 41.3                                                                              | 15.7                                                                              | 17.7                                                                              | 27.1                                                                              |
| LOS                  | D                                                                                 | D                                                                                 | B                                                                                 | B                                                                                 | C                                                                                 |
| Approach Delay       |                                                                                   | 41.1                                                                              |                                                                                   | 17.6                                                                              | 27.1                                                                              |
| Approach LOS         |                                                                                   | D                                                                                 |                                                                                   | B                                                                                 | C                                                                                 |

Intersection Summary

Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 108 (90%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 28.0  
 Intersection Capacity Utilization 132.4%  
 Analysis Period (min) 15

Intersection LOS: C  
 ICU Level of Service H

Splits and Phases: 4: I-40 N. ramp & Unser Blvd

|                                                                                     |    |                                                                                     |      |
|-------------------------------------------------------------------------------------|----|-------------------------------------------------------------------------------------|------|
|  | ø2 |                                                                                     |      |
| 60 s                                                                                |    |                                                                                     |      |
|  | ø5 |  | ø6   |
| 10 s                                                                                |    | 50 s                                                                                |      |
|                                                                                     |    |                                                                                     | ø8   |
|                                                                                     |    |                                                                                     | 60 s |

# HCM Signalized Intersection Capacity Analysis 4: I-40 N. ramp & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |  |      |        |      |      |                      |       |       |      |      |      |      |
|-----------------------------------|------------------------------------------------------------------------------------|------|--------|------|------|----------------------|-------|-------|------|------|------|------|
| Movement                          | EBL                                                                                | EBT  | EBR    | WBL  | WBT  | WBR                  | NBL   | NBT   | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations               |                                                                                    |      |        |      |      |                      |       |       |      |      |      |      |
| Volume (vph)                      | 0                                                                                  | 0    | 0      | 958  | 3    | 0                    | 26    | 1034  | 0    | 0    | 1049 | 0    |
| Ideal Flow (vphpl)                | 1900                                                                               | 1900 | 1900   | 1900 | 1900 | 1900                 | 1900  | 1900  | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s)               |                                                                                    |      |        | 3.0  | 3.0  |                      | 3.0   | 3.0   |      |      | 3.0  |      |
| Lane Util. Factor                 |                                                                                    |      |        | 0.95 | 0.95 |                      | 1.00  | 0.95  |      |      | 0.91 |      |
| Frt                               |                                                                                    |      |        | 1.00 | 1.00 |                      | 1.00  | 1.00  |      |      | 1.00 |      |
| Flt Protected                     |                                                                                    |      |        | 0.95 | 0.95 |                      | 0.95  | 1.00  |      |      | 1.00 |      |
| Satd. Flow (prot)                 |                                                                                    |      |        | 1665 | 1670 |                      | 1752  | 3505  |      |      | 5036 |      |
| Flt Permitted                     |                                                                                    |      |        | 0.95 | 0.95 |                      | 0.13  | 1.00  |      |      | 1.00 |      |
| Satd. Flow (perm)                 |                                                                                    |      |        | 1665 | 1670 |                      | 239   | 3505  |      |      | 5036 |      |
| Peak-hour factor, PHF             | 0.85                                                                               | 0.85 | 0.85   | 0.85 | 0.85 | 0.95                 | 0.80  | 0.80  | 0.80 | 0.85 | 0.85 | 0.85 |
| Adj. Flow (vph)                   | 0                                                                                  | 0    | 0      | 1127 | 4    | 0                    | 32    | 1292  | 0    | 0    | 1234 | 0    |
| RTOR Reduction (vph)              | 0                                                                                  | 0    | 0      | 0    | 0    | 0                    | 0     | 0     | 0    | 0    | 0    | 0    |
| Lane Group Flow (vph)             | 0                                                                                  | 0    | 0      | 563  | 568  | 0                    | 32    | 1292  | 0    | 0    | 1234 | 0    |
| Turn Type                         |                                                                                    |      |        | Perm |      | Free                 | pm+pt |       |      |      |      |      |
| Protected Phases                  |                                                                                    |      |        |      | 8    |                      | 5     | 2     |      |      | 6    |      |
| Permitted Phases                  |                                                                                    |      |        | 8    |      | Free                 | 2     |       |      |      |      |      |
| Actuated Green, G (s)             |                                                                                    |      |        | 47.7 | 47.7 |                      | 62.3  | 62.3  |      |      | 51.4 |      |
| Effective Green, g (s)            |                                                                                    |      |        | 49.7 | 49.7 |                      | 64.3  | 64.3  |      |      | 53.4 |      |
| Actuated g/C Ratio                |                                                                                    |      |        | 0.41 | 0.41 |                      | 0.54  | 0.54  |      |      | 0.44 |      |
| Clearance Time (s)                |                                                                                    |      |        | 5.0  | 5.0  |                      | 5.0   | 5.0   |      |      | 5.0  |      |
| Vehicle Extension (s)             |                                                                                    |      |        | 3.0  | 3.0  |                      | 3.0   | 3.0   |      |      | 3.0  |      |
| Lane Grp Cap (vph)                |                                                                                    |      |        | 690  | 692  |                      | 228   | 1878  |      |      | 2241 |      |
| v/s Ratio Prot                    |                                                                                    |      |        |      |      |                      | 0.01  | c0.37 |      |      | 0.25 |      |
| v/s Ratio Perm                    |                                                                                    |      |        | 0.34 | 0.34 |                      | 0.07  |       |      |      |      |      |
| v/c Ratio                         |                                                                                    |      |        | 0.82 | 0.82 |                      | 0.14  | 0.69  |      |      | 0.55 |      |
| Uniform Delay, d1                 |                                                                                    |      |        | 31.1 | 31.2 |                      | 15.4  | 20.5  |      |      | 24.5 |      |
| Progression Factor                |                                                                                    |      |        | 1.00 | 1.00 |                      | 0.93  | 0.72  |      |      | 1.05 |      |
| Incremental Delay, d2             |                                                                                    |      |        | 7.4  | 7.7  |                      | 0.2   | 1.7   |      |      | 0.1  |      |
| Delay (s)                         |                                                                                    |      |        | 38.5 | 38.9 |                      | 14.5  | 16.5  |      |      | 25.8 |      |
| Level of Service                  |                                                                                    |      |        | D    | D    |                      | B     | B     |      |      | C    |      |
| Approach Delay (s)                |                                                                                    | 0.0  |        |      | 38.7 |                      |       | 16.5  |      |      | 25.8 |      |
| Approach LOS                      |                                                                                    | A    |        |      | D    |                      |       | B     |      |      | C    |      |
| <b>Intersection Summary</b>       |                                                                                    |      |        |      |      |                      |       |       |      |      |      |      |
| HCM Average Control Delay         |                                                                                    |      | 26.4   |      |      | HCM Level of Service |       |       |      | C    |      |      |
| HCM Volume to Capacity ratio      |                                                                                    |      | 0.75   |      |      |                      |       |       |      |      |      |      |
| Actuated Cycle Length (s)         |                                                                                    |      | 120.0  |      |      | Sum of lost time (s) |       |       |      | 6.0  |      |      |
| Intersection Capacity Utilization |                                                                                    |      | 132.4% |      |      | ICU Level of Service |       |       |      | H    |      |      |
| Analysis Period (min)             |                                                                                    |      | 15     |      |      |                      |       |       |      |      |      |      |
| c Critical Lane Group             |                                                                                    |      |        |      |      |                      |       |       |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis 5: I-40 S. ramp & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |  |  |  |  |  |  |  |                                                                                         |  |  |                                                                                         |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                                                                                                        | NBR                                                                                 | SBL                                                                                 | SBT                                                                                                                                                                        | SBR                                                                                 |
| Lane Configurations               |  |                                                                                   |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    | <br> |                                                                                     |                                                                                     | <br> |                                                                                     |
| Volume (veh/h)                    | 89                                                                                | 0                                                                                 | 43                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 689                                                                                                                                                                        | 0                                                                                   | 0                                                                                   | 2272                                                                                                                                                                       | 0                                                                                   |
| Sign Control                      |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                    | Free                                                                                                                                                                       |                                                                                     |                                                                                     | Free                                                                                                                                                                       |                                                                                     |
| Grade                             |                                                                                   | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                |                                                                                   |                                                                                    | 0%                                                                                                                                                                         |                                                                                     |                                                                                     | 0%                                                                                                                                                                         |                                                                                     |
| Peak Hour Factor                  | 0.78                                                                              | 0.78                                                                              | 0.78                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                               | 0.85                                                                                                                                                                       | 0.85                                                                                | 0.85                                                                                | 0.85                                                                                                                                                                       | 0.85                                                                                |
| Hourly flow rate (vph)            | 114                                                                               | 0                                                                                 | 55                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 811                                                                                                                                                                        | 0                                                                                   | 0                                                                                   | 2673                                                                                                                                                                       | 0                                                                                   |
| Pedestrians                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Lane Width (ft)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Walking Speed (ft/s)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Percent Blockage                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Right turn flare (veh)            |                                                                                   |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Median type                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | Raised                                                                                                                                                                     |                                                                                     |                                                                                     | Raised                                                                                                                                                                     |                                                                                     |
| Median storage veh                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 1                                                                                                                                                                          |                                                                                     |                                                                                     | 1                                                                                                                                                                          |                                                                                     |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| pX, platoon unblocked             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| vC, conflicting volume            | 3078                                                                              | 3484                                                                              | 1336                                                                              | 2147                                                                              | 3484                                                                              | 405                                                                               | 2673                                                                               |                                                                                                                                                                            |                                                                                     | 811                                                                                 |                                                                                                                                                                            |                                                                                     |
| vC1, stage 1 conf vol             | 2673                                                                              | 2673                                                                              |                                                                                   | 811                                                                               | 811                                                                               |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| vC2, stage 2 conf vol             | 405                                                                               | 811                                                                               |                                                                                   | 1336                                                                              | 2673                                                                              |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| vCu, unblocked vol                | 3078                                                                              | 3484                                                                              | 1336                                                                              | 2147                                                                              | 3484                                                                              | 405                                                                               | 2673                                                                               |                                                                                                                                                                            |                                                                                     | 811                                                                                 |                                                                                                                                                                            |                                                                                     |
| tC, single (s)                    | 7.6                                                                               | 6.6                                                                               | 7.0                                                                               | 7.6                                                                               | 6.6                                                                               | 7.0                                                                               | 4.2                                                                                |                                                                                                                                                                            |                                                                                     | 4.2                                                                                 |                                                                                                                                                                            |                                                                                     |
| tC, 2 stage (s)                   | 6.6                                                                               | 5.6                                                                               |                                                                                   | 6.6                                                                               | 5.6                                                                               |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| tF (s)                            | 3.5                                                                               | 4.0                                                                               | 3.3                                                                               | 3.5                                                                               | 4.0                                                                               | 3.3                                                                               | 2.2                                                                                |                                                                                                                                                                            |                                                                                     | 2.2                                                                                 |                                                                                                                                                                            |                                                                                     |
| p0 queue free %                   | 0                                                                                 | 100                                                                               | 61                                                                                | 100                                                                               | 100                                                                               | 100                                                                               | 100                                                                                |                                                                                                                                                                            |                                                                                     | 100                                                                                 |                                                                                                                                                                            |                                                                                     |
| cM capacity (veh/h)               | 20                                                                                | 38                                                                                | 142                                                                               | 74                                                                                | 38                                                                                | 592                                                                               | 151                                                                                |                                                                                                                                                                            |                                                                                     | 805                                                                                 |                                                                                                                                                                            |                                                                                     |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | NB 2                                                                              | SB 1                                                                              | SB 2                                                                              |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Volume Total                      | 169                                                                               | 405                                                                               | 405                                                                               | 1336                                                                              | 1336                                                                              |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Volume Left                       | 114                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Volume Right                      | 55                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| cSH                               | 28                                                                                | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Volume to Capacity                | 6.14                                                                              | 0.24                                                                              | 0.24                                                                              | 0.79                                                                              | 0.79                                                                              |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Queue Length 95th (ft)            | Err                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Control Delay (s)                 | Err                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Lane LOS                          | F                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Approach Delay (s)                | Err                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Approach LOS                      | F                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Average Delay                     |                                                                                   | 463.2                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 74.4%                                                                             | ICU Level of Service                                                              | D                                                                                 |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |

2012 AM Peak NO BUILD Conditions

Existing Geometry  
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# HCM Unsignalized Intersection Capacity Analysis 5: I-40 S. ramp & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|
|                                   |  |  |  |  |  |  |  |                                                                                         |  |  |                                                                                         |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                | NBT                                                                                                                                                                        | NBR                                                                                 | SBL                                                                                 | SBT                                                                                                                                                                        | SBR                                                                                 |  |  |  |  |  |  |  |  |  |  |  |
| Lane Configurations               |  |                                                                                   |  |                                                                                   |                                                                                   |                                                                                   |                                                                                    | <br> |                                                                                     |                                                                                     | <br> |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Volume (veh/h)                    | 89                                                                                | 0                                                                                 | 43                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 689                                                                                                                                                                        | 0                                                                                   | 0                                                                                   | 2272                                                                                                                                                                       | 0                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Sign Control                      | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Free                                                                               |                                                                                                                                                                            |                                                                                     | Free                                                                                |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                 |                                                                                                                                                                            |                                                                                     | 0%                                                                                  |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Peak Hour Factor                  | 0.78                                                                              | 0.78                                                                              | 0.78                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                               | 0.85                                                                                                                                                                       | 0.85                                                                                | 0.85                                                                                | 0.85                                                                                                                                                                       | 0.85                                                                                |  |  |  |  |  |  |  |  |  |  |  |
| Hourly flow rate (vph)            | 114                                                                               | 0                                                                                 | 55                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                  | 811                                                                                                                                                                        | 0                                                                                   | 0                                                                                   | 2673                                                                                                                                                                       | 0                                                                                   |  |  |  |  |  |  |  |  |  |  |  |
| Pedestrians                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Lane Width (ft)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Walking Speed (ft/s)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Percent Blockage                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Right turn flare (veh)            | 6                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Median type                       | Raised                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Median storage (veh)              | 1                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| pX, platoon unblocked             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| vC, conflicting volume            | 3078                                                                              | 3484                                                                              | 1336                                                                              | 2147                                                                              | 3484                                                                              | 405                                                                               | 2673                                                                               |                                                                                                                                                                            |                                                                                     | 811                                                                                 |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| vC1, stage 1 conf vol             | 2673                                                                              | 2673                                                                              |                                                                                   | 811                                                                               | 811                                                                               |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| vC2, stage 2 conf vol             | 405                                                                               | 811                                                                               |                                                                                   | 1336                                                                              | 2673                                                                              |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| vCu, unblocked vol                | 3078                                                                              | 3484                                                                              | 1336                                                                              | 2147                                                                              | 3484                                                                              | 405                                                                               | 2673                                                                               |                                                                                                                                                                            |                                                                                     | 811                                                                                 |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| tC, single (s)                    | 7.6                                                                               | 6.6                                                                               | 7.0                                                                               | 7.6                                                                               | 6.6                                                                               | 7.0                                                                               | 4.2                                                                                |                                                                                                                                                                            |                                                                                     | 4.2                                                                                 |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| tC, 2 stage (s)                   | 6.6                                                                               | 5.6                                                                               |                                                                                   | 6.6                                                                               | 5.6                                                                               |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| tF (s)                            | 3.5                                                                               | 4.0                                                                               | 3.3                                                                               | 3.5                                                                               | 4.0                                                                               | 3.3                                                                               | 2.2                                                                                |                                                                                                                                                                            |                                                                                     | 2.2                                                                                 |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| p0 queue free %                   | 0                                                                                 | 100                                                                               | 61                                                                                | 100                                                                               | 100                                                                               | 100                                                                               | 100                                                                                |                                                                                                                                                                            |                                                                                     | 100                                                                                 |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| cM capacity (veh/h)               | 20                                                                                | 38                                                                                | 142                                                                               | 74                                                                                | 38                                                                                | 592                                                                               | 151                                                                                |                                                                                                                                                                            |                                                                                     | 805                                                                                 |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | NB 2                                                                              | SB 1                                                                              | SB 2                                                                              |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Volume Total                      | 169                                                                               | 405                                                                               | 405                                                                               | 1336                                                                              | 1336                                                                              |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Volume Left                       | 114                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Volume Right                      | 55                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| cSH                               | 28                                                                                | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Volume to Capacity                | 6.14                                                                              | 0.24                                                                              | 0.24                                                                              | 0.79                                                                              | 0.79                                                                              |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Queue Length 95th (ft)            | Err                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Control Delay (s)                 | Err                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Lane LOS                          | F                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Approach Delay (s)                | Err                                                                               | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Approach LOS                      | F                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Average Delay                     | 463.2                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Intersection Capacity Utilization | 74.4%                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
| Analysis Period (min)             | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |
|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |  |  |  |  |  |  |  |  |  |  |  |

2012 AM Peak BUILD Conditions

Existing Geometry  
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# HCM Unsignalized Intersection Capacity Analysis 5: I-40 S. ramp & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                   |  |  |  |  |  |  |  |                                                                                         |  |  |                                                                                         |  |
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                                                                                                        | NBR                                                                                 | SBL                                                                                 | SBT                                                                                                                                                                        | SBR                                                                                 |
| Lane Configurations               |  |                                                                                   |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | <br> |                                                                                     |                                                                                     | <br> |                                                                                     |
| Volume (veh/h)                    | 134                                                                               | 0                                                                                 | 52                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 1060                                                                                                                                                                       | 0                                                                                   | 0                                                                                   | 1547                                                                                                                                                                       | 0                                                                                   |
| Sign Control                      |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Free                                                                                                                                                                       |                                                                                     |                                                                                     | Free                                                                                                                                                                       |                                                                                     |
| Grade                             |                                                                                   | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                                                                                                         |                                                                                     |                                                                                     | 0%                                                                                                                                                                         |                                                                                     |
| Peak Hour Factor                  | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.80                                                                              | 0.80                                                                                                                                                                       | 0.80                                                                                | 0.94                                                                                | 0.94                                                                                                                                                                       | 0.94                                                                                |
| Hourly flow rate (vph)            | 156                                                                               | 0                                                                                 | 60                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 1325                                                                                                                                                                       | 0                                                                                   | 0                                                                                   | 1646                                                                                                                                                                       | 0                                                                                   |
| Pedestrians                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Lane Width (ft)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Walking Speed (ft/s)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Percent Blockage                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Right turn flare (veh)            |                                                                                   |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Median type                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | Raised                                                                                                                                                                     |                                                                                     |                                                                                     | Raised                                                                                                                                                                     |                                                                                     |
| Median storage (veh)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 1                                                                                                                                                                          |                                                                                     |                                                                                     | 1                                                                                                                                                                          |                                                                                     |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| pX, platoon unblocked             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| vC, conflicting volume            | 2308                                                                              | 2971                                                                              | 823                                                                               | 2148                                                                              | 2971                                                                              | 662                                                                               | 1646                                                                              |                                                                                                                                                                            |                                                                                     | 1325                                                                                |                                                                                                                                                                            |                                                                                     |
| vC1, stage 1 conf vol             | 1646                                                                              | 1646                                                                              |                                                                                   | 1325                                                                              | 1325                                                                              |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| vC2, stage 2 conf vol             | 662                                                                               | 1325                                                                              |                                                                                   | 823                                                                               | 1646                                                                              |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| vCu, unblocked vol                | 2308                                                                              | 2971                                                                              | 823                                                                               | 2148                                                                              | 2971                                                                              | 662                                                                               | 1646                                                                              |                                                                                                                                                                            |                                                                                     | 1325                                                                                |                                                                                                                                                                            |                                                                                     |
| tC, single (s)                    | 7.6                                                                               | 6.6                                                                               | 7.0                                                                               | 7.6                                                                               | 6.6                                                                               | 7.0                                                                               | 4.2                                                                               |                                                                                                                                                                            |                                                                                     | 4.2                                                                                 |                                                                                                                                                                            |                                                                                     |
| tC, 2 stage (s)                   | 6.6                                                                               | 5.6                                                                               |                                                                                   | 6.6                                                                               | 5.6                                                                               |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| tF (s)                            | 3.5                                                                               | 4.0                                                                               | 3.3                                                                               | 3.5                                                                               | 4.0                                                                               | 3.3                                                                               | 2.2                                                                               |                                                                                                                                                                            |                                                                                     | 2.2                                                                                 |                                                                                                                                                                            |                                                                                     |
| p0 queue free %                   | 0                                                                                 | 100                                                                               | 81                                                                                | 100                                                                               | 100                                                                               | 100                                                                               | 100                                                                               |                                                                                                                                                                            |                                                                                     | 100                                                                                 |                                                                                                                                                                            |                                                                                     |
| cM capacity (veh/h)               | 81                                                                                | 89                                                                                | 315                                                                               | 102                                                                               | 89                                                                                | 402                                                                               | 384                                                                               |                                                                                                                                                                            |                                                                                     | 512                                                                                 |                                                                                                                                                                            |                                                                                     |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | NB 2                                                                              | SB 1                                                                              | SB 2                                                                              |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Volume Total                      | 216                                                                               | 662                                                                               | 662                                                                               | 823                                                                               | 823                                                                               |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Volume Left                       | 156                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Volume Right                      | 60                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| cSH                               | 104                                                                               | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Volume to Capacity                | 2.08                                                                              | 0.39                                                                              | 0.39                                                                              | 0.48                                                                              | 0.48                                                                              |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Queue Length 95th (ft)            | 461                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Control Delay (s)                 | 583.6                                                                             | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Lane LOS                          | F                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Approach Delay (s)                | 583.6                                                                             | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Approach LOS                      | F                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Average Delay                     |                                                                                   | 39.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 117.9%                                                                            |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                            | H                                                                                   |                                                                                     |                                                                                                                                                                            |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                                                                                                            |                                                                                     |

2012 PM Peak NO BUILD Conditions

Existing Geometry  
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# HCM Unsignalized Intersection Capacity Analysis 5: I-40 S. ramp & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                   |  |  |  |  |  |  |  |                                                                                      |  |  |                                                                                      |  |
| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                                                                                                                     | NBR                                                                                 | SBL                                                                                 | SBT                                                                                                                                                                     | SBR                                                                                 |
| Lane Configurations               |  |                                                                                   |  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |   |                                                                                     |                                                                                     |   |                                                                                     |
| Volume (veh/h)                    | 134                                                                               | 0                                                                                 | 52                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 1060                                                                                                                                                                    | 0                                                                                   | 0                                                                                   | 1547                                                                                                                                                                    | 0                                                                                   |
| Sign Control                      |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Free                                                                                                                                                                    |                                                                                     |                                                                                     | Free                                                                                                                                                                    |                                                                                     |
| Grade                             |                                                                                   | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                                                                                                      |                                                                                     |                                                                                     | 0%                                                                                                                                                                      |                                                                                     |
| Peak Hour Factor                  | 0.86                                                                              | 0.86                                                                              | 0.86                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.80                                                                              | 0.80                                                                                                                                                                    | 0.80                                                                                | 0.94                                                                                | 0.94                                                                                                                                                                    | 0.94                                                                                |
| Hourly flow rate (vph)            | 156                                                                               | 0                                                                                 | 60                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 1325                                                                                                                                                                    | 0                                                                                   | 0                                                                                   | 1646                                                                                                                                                                    | 0                                                                                   |
| Pedestrians                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Lane Width (ft)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Walking Speed (ft/s)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Percent Blockage                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Right turn flare (veh)            |                                                                                   |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Median type                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | Raised                                                                                                                                                                  |                                                                                     |                                                                                     | Raised                                                                                                                                                                  |                                                                                     |
| Median storage (veh)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 1                                                                                                                                                                       |                                                                                     |                                                                                     | 1                                                                                                                                                                       |                                                                                     |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| pX, platoon unblocked             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| vC, conflicting volume            | 2308                                                                              | 2971                                                                              | 823                                                                               | 2148                                                                              | 2971                                                                              | 662                                                                               | 1646                                                                              |                                                                                                                                                                         |                                                                                     | 1325                                                                                |                                                                                                                                                                         |                                                                                     |
| vC1, stage 1 conf vol             | 1646                                                                              | 1646                                                                              |                                                                                   | 1325                                                                              | 1325                                                                              |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| vC2, stage 2 conf vol             | 662                                                                               | 1325                                                                              |                                                                                   | 823                                                                               | 1646                                                                              |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| vCu, unblocked vol                | 2308                                                                              | 2971                                                                              | 823                                                                               | 2148                                                                              | 2971                                                                              | 662                                                                               | 1646                                                                              |                                                                                                                                                                         |                                                                                     | 1325                                                                                |                                                                                                                                                                         |                                                                                     |
| tC, single (s)                    | 7.6                                                                               | 6.6                                                                               | 7.0                                                                               | 7.6                                                                               | 6.6                                                                               | 7.0                                                                               | 4.2                                                                               |                                                                                                                                                                         |                                                                                     | 4.2                                                                                 |                                                                                                                                                                         |                                                                                     |
| tC, 2 stage (s)                   | 6.6                                                                               | 5.6                                                                               |                                                                                   | 6.6                                                                               | 5.6                                                                               |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| tF (s)                            | 3.5                                                                               | 4.0                                                                               | 3.3                                                                               | 3.5                                                                               | 4.0                                                                               | 3.3                                                                               | 2.2                                                                               |                                                                                                                                                                         |                                                                                     | 2.2                                                                                 |                                                                                                                                                                         |                                                                                     |
| p0 queue free %                   | 0                                                                                 | 100                                                                               | 81                                                                                | 100                                                                               | 100                                                                               | 100                                                                               | 100                                                                               |                                                                                                                                                                         |                                                                                     | 100                                                                                 |                                                                                                                                                                         |                                                                                     |
| cM capacity (veh/h)               | 81                                                                                | 89                                                                                | 315                                                                               | 102                                                                               | 89                                                                                | 402                                                                               | 384                                                                               |                                                                                                                                                                         |                                                                                     | 512                                                                                 |                                                                                                                                                                         |                                                                                     |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | NB 2                                                                              | SB 1                                                                              | SB 2                                                                              |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Volume Total                      | 216                                                                               | 662                                                                               | 662                                                                               | 823                                                                               | 823                                                                               |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Volume Left                       | 156                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Volume Right                      | 60                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| cSH                               | 104                                                                               | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Volume to Capacity                | 2.08                                                                              | 0.39                                                                              | 0.39                                                                              | 0.48                                                                              | 0.48                                                                              |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Queue Length 95th (ft)            | 461                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Control Delay (s)                 | 583.6                                                                             | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Lane LOS                          | F                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Approach Delay (s)                | 583.6                                                                             | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Approach LOS                      | F                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Average Delay                     |                                                                                   | 39.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Intersection Capacity Utilization |                                                                                   | 117.9%                                                                            | ICU Level of Service                                                              | H                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                                                                                                         |                                                                                     |

# HCM Unsignalized Intersection Capacity Analysis 6: Saul Bell & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7



| Movement                          | EBL  | EBR  | NBL   | NBT  | SBT                  | SBR  |      |
|-----------------------------------|------|------|-------|------|----------------------|------|------|
| Lane Configurations               |      | ↗    | ↖     | ↕    | ↕                    | ↗    |      |
| Volume (veh/h)                    | 0    | 6    | 0     | 1424 | 1708                 | 12   |      |
| Sign Control                      | Stop |      |       | Free | Free                 |      |      |
| Grade                             | 0%   |      |       | 0%   | 0%                   |      |      |
| Peak Hour Factor                  | 0.85 | 0.85 | 0.85  | 0.85 | 0.85                 | 0.85 |      |
| Hourly flow rate (vph)            | 0    | 7    | 0     | 1675 | 2009                 | 14   |      |
| Pedestrians                       |      |      |       |      |                      |      |      |
| Lane Width (ft)                   |      |      |       |      |                      |      |      |
| Walking Speed (ft/s)              |      |      |       |      |                      |      |      |
| Percent Blockage                  |      |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |      |       |      |                      |      |      |
| Median type                       |      |      |       | None | None                 |      |      |
| Median storage veh                |      |      |       |      |                      |      |      |
| Upstream signal (ft)              |      |      |       | 933  | 789                  |      |      |
| pX, platoon unblocked             | 0.65 | 0.49 | 0.49  |      |                      |      |      |
| vC, conflicting volume            | 2847 | 1005 | 2024  |      |                      |      |      |
| vC1, stage 1 conf vol             |      |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |      |       |      |                      |      |      |
| vCu, unblocked vol                | 469  | 0    | 987   |      |                      |      |      |
| tC, single (s)                    | 6.9  | 7.0  | 4.2   |      |                      |      |      |
| tC, 2 stage (s)                   |      |      |       |      |                      |      |      |
| tF (s)                            | 3.5  | 3.3  | 2.2   |      |                      |      |      |
| p0 queue free %                   | 100  | 99   | 100   |      |                      |      |      |
| cM capacity (veh/h)               | 339  | 524  | 335   |      |                      |      |      |
| Direction, Lane #                 | EB 1 | NB 1 | NB 2  | NB 3 | SB 1                 | SB 2 | SB 3 |
| Volume Total                      | 7    | 0    | 838   | 838  | 1005                 | 1005 | 14   |
| Volume Left                       | 0    | 0    | 0     | 0    | 0                    | 0    | 0    |
| Volume Right                      | 7    | 0    | 0     | 0    | 0                    | 0    | 14   |
| cSH                               | 524  | 1700 | 1700  | 1700 | 1700                 | 1700 | 1700 |
| Volume to Capacity                | 0.01 | 0.00 | 0.49  | 0.49 | 0.59                 | 0.59 | 0.01 |
| Queue Length 95th (ft)            | 1    | 0    | 0     | 0    | 0                    | 0    | 0    |
| Control Delay (s)                 | 12.0 | 0.0  | 0.0   | 0.0  | 0.0                  | 0.0  | 0.0  |
| Lane LOS                          | B    |      |       |      |                      |      |      |
| Approach Delay (s)                | 12.0 | 0.0  |       |      | 0.0                  |      |      |
| Approach LOS                      | B    |      |       |      |                      |      |      |
| Intersection Summary              |      |      |       |      |                      |      |      |
| Average Delay                     |      |      | 0.0   |      |                      |      |      |
| Intersection Capacity Utilization |      |      | 57.2% |      | ICU Level of Service |      | B    |
| Analysis Period (min)             |      |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis 6: Saul Bell & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|
|                                   |  |  |  |  |  |  |      |
| Movement                          | EBL                                                                               | EBR                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               | SBR                                                                               |      |
| Lane Configurations               |                                                                                   |  |  |  |  |  |      |
| Volume (veh/h)                    | 0                                                                                 | 8                                                                                 | 42                                                                                | 1445                                                                              | 1770                                                                              | 12                                                                                |      |
| Sign Control                      | Stop                                                                              |                                                                                   |                                                                                   | Free                                                                              | Free                                                                              |                                                                                   |      |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                | 0%                                                                                |                                                                                   |      |
| Peak Hour Factor                  | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              |      |
| Hourly flow rate (vph)            | 0                                                                                 | 9                                                                                 | 49                                                                                | 1700                                                                              | 2082                                                                              | 14                                                                                |      |
| Pedestrians                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Lane Width (ft)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Walking Speed (ft/s)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Percent Blockage                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Median type                       |                                                                                   |                                                                                   |                                                                                   | None                                                                              | None                                                                              |                                                                                   |      |
| Median storage veh                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   | 933                                                                               | 789                                                                               |                                                                                   |      |
| pX, platoon unblocked             | 0.66                                                                              | 0.49                                                                              | 0.49                                                                              |                                                                                   |                                                                                   |                                                                                   |      |
| vC, conflicting volume            | 3031                                                                              | 1041                                                                              | 2096                                                                              |                                                                                   |                                                                                   |                                                                                   |      |
| vC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| vC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| vCu, unblocked vol                | 642                                                                               | 0                                                                                 | 1140                                                                              |                                                                                   |                                                                                   |                                                                                   |      |
| tC, single (s)                    | 6.9                                                                               | 7.0                                                                               | 4.2                                                                               |                                                                                   |                                                                                   |                                                                                   |      |
| tC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| tF (s)                            | 3.5                                                                               | 3.3                                                                               | 2.2                                                                               |                                                                                   |                                                                                   |                                                                                   |      |
| p0 queue free %                   | 100                                                                               | 98                                                                                | 83                                                                                |                                                                                   |                                                                                   |                                                                                   |      |
| cM capacity (veh/h)               | 223                                                                               | 525                                                                               | 293                                                                               |                                                                                   |                                                                                   |                                                                                   |      |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | NB 2                                                                              | NB 3                                                                              | SB 1                                                                              | SB 2                                                                              | SB 3 |
| Volume Total                      | 9                                                                                 | 49                                                                                | 850                                                                               | 850                                                                               | 1041                                                                              | 1041                                                                              | 14   |
| Volume Left                       | 0                                                                                 | 49                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    |
| Volume Right                      | 9                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 14   |
| cSH                               | 525                                                                               | 293                                                                               | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700 |
| Volume to Capacity                | 0.02                                                                              | 0.17                                                                              | 0.50                                                                              | 0.50                                                                              | 0.61                                                                              | 0.61                                                                              | 0.01 |
| Queue Length 95th (ft)            | 1                                                                                 | 15                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    |
| Control Delay (s)                 | 12.0                                                                              | 19.8                                                                              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0  |
| Lane LOS                          | B                                                                                 | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Approach Delay (s)                | 12.0                                                                              | 0.6                                                                               |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |      |
| Approach LOS                      | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Average Delay                     |                                                                                   |                                                                                   | 0.3                                                                               |                                                                                   |                                                                                   |                                                                                   |      |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 58.9%                                                                             |                                                                                   | ICU Level of Service                                                              |                                                                                   | B    |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |      |

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# HCM Unsignalized Intersection Capacity Analysis 6: Saul Bell & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7



| Movement                          | EBL  | EBR  | NBL   | NBT  | SBT                  | SBR  |      |
|-----------------------------------|------|------|-------|------|----------------------|------|------|
| Lane Configurations               |      | ↗    | ↖     | ↕    | ↕                    | ↗    |      |
| Volume (veh/h)                    | 0    | 6    | 0     | 1332 | 1359                 | 7    |      |
| Sign Control                      | Stop |      |       | Free | Free                 |      |      |
| Grade                             | 0%   |      |       | 0%   | 0%                   |      |      |
| Peak Hour Factor                  | 0.85 | 0.85 | 0.85  | 0.85 | 0.85                 | 0.85 |      |
| Hourly flow rate (vph)            | 0    | 7    | 0     | 1567 | 1599                 | 8    |      |
| Pedestrians                       |      |      |       |      |                      |      |      |
| Lane Width (ft)                   |      |      |       |      |                      |      |      |
| Walking Speed (ft/s)              |      |      |       |      |                      |      |      |
| Percent Blockage                  |      |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |      |       |      |                      |      |      |
| Median type                       |      |      |       | None | None                 |      |      |
| Median storage (veh)              |      |      |       |      |                      |      |      |
| Upstream signal (ft)              |      |      |       | 933  | 789                  |      |      |
| pX, platoon unblocked             | 0.89 | 0.80 | 0.80  |      |                      |      |      |
| vC, conflicting volume            | 2382 | 799  | 1607  |      |                      |      |      |
| vC1, stage 1 conf vol             |      |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |      |       |      |                      |      |      |
| vCu, unblocked vol                | 1374 | 241  | 1254  |      |                      |      |      |
| tC, single (s)                    | 6.9  | 7.0  | 4.2   |      |                      |      |      |
| tC, 2 stage (s)                   |      |      |       |      |                      |      |      |
| tF (s)                            | 3.5  | 3.3  | 2.2   |      |                      |      |      |
| p0 queue free %                   | 100  | 99   | 100   |      |                      |      |      |
| cM capacity (veh/h)               | 120  | 603  | 435   |      |                      |      |      |
| Direction, Lane #                 | EB 1 | NB 1 | NB 2  | NB 3 | SB 1                 | SB 2 | SB 3 |
| Volume Total                      | 7    | 0    | 784   | 784  | 799                  | 799  | 8    |
| Volume Left                       | 0    | 0    | 0     | 0    | 0                    | 0    | 0    |
| Volume Right                      | 7    | 0    | 0     | 0    | 0                    | 0    | 8    |
| cSH                               | 603  | 1700 | 1700  | 1700 | 1700                 | 1700 | 1700 |
| Volume to Capacity                | 0.01 | 0.00 | 0.46  | 0.46 | 0.47                 | 0.47 | 0.00 |
| Queue Length 95th (ft)            | 1    | 0    | 0     | 0    | 0                    | 0    | 0    |
| Control Delay (s)                 | 11.0 | 0.0  | 0.0   | 0.0  | 0.0                  | 0.0  | 0.0  |
| Lane LOS                          | B    |      |       |      |                      |      |      |
| Approach Delay (s)                | 11.0 | 0.0  |       |      | 0.0                  |      |      |
| Approach LOS                      | B    |      |       |      |                      |      |      |
| Intersection Summary              |      |      |       |      |                      |      |      |
| Average Delay                     |      |      | 0.0   |      |                      |      |      |
| Intersection Capacity Utilization |      |      | 47.6% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis 6: Saul Bell & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|
|                                   |  |  |  |  |  |  |      |
| Movement                          | EBL                                                                               | EBR                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               | SBR                                                                               |      |
| Lane Configurations               |                                                                                   |  |  |  |  |  |      |
| Volume (veh/h)                    | 0                                                                                 | 8                                                                                 | 73                                                                                | 1342                                                                              | 1440                                                                              | 7                                                                                 |      |
| Sign Control                      | Stop                                                                              |                                                                                   |                                                                                   | Free                                                                              | Free                                                                              |                                                                                   |      |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                | 0%                                                                                |                                                                                   |      |
| Peak Hour Factor                  | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              |      |
| Hourly flow rate (vph)            | 0                                                                                 | 9                                                                                 | 86                                                                                | 1579                                                                              | 1694                                                                              | 8                                                                                 |      |
| Pedestrians                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Lane Width (ft)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Walking Speed (ft/s)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Percent Blockage                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Median type                       |                                                                                   |                                                                                   |                                                                                   | None                                                                              | None                                                                              |                                                                                   |      |
| Median storage veh                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   | 933                                                                               | 789                                                                               |                                                                                   |      |
| pX, platoon unblocked             | 0.87                                                                              | 0.78                                                                              | 0.78                                                                              |                                                                                   |                                                                                   |                                                                                   |      |
| vC, conflicting volume            | 2655                                                                              | 847                                                                               | 1702                                                                              |                                                                                   |                                                                                   |                                                                                   |      |
| vC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| vC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| vCu, unblocked vol                | 1620                                                                              | 234                                                                               | 1333                                                                              |                                                                                   |                                                                                   |                                                                                   |      |
| tC, single (s)                    | 6.9                                                                               | 7.0                                                                               | 4.2                                                                               |                                                                                   |                                                                                   |                                                                                   |      |
| tC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| tF (s)                            | 3.5                                                                               | 3.3                                                                               | 2.2                                                                               |                                                                                   |                                                                                   |                                                                                   |      |
| p0 queue free %                   | 100                                                                               | 98                                                                                | 78                                                                                |                                                                                   |                                                                                   |                                                                                   |      |
| cM capacity (veh/h)               | 64                                                                                | 595                                                                               | 396                                                                               |                                                                                   |                                                                                   |                                                                                   |      |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | NB 2                                                                              | NB 3                                                                              | SB 1                                                                              | SB 2                                                                              | SB 3 |
| Volume Total                      | 9                                                                                 | 86                                                                                | 789                                                                               | 789                                                                               | 847                                                                               | 847                                                                               | 8    |
| Volume Left                       | 0                                                                                 | 86                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    |
| Volume Right                      | 9                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 8    |
| cSH                               | 595                                                                               | 396                                                                               | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700 |
| Volume to Capacity                | 0.02                                                                              | 0.22                                                                              | 0.46                                                                              | 0.46                                                                              | 0.50                                                                              | 0.50                                                                              | 0.00 |
| Queue Length 95th (ft)            | 1                                                                                 | 20                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    |
| Control Delay (s)                 | 11.1                                                                              | 16.6                                                                              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0  |
| Lane LOS                          | B                                                                                 | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Approach Delay (s)                | 11.1                                                                              | 0.9                                                                               |                                                                                   |                                                                                   | 0.0                                                                               |                                                                                   |      |
| Approach LOS                      | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |
| Average Delay                     |                                                                                   |                                                                                   | 0.5                                                                               |                                                                                   |                                                                                   |                                                                                   |      |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 50.5%                                                                             |                                                                                   | ICU Level of Service                                                              |                                                                                   | A    |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |      |

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# HCM Unsignalized Intersection Capacity Analysis 7: Los Volcanes Rd & "A"

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |      |      |       |                      |      |      |
|-----------------------------------|------|------|-------|----------------------|------|------|
|                                   | →    | ↘    | ↙     | ←                    | ↖    | ↗    |
| Movement                          | EBT  | EBR  | WBL   | WBT                  | NBL  | NBR  |
| Lane Configurations               | ↑    |      |       | ↑                    | ↘    |      |
| Volume (veh/h)                    | 339  | 5    | 37    | 280                  | 19   | 5    |
| Sign Control                      | Free |      |       | Free                 | Stop |      |
| Grade                             | 0%   |      |       | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.85 | 0.85 | 0.85  | 0.85                 | 0.85 | 0.85 |
| Hourly flow rate (vph)            | 399  | 6    | 44    | 329                  | 22   | 6    |
| Pedestrians                       |      |      |       |                      |      |      |
| Lane Width (ft)                   |      |      |       |                      |      |      |
| Walking Speed (ft/s)              |      |      |       |                      |      |      |
| Percent Blockage                  |      |      |       |                      |      |      |
| Right turn flare (veh)            |      |      |       |                      |      |      |
| Median type                       | None |      |       | None                 |      |      |
| Median storage veh                |      |      |       |                      |      |      |
| Upstream signal (ft)              |      |      |       | 648                  |      |      |
| pX, platoon unblocked             |      |      |       |                      |      |      |
| vC, conflicting volume            |      |      | 405   |                      | 818  | 402  |
| vC1, stage 1 conf vol             |      |      |       |                      |      |      |
| vC2, stage 2 conf vol             |      |      |       |                      |      |      |
| vCu, unblocked vol                |      |      | 405   |                      | 818  | 402  |
| tC, single (s)                    |      |      | 4.1   |                      | 6.4  | 6.2  |
| tC, 2 stage (s)                   |      |      |       |                      |      |      |
| tF (s)                            |      |      | 2.2   |                      | 3.5  | 3.3  |
| p0 queue free %                   |      |      | 96    |                      | 93   | 99   |
| cM capacity (veh/h)               |      |      | 1149  |                      | 331  | 646  |
| Direction, Lane #                 | EB 1 | WB 1 | NB 1  |                      |      |      |
| Volume Total                      | 405  | 373  | 28    |                      |      |      |
| Volume Left                       | 0    | 44   | 22    |                      |      |      |
| Volume Right                      | 6    | 0    | 6     |                      |      |      |
| cSH                               | 1700 | 1149 | 369   |                      |      |      |
| Volume to Capacity                | 0.24 | 0.04 | 0.08  |                      |      |      |
| Queue Length 95th (ft)            | 0    | 3    | 6     |                      |      |      |
| Control Delay (s)                 | 0.0  | 1.3  | 15.6  |                      |      |      |
| Lane LOS                          |      | A    | C     |                      |      |      |
| Approach Delay (s)                | 0.0  | 1.3  | 15.6  |                      |      |      |
| Approach LOS                      |      |      | C     |                      |      |      |
| Intersection Summary              |      |      |       |                      |      |      |
| Average Delay                     |      |      | 1.2   |                      |      |      |
| Intersection Capacity Utilization |      |      | 48.3% | ICU Level of Service | A    |      |
| Analysis Period (min)             |      |      | 15    |                      |      |      |

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# HCM Unsignalized Intersection Capacity Analysis 7: Los Volcanes Rd & "A"

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                   |  |  |  |  |  |  |
| Movement                          | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | NBL                                                                               | NBR                                                                               |
| Lane Configurations               |  |                                                                                   |                                                                                   |  |  |                                                                                   |
| Volume (veh/h)                    | 176                                                                               | 5                                                                                 | 46                                                                                | 170                                                                               | 20                                                                                | 5                                                                                 |
| Sign Control                      | Free                                                                              |                                                                                   |                                                                                   | Free                                                                              | Stop                                                                              |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                | 0%                                                                                |                                                                                   |
| Peak Hour Factor                  | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              |
| Hourly flow rate (vph)            | 207                                                                               | 6                                                                                 | 54                                                                                | 200                                                                               | 24                                                                                | 6                                                                                 |
| Pedestrians                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Lane Width (ft)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Walking Speed (ft/s)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Percent Blockage                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median type                       | None                                                                              |                                                                                   |                                                                                   | None                                                                              |                                                                                   |                                                                                   |
| Median storage (veh)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   | 648                                                                               |                                                                                   |                                                                                   |
| pX, platoon unblocked             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC, conflicting volume            |                                                                                   |                                                                                   | 213                                                                               |                                                                                   | 518                                                                               | 210                                                                               |
| vC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vCu, unblocked vol                |                                                                                   |                                                                                   | 213                                                                               |                                                                                   | 518                                                                               | 210                                                                               |
| tC, single (s)                    |                                                                                   |                                                                                   | 4.1                                                                               |                                                                                   | 6.4                                                                               | 6.2                                                                               |
| tC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| tF (s)                            |                                                                                   |                                                                                   | 2.2                                                                               |                                                                                   | 3.5                                                                               | 3.3                                                                               |
| p0 queue free %                   |                                                                                   |                                                                                   | 96                                                                                |                                                                                   | 95                                                                                | 99                                                                                |
| cM capacity (veh/h)               |                                                                                   |                                                                                   | 1351                                                                              |                                                                                   | 495                                                                               | 828                                                                               |
| Direction, Lane #                 | EB 1                                                                              | WB 1                                                                              | NB 1                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Volume Total                      | 213                                                                               | 254                                                                               | 29                                                                                |                                                                                   |                                                                                   |                                                                                   |
| Volume Left                       | 0                                                                                 | 54                                                                                | 24                                                                                |                                                                                   |                                                                                   |                                                                                   |
| Volume Right                      | 6                                                                                 | 0                                                                                 | 6                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| cSH                               | 1700                                                                              | 1351                                                                              | 538                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Volume to Capacity                | 0.13                                                                              | 0.04                                                                              | 0.05                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Queue Length 95th (ft)            | 0                                                                                 | 3                                                                                 | 4                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Control Delay (s)                 | 0.0                                                                               | 1.9                                                                               | 12.1                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Lane LOS                          |                                                                                   | A                                                                                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Approach Delay (s)                | 0.0                                                                               | 1.9                                                                               | 12.1                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Approach LOS                      |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Average Delay                     |                                                                                   |                                                                                   | 1.7                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 34.4%                                                                             | ICU Level of Service                                                              | A                                                                                 |                                                                                   |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |

# HCM Unsignalized Intersection Capacity Analysis 8: Los Volcanes Rd & "B"

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |      |      |       |                      |      |      |
|-----------------------------------|------|------|-------|----------------------|------|------|
|                                   | →    | ↘    | ↙     | ←                    | ↖    | ↗    |
| Movement                          | EBT  | EBR  | WBL   | WBT                  | NBL  | NBR  |
| Lane Configurations               | ↑    |      |       | ↑                    |      | ↗    |
| Volume (veh/h)                    | 325  | 14   | 0     | 317                  | 0    | 37   |
| Sign Control                      | Free |      |       | Free                 | Stop |      |
| Grade                             | 0%   |      |       | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.85 | 0.85 | 0.85  | 0.85                 | 0.85 | 0.85 |
| Hourly flow rate (vph)            | 382  | 16   | 0     | 373                  | 0    | 44   |
| Pedestrians                       |      |      |       |                      |      |      |
| Lane Width (ft)                   |      |      |       |                      |      |      |
| Walking Speed (ft/s)              |      |      |       |                      |      |      |
| Percent Blockage                  |      |      |       |                      |      |      |
| Right turn flare (veh)            |      |      |       |                      |      |      |
| Median type                       | None |      |       | None                 |      |      |
| Median storage veh                |      |      |       |                      |      |      |
| Upstream signal (ft)              |      |      |       | 387                  |      |      |
| pX, platoon unblocked             |      |      |       |                      | 0.99 |      |
| vC, conflicting volume            |      |      | 399   |                      | 764  | 391  |
| vC1, stage 1 conf vol             |      |      |       |                      |      |      |
| vC2, stage 2 conf vol             |      |      |       |                      |      |      |
| vCu, unblocked vol                |      |      | 399   |                      | 754  | 391  |
| tC, single (s)                    |      |      | 4.1   |                      | 6.4  | 6.2  |
| tC, 2 stage (s)                   |      |      |       |                      |      |      |
| tF (s)                            |      |      | 2.2   |                      | 3.5  | 3.3  |
| p0 queue free %                   |      |      | 100   |                      | 100  | 93   |
| cM capacity (veh/h)               |      |      | 1154  |                      | 371  | 656  |
| Direction, Lane #                 | EB 1 | WB 1 | NB 1  |                      |      |      |
| Volume Total                      | 399  | 373  | 44    |                      |      |      |
| Volume Left                       | 0    | 0    | 0     |                      |      |      |
| Volume Right                      | 16   | 0    | 44    |                      |      |      |
| cSH                               | 1700 | 1700 | 656   |                      |      |      |
| Volume to Capacity                | 0.23 | 0.22 | 0.07  |                      |      |      |
| Queue Length 95th (ft)            | 0    | 0    | 5     |                      |      |      |
| Control Delay (s)                 | 0.0  | 0.0  | 10.9  |                      |      |      |
| Lane LOS                          |      |      | B     |                      |      |      |
| Approach Delay (s)                | 0.0  | 0.0  | 10.9  |                      |      |      |
| Approach LOS                      |      |      | B     |                      |      |      |
| Intersection Summary              |      |      |       |                      |      |      |
| Average Delay                     |      |      | 0.6   |                      |      |      |
| Intersection Capacity Utilization |      |      | 28.0% | ICU Level of Service | A    |      |
| Analysis Period (min)             |      |      | 15    |                      |      |      |

2012 AM Peak BUILD Conditions

Existing Geometry  
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# HCM Unsignalized Intersection Capacity Analysis 8: Los Volcanes Rd & "B"

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |      |       |      |                      |      |      |
|-----------------------------------|------|-------|------|----------------------|------|------|
|                                   | →    | ↘     | ↙    | ←                    | ↖    | ↗    |
| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
| Lane Configurations               | ↗    |       |      | ↖                    |      | ↗    |
| Volume (veh/h)                    | 161  | 15    | 0    | 216                  | 0    | 57   |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.85 | 0.85  | 0.85 | 0.85                 | 0.85 | 0.85 |
| Hourly flow rate (vph)            | 189  | 18    | 0    | 254                  | 0    | 67   |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (ft)                   |      |       |      |                      |      |      |
| Walking Speed (ft/s)              |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage (veh)              |      |       |      |                      |      |      |
| Upstream signal (ft)              |      |       |      | 387                  |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      |       | 207  |                      | 452  | 198  |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      |       | 207  |                      | 452  | 198  |
| tC, single (s)                    |      |       | 4.1  |                      | 6.4  | 6.2  |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      |       | 2.2  |                      | 3.5  | 3.3  |
| p0 queue free %                   |      |       | 100  |                      | 100  | 92   |
| cM capacity (veh/h)               |      |       | 1358 |                      | 563  | 840  |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1 |                      |      |      |
| Volume Total                      | 207  | 254   | 67   |                      |      |      |
| Volume Left                       | 0    | 0     | 0    |                      |      |      |
| Volume Right                      | 18   | 0     | 67   |                      |      |      |
| cSH                               | 1700 | 1700  | 840  |                      |      |      |
| Volume to Capacity                | 0.12 | 0.15  | 0.08 |                      |      |      |
| Queue Length 95th (ft)            | 0    | 0     | 6    |                      |      |      |
| Control Delay (s)                 | 0.0  | 0.0   | 9.7  |                      |      |      |
| Lane LOS                          |      |       | A    |                      |      |      |
| Approach Delay (s)                | 0.0  | 0.0   | 9.7  |                      |      |      |
| Approach LOS                      |      |       | A    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 1.2   |      |                      |      |      |
| Intersection Capacity Utilization |      | 19.6% |      | ICU Level of Service | A    |      |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis 9: "C" & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |  |  |  |  |  |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBR                                                                               | NBL                                                                               | NBT                                                                               | SBT                                                                               | SBR                                                                               |
| Lane Configurations               |                                                                                   |  |                                                                                   |  |  |  |
| Volume (veh/h)                    | 0                                                                                 | 41                                                                                | 0                                                                                 | 1445                                                                              | 1729                                                                              | 5                                                                                 |
| Sign Control                      | Stop                                                                              |                                                                                   |                                                                                   | Free                                                                              | Free                                                                              |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                | 0%                                                                                |                                                                                   |
| Peak Hour Factor                  | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              |
| Hourly flow rate (vph)            | 0                                                                                 | 48                                                                                | 0                                                                                 | 1700                                                                              | 2034                                                                              | 6                                                                                 |
| Pedestrians                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Lane Width (ft)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Walking Speed (ft/s)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Percent Blockage                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median type                       |                                                                                   |                                                                                   |                                                                                   | None                                                                              | None                                                                              |                                                                                   |
| Median storage veh                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   | 1282                                                                              | 440                                                                               |                                                                                   |
| pX, platoon unblocked             | 0.69                                                                              | 0.52                                                                              | 0.52                                                                              |                                                                                   |                                                                                   |                                                                                   |
| vC, conflicting volume            | 2884                                                                              | 1017                                                                              | 2040                                                                              |                                                                                   |                                                                                   |                                                                                   |
| vC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vCu, unblocked vol                | 529                                                                               | 0                                                                                 | 1142                                                                              |                                                                                   |                                                                                   |                                                                                   |
| tC, single (s)                    | 6.9                                                                               | 7.0                                                                               | 4.2                                                                               |                                                                                   |                                                                                   |                                                                                   |
| tC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| tF (s)                            | 3.5                                                                               | 3.3                                                                               | 2.2                                                                               |                                                                                   |                                                                                   |                                                                                   |
| p0 queue free %                   | 100                                                                               | 91                                                                                | 100                                                                               |                                                                                   |                                                                                   |                                                                                   |
| cM capacity (veh/h)               | 331                                                                               | 559                                                                               | 311                                                                               |                                                                                   |                                                                                   |                                                                                   |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | NB 2                                                                              | SB 1                                                                              | SB 2                                                                              | SB 3                                                                              |
| Volume Total                      | 48                                                                                | 850                                                                               | 850                                                                               | 1017                                                                              | 1017                                                                              | 6                                                                                 |
| Volume Left                       | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Volume Right                      | 48                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 6                                                                                 |
| cSH                               | 559                                                                               | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              | 1700                                                                              |
| Volume to Capacity                | 0.09                                                                              | 0.50                                                                              | 0.50                                                                              | 0.60                                                                              | 0.60                                                                              | 0.00                                                                              |
| Queue Length 95th (ft)            | 7                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 |
| Control Delay (s)                 | 12.1                                                                              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |
| Lane LOS                          | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Approach Delay (s)                | 12.1                                                                              | 0.0                                                                               |                                                                                   | 0.0                                                                               |                                                                                   |                                                                                   |
| Approach LOS                      | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Average Delay                     |                                                                                   | 0.2                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   | 57.8%                                                                             |                                                                                   | ICU Level of Service                                                              |                                                                                   | B                                                                                 |
| Analysis Period (min)             |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |

2012 AM Peak BUILD Conditions

Existing Geometry  
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# HCM Unsignalized Intersection Capacity Analysis 9: "C" & Unser Blvd

Terry O. Brown, P.E.  
12/29/2010 - Synchro 7

|                                   |  |  |  |                                                                                    |                                                                                    |  |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Movement                          | EBL                                                                               | EBR                                                                               | NBL                                                                               | NBT                                                                                                                                                                 | SBT                                                                                                                                                                 | SBR                                                                               |
| Lane Configurations               |                                                                                   |  |                                                                                   |   |   |  |
| Volume (veh/h)                    | 0                                                                                 | 52                                                                                | 0                                                                                 | 1344                                                                                                                                                                | 1372                                                                                                                                                                | 4                                                                                 |
| Sign Control                      | Stop                                                                              |                                                                                   |                                                                                   | Free                                                                                                                                                                | Free                                                                                                                                                                |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                                                                                                  | 0%                                                                                                                                                                  |                                                                                   |
| Peak Hour Factor                  | 0.85                                                                              | 0.85                                                                              | 0.85                                                                              | 0.85                                                                                                                                                                | 0.85                                                                                                                                                                | 0.85                                                                              |
| Hourly flow rate (vph)            | 0                                                                                 | 61                                                                                | 0                                                                                 | 1581                                                                                                                                                                | 1614                                                                                                                                                                | 5                                                                                 |
| Pedestrians                       |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| Lane Width (ft)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| Walking Speed (ft/s)              |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| Percent Blockage                  |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| Median type                       |                                                                                   |                                                                                   |                                                                                   | None                                                                                                                                                                | None                                                                                                                                                                |                                                                                   |
| Median storage (veh)              |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   | 1282                                                                                                                                                                | 440                                                                                                                                                                 |                                                                                   |
| pX, platoon unblocked             | 0.87                                                                              | 0.78                                                                              | 0.78                                                                              |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| vC, conflicting volume            | 2405                                                                              | 807                                                                               | 1619                                                                              |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| vC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| vC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| vCu, unblocked vol                | 1384                                                                              | 197                                                                               | 1235                                                                              |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| tC, single (s)                    | 6.9                                                                               | 7.0                                                                               | 4.2                                                                               |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| tC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| tF (s)                            | 3.5                                                                               | 3.3                                                                               | 2.2                                                                               |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| p0 queue free %                   | 100                                                                               | 90                                                                                | 100                                                                               |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| cM capacity (veh/h)               | 116                                                                               | 632                                                                               | 434                                                                               |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| Direction, Lane #                 | EB 1                                                                              | NB 1                                                                              | NB 2                                                                              | SB 1                                                                                                                                                                | SB 2                                                                                                                                                                | SB 3                                                                              |
| Volume Total                      | 61                                                                                | 791                                                                               | 791                                                                               | 807                                                                                                                                                                 | 807                                                                                                                                                                 | 5                                                                                 |
| Volume Left                       | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                                                                                                   | 0                                                                                                                                                                   | 0                                                                                 |
| Volume Right                      | 61                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                                                                                                   | 0                                                                                                                                                                   | 5                                                                                 |
| cSH                               | 632                                                                               | 1700                                                                              | 1700                                                                              | 1700                                                                                                                                                                | 1700                                                                                                                                                                | 1700                                                                              |
| Volume to Capacity                | 0.10                                                                              | 0.47                                                                              | 0.47                                                                              | 0.47                                                                                                                                                                | 0.47                                                                                                                                                                | 0.00                                                                              |
| Queue Length 95th (ft)            | 8                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                                                                                                   | 0                                                                                                                                                                   | 0                                                                                 |
| Control Delay (s)                 | 11.3                                                                              | 0.0                                                                               | 0.0                                                                               | 0.0                                                                                                                                                                 | 0.0                                                                                                                                                                 | 0.0                                                                               |
| Lane LOS                          | B                                                                                 |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| Approach Delay (s)                | 11.3                                                                              | 0.0                                                                               |                                                                                   | 0.0                                                                                                                                                                 |                                                                                                                                                                     |                                                                                   |
| Approach LOS                      | B                                                                                 |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| Average Delay                     |                                                                                   |                                                                                   | 0.2                                                                               |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   | 47.9%                                                                             | ICU Level of Service                                                                                                                                                |                                                                                                                                                                     | A                                                                                 |
| Analysis Period (min)             |                                                                                   |                                                                                   | 15                                                                                |                                                                                                                                                                     |                                                                                                                                                                     |                                                                                   |

# Traffic Count Data Sheet

|                    |  |      |                                                                |  |                                 |  |
|--------------------|--|------|----------------------------------------------------------------|--|---------------------------------|--|
| Year Counts Taken: |  | 2010 | Volero Commercial Development (Los Volcanes Rd. / Unser Blvd.) |  |                                 |  |
|                    |  |      | E-W Street Los Volcanes Rd.                                    |  | Speed Limit (Los Volcanes Rd.)= |  |
|                    |  |      | N-S Street: Unser Blvd.                                        |  | Speed Limit (Unser Blvd.)=      |  |
|                    |  |      | SIGNALIZED                                                     |  | Date of Count:                  |  |
|                    |  |      |                                                                |  | 10/6/10                         |  |

| Begin Time                  | End Time | Eastbound (Los Volcanes Rd.) |            |           | Westbound (Los Volcanes Rd.) |           |            | Northbound (Unser Blvd.) |             |            | Southbound (Unser Blvd.) |             |            |
|-----------------------------|----------|------------------------------|------------|-----------|------------------------------|-----------|------------|--------------------------|-------------|------------|--------------------------|-------------|------------|
|                             |          | L                            | T          | R         | L                            | T         | R          | L                        | T           | R          | L                        | T           | R          |
| 7:00 AM                     | 7:15 AM  | 55                           | 42         | 2         | 22                           | 9         | 33         | 9                        | 304         | 66         | 59                       | 486         | 47         |
| 7:15 AM                     | 7:30 AM  | 54                           | 44         | 4         | 20                           | 40        | 29         | 5                        | 325         | 64         | 62                       | 496         | 44         |
| 7:30 AM                     | 7:45 AM  | 57                           | 23         | 1         | 28                           | 11        | 36         | 2                        | 325         | 31         | 59                       | 266         | 19         |
| 7:45 AM                     | 8:00 AM  | 43                           | 33         | 2         | 11                           | 3         | 38         | 4                        | 316         | 28         | 119                      | 422         | 52         |
| 8:00 AM                     | 8:15 AM  | 33                           | 33         | 4         | 11                           | 8         | 39         | 10                       | 274         | 22         | 103                      | 438         | 81         |
| 8:15 AM                     | 8:30 AM  | 39                           | 30         | 4         | 8                            | 7         | 23         | 7                        | 241         | 34         | 124                      | 385         | 56         |
| 8:30 AM                     | 8:45 AM  | 27                           | 8          | 2         | 5                            | 2         | 36         | 2                        | 244         | 46         | 68                       | 237         | 25         |
| 8:45 AM                     | 9:00 AM  | 39                           | 7          | 4         | 5                            | 3         | 28         | 2                        | 260         | 46         | 37                       | 469         | 9          |
| <b>AM Peak Hour Volumes</b> |          | <b>172</b>                   | <b>119</b> | <b>11</b> | <b>58</b>                    | <b>29</b> | <b>136</b> | <b>23</b>                | <b>1156</b> | <b>115</b> | <b>405</b>               | <b>1511</b> | <b>208</b> |
| % of Total Traffic          |          | 4.4%                         | 3.0%       | 0.3%      | 1.5%                         | 0.7%      | 3.4%       | 0.6%                     | 29.3%       | 2.9%       | 10.3%                    | 38.3%       | 5.3%       |
| % Directional               |          |                              | 7.7%       |           |                              | 5.7%      |            |                          | 32.8%       |            |                          | 53.9%       |            |
| AM Peak Hour Factor         |          |                              | 0.93       |           |                              | 0.74      |            |                          | 0.90        |            |                          | 0.85        |            |

| Begin Time                  | End Time | Eastbound (Los Volcanes Rd.) |           |           | Westbound (Los Volcanes Rd.) |           |            | Northbound (Unser Blvd.) |             |           | Southbound (Unser Blvd.) |             |            |
|-----------------------------|----------|------------------------------|-----------|-----------|------------------------------|-----------|------------|--------------------------|-------------|-----------|--------------------------|-------------|------------|
|                             |          | L                            | T         | R         | L                            | T         | R          | L                        | T           | R         | L                        | T           | R          |
| 4:00 PM                     | 4:15 PM  | 49                           | 7         | 4         | 46                           | 5         | 47         | 5                        | 497         | 45        | 42                       | 294         | 49         |
| 4:15 PM                     | 4:30 PM  | 25                           | 7         | 3         | 44                           | 3         | 39         | 5                        | 494         | 8         | 35                       | 288         | 22         |
| 4:30 PM                     | 4:45 PM  | 48                           | 3         | 4         | 45                           | 6         | 35         | 3                        | 234         | 9         | 39                       | 289         | 26         |
| 4:45 PM                     | 5:00 PM  | 24                           | 7         | 5         | 14                           | 7         | 58         | 2                        | 236         | 11        | 44                       | 312         | 25         |
| 5:00 PM                     | 5:15 PM  | 21                           | 6         | 4         | 18                           | 3         | 49         | 4                        | 242         | 25        | 32                       | 268         | 34         |
| 5:15 PM                     | 5:30 PM  | 31                           | 2         | 3         | 17                           | 5         | 55         | 2                        | 287         | 25        | 36                       | 306         | 21         |
| 5:30 PM                     | 5:45 PM  | 20                           | 1         | 4         | 19                           | 5         | 47         | 2                        | 280         | 22        | 29                       | 261         | 28         |
| 5:45 PM                     | 6:00 PM  | 20                           | 2         | 5         | 43                           | 5         | 32         | 6                        | 264         | 45        | 45                       | 276         | 39         |
| <b>PM Peak Hour Volumes</b> |          | <b>96</b>                    | <b>16</b> | <b>16</b> | <b>68</b>                    | <b>20</b> | <b>209</b> | <b>10</b>                | <b>1045</b> | <b>83</b> | <b>141</b>               | <b>1147</b> | <b>108</b> |
| % of Total Traffic          |          | 3.2%                         | 0.5%      | 0.5%      | 2.3%                         | 0.7%      | 7.1%       | 0.3%                     | 35.3%       | 2.8%      | 4.8%                     | 38.8%       | 3.6%       |
| % Directional               |          |                              | 4.3%      |           |                              | 10.0%     |            |                          | 38.5%       |           |                          | 47.2%       |            |
| PM Peak Hour Factor         |          |                              | 0.89      |           |                              | 0.94      |            |                          | 0.91        |           |                          | 0.92        |            |

# Traffic Count Data Sheet

Year Counts Taken: 2010 E-W Street Bluewater Rd Speed Limit (Bluewater Rd)= 25 MPH  
 N-S Street: Unser Blvd Speed Limit (Unser Blvd)= 25 MPH  
 Date of Count: 10/12/2010

| Begin Time                  | End Time | Eastbound (Bluewater Rd) |           |           | Westbound (Bluewater Rd) |           |           | Northbound (Unser Blvd) |             |           | Southbound (Unser Blvd) |            |           |
|-----------------------------|----------|--------------------------|-----------|-----------|--------------------------|-----------|-----------|-------------------------|-------------|-----------|-------------------------|------------|-----------|
|                             |          | L                        | T         | R         | L                        | T         | R         | L                       | T           | R         | L                       | T          | R         |
| 7:00 AM                     | 7:15 AM  | 47                       | 20        | 10        | 7                        | 5         | 6         | 8                       | 327         | 24        | 32                      | 138        | 16        |
| 7:15 AM                     | 7:30 AM  | 45                       | 15        | 12        | 9                        | 13        | 13        | 5                       | 353         | 20        | 35                      | 199        | 15        |
| 7:30 AM                     | 7:45 AM  | 48                       | 16        | 22        | 20                       | 9         | 20        | 18                      | 300         | 18        | 30                      | 180        | 26        |
| 7:45 AM                     | 8:00 AM  | 37                       | 28        | 37        | 9                        | 19        | 13        | 39                      | 253         | 27        | 51                      | 187        | 40        |
| 8:00 AM                     | 8:15 AM  | 60                       | 48        | 40        | 6                        | 14        | 16        | 35                      | 204         | 9         | 35                      | 427        | 23        |
| 8:15 AM                     | 8:30 AM  | 30                       | 6         | 15        | 43                       | 7         | 12        | 8                       | 195         | 14        | 25                      | 426        | 8         |
| 8:30 AM                     | 8:45 AM  | 35                       | 4         | 11        | 5                        | 3         | 12        | 6                       | 228         | 7         | 20                      | 427        | 8         |
| 8:45 AM                     | 9:00 AM  | 0                        | 0         | 0         | 0                        | 0         | 0         | 0                       | 0           | 0         | 0                       | 0          | 0         |
| <b>AM Peak Hour Volumes</b> |          | <b>177</b>               | <b>79</b> | <b>81</b> | <b>45</b>                | <b>46</b> | <b>52</b> | <b>70</b>               | <b>1233</b> | <b>89</b> | <b>148</b>              | <b>704</b> | <b>97</b> |
| % of Total Traffic          |          | 6.3%                     | 2.8%      | 2.9%      | 1.6%                     | 1.6%      | 1.8%      | 2.5%                    | 43.7%       | 3.2%      | 5.2%                    | 25.0%      | 3.4%      |
| % Directional               |          |                          | 11.9%     |           |                          | 5.1%      |           |                         | 49.3%       |           |                         | 33.6%      |           |
| AM Peak Hour Factor         |          |                          | 0.83      |           |                          | 0.73      |           |                         | 0.92        |           |                         | 0.85       |           |

| Begin Time                  | End Time | Eastbound (Bluewater Rd) |           |           | Westbound (Bluewater Rd) |           |            | Northbound (Unser Blvd) |            |           | Southbound (Unser Blvd) |             |            |
|-----------------------------|----------|--------------------------|-----------|-----------|--------------------------|-----------|------------|-------------------------|------------|-----------|-------------------------|-------------|------------|
|                             |          | L                        | T         | R         | L                        | T         | R          | L                       | T          | R         | L                       | T           | R          |
| 4:00 PM                     | 4:15 PM  | 45                       | 6         | 11        | 49                       | 15        | 28         | 43                      | 171        | 8         | 43                      | 237         | 32         |
| 4:15 PM                     | 4:30 PM  | 44                       | 10        | 13        | 41                       | 10        | 24         | 49                      | 158        | 5         | 47                      | 266         | 34         |
| 4:30 PM                     | 4:45 PM  | 25                       | 5         | 9         | 26                       | 20        | 50         | 13                      | 204        | 5         | 19                      | 255         | 28         |
| 4:45 PM                     | 5:00 PM  | 23                       | 18        | 15        | 19                       | 24        | 37         | 19                      | 205        | 9         | 26                      | 295         | 36         |
| 5:00 PM                     | 5:15 PM  | 27                       | 16        | 23        | 21                       | 19        | 56         | 23                      | 225        | 4         | 21                      | 257         | 33         |
| 5:15 PM                     | 5:30 PM  | 22                       | 14        | 10        | 25                       | 26        | 40         | 8                       | 231        | 10        | 19                      | 293         | 27         |
| 5:30 PM                     | 5:45 PM  | 32                       | 15        | 2         | 21                       | 13        | 33         | 15                      | 198        | 11        | 42                      | 226         | 47         |
| 5:45 PM                     | 6:00 PM  | 0                        | 0         | 0         | 0                        | 0         | 0          | 0                       | 0          | 0         | 0                       | 0           | 0          |
| <b>PM Peak Hour Volumes</b> |          | <b>97</b>                | <b>53</b> | <b>57</b> | <b>91</b>                | <b>89</b> | <b>183</b> | <b>63</b>               | <b>865</b> | <b>28</b> | <b>85</b>               | <b>1100</b> | <b>124</b> |
| % of Total Traffic          |          | 3.4%                     | 1.9%      | 2.0%      | 3.2%                     | 3.1%      | 6.5%       | 2.2%                    | 30.5%      | 1.0%      | 3.0%                    | 38.8%       | 4.4%       |
| % Directional               |          |                          | 7.3%      |           |                          | 12.8%     |            |                         | 33.7%      |           |                         | 46.2%       |            |
| PM Peak Hour Factor         |          |                          | 0.78      |           |                          | 0.95      |            |                         | 0.95       |           |                         | 0.92        |            |

# Traffic Count Data Sheet

|                    |  |      |                                                 |  |                             |          |
|--------------------|--|------|-------------------------------------------------|--|-----------------------------|----------|
| Year Counts Taken: |  | 2010 | Valero Station (Los Volcanes Rd. / Unser Blvd.) |  |                             |          |
|                    |  |      | E-W Street I-40 N. Ramp                         |  | Speed Limit (I-40 N. Ramp)= | 45 MPH   |
|                    |  |      | N-S Street: Unser Blvd.                         |  | Speed Limit (Unser Blvd.)=  | 45 MPH   |
|                    |  |      | Signalized                                      |  | Date of Count:              | 10/13/10 |

| Begin Time                  | End Time | Eastbound (I-40 N. Ramp) |      |      | Westbound (I-40 N. Ramp) |       |      | Northbound (Unser Blvd.) |       |      | Southbound (Unser Blvd.) |       |      |
|-----------------------------|----------|--------------------------|------|------|--------------------------|-------|------|--------------------------|-------|------|--------------------------|-------|------|
|                             |          | L                        | T    | R    | L                        | T     | R*   | L                        | T     | R    | L                        | T     | R*   |
| 7:00 AM                     | 7:15 AM  | 0                        | 0    | 0    | 85                       | 0     | 0    | 7                        | 116   | 0    | 0                        | 521   | 0    |
| 7:15 AM                     | 7:30 AM  | 0                        | 0    | 0    | 89                       | 0     | 0    | 7                        | 133   | 0    | 0                        | 627   | 0    |
| 7:30 AM                     | 7:45 AM  | 0                        | 0    | 0    | 93                       | 0     | 0    | 8                        | 177   | 0    | 0                        | 564   | 0    |
| 7:45 AM                     | 8:00 AM  | 0                        | 0    | 0    | 109                      | 0     | 0    | 11                       | 176   | 0    | 0                        | 510   | 0    |
| 8:00 AM                     | 8:15 AM  | 0                        | 0    | 0    | 95                       | 0     | 0    | 3                        | 127   | 0    | 0                        | 364   | 0    |
| 8:15 AM                     | 8:30 AM  | 0                        | 0    | 0    | 100                      | 0     | 0    | 7                        | 119   | 0    | 0                        | 380   | 0    |
| 8:30 AM                     | 8:45 AM  | 0                        | 0    | 0    | 62                       | 0     | 0    | 8                        | 127   | 0    | 0                        | 332   | 0    |
| 8:45 AM                     | 9:00 AM  | 0                        | 0    | 0    | 74                       | 0     | 0    | 8                        | 140   | 0    | 0                        | 340   | 0    |
| <b>AM Peak Hour Volumes</b> |          | 0                        | 0    | 0    | 376                      | 0     | 0    | 33                       | 602   | 0    | 0                        | 2222  | 0    |
| % of Total Traffic          |          | 0.0%                     | 0.0% | 0.0% | 11.6%                    | 0.0%  | 0.0% | 1.0%                     | 18.6% | 0.0% | 0.0%                     | 68.7% | 0.0% |
| % Directional               |          |                          |      |      |                          | 11.6% |      |                          | 19.6% |      |                          | 68.7% |      |
| AM Peak Hour Factor         |          |                          |      |      |                          | 0.86  |      |                          | 0.85  |      |                          | 0.89  |      |

| Begin Time                  | End Time | Eastbound (I-40 N. Ramp) |      |      | Westbound (I-40 N. Ramp) |       |      | Northbound (Unser Blvd.) |       |      | Southbound (Unser Blvd.) |       |      |
|-----------------------------|----------|--------------------------|------|------|--------------------------|-------|------|--------------------------|-------|------|--------------------------|-------|------|
|                             |          | L                        | T    | R    | L                        | T     | R*   | L                        | T     | R    | L                        | T     | R*   |
| 4:00 PM                     | 4:15 PM  | 0                        | 1    | 0    | 247                      | 1     | 0    | 5                        | 210   | 0    | 0                        | 190   | 0    |
| 4:15 PM                     | 4:30 PM  | 0                        | 0    | 0    | 236                      | 2     | 0    | 5                        | 205   | 0    | 0                        | 193   | 0    |
| 4:30 PM                     | 4:45 PM  | 0                        | 0    | 0    | 276                      | 1     | 0    | 8                        | 189   | 0    | 0                        | 185   | 0    |
| 4:45 PM                     | 5:00 PM  | 0                        | 0    | 0    | 252                      | 1     | 0    | 6                        | 202   | 0    | 0                        | 216   | 0    |
| 5:00 PM                     | 5:15 PM  | 0                        | 0    | 0    | 197                      | 0     | 0    | 7                        | 286   | 0    | 0                        | 220   | 0    |
| 5:15 PM                     | 5:30 PM  | 0                        | 0    | 0    | 196                      | 1     | 0    | 2                        | 238   | 0    | 0                        | 258   | 0    |
| 5:30 PM                     | 5:45 PM  | 0                        | 0    | 0    | 211                      | 2     | 0    | 5                        | 191   | 0    | 0                        | 245   | 0    |
| 5:45 PM                     | 6:00 PM  | 0                        | 0    | 0    | 202                      | 5     | 0    | 4                        | 201   | 0    | 0                        | 239   | 0    |
| <b>PM Peak Hour Volumes</b> |          | 0                        | 0    | 0    | 921                      | 3     | 0    | 23                       | 915   | 0    | 0                        | 879   | 0    |
| % of Total Traffic          |          | 0.0%                     | 0.0% | 0.0% | 33.6%                    | 0.1%  | 0.0% | 0.8%                     | 33.4% | 0.0% | 0.0%                     | 32.1% | 0.0% |
| % Directional               |          |                          |      |      |                          | 33.7% |      |                          | 34.2% |      |                          | 32.1% |      |
| PM Peak Hour Factor         |          |                          |      |      |                          | 0.83  |      |                          | 0.80  |      |                          | 0.85  |      |

NOTE: Westbound right turn and southbound right turn movements are a free right turn ramps that by-passes the signal.

# Traffic Count Data Sheet

|                    |  |      |                                                 |                                    |
|--------------------|--|------|-------------------------------------------------|------------------------------------|
| Year Counts Taken: |  | 2010 | Valero Station (Los Volcanes Rd. / Unser Blvd.) |                                    |
|                    |  |      | E-W Street I-40 S. Ramp                         | Speed Limit (I-40 S. Ramp)= 45 MPH |
|                    |  |      | N-S Street: Unser Blvd.                         | Speed Limit (Unser Blvd.)= 45 MPH  |
|                    |  |      | UN SIGNALIZED                                   | Date of Count: 10/14/10            |

| Begin Time                  | End Time | Eastbound (I-40 S. Ramp) |             |           | Westbound (I-40 S. Ramp) |          |          | Northbound (Unser Blvd.) |             |          | Southbound (Unser Blvd.) |             |          |
|-----------------------------|----------|--------------------------|-------------|-----------|--------------------------|----------|----------|--------------------------|-------------|----------|--------------------------|-------------|----------|
|                             |          | L                        | T           | R         | L                        | T        | R        | L                        | T           | R*       | L*                       | T           | R        |
| 7:00 AM                     | 7:15 AM  | 42                       | 0           | 6         | 0                        | 0        | 0        | 0                        | 123         | 0        | 0                        | 262         | 0        |
| 7:15 AM                     | 7:30 AM  | 47                       | 0           | 5         | 0                        | 0        | 0        | 0                        | 140         | 0        | 0                        | 272         | 0        |
| 7:30 AM                     | 7:45 AM  | 14                       | 0           | 10        | 0                        | 0        | 0        | 0                        | 185         | 0        | 0                        | 344         | 0        |
| 7:45 AM                     | 8:00 AM  | 29                       | 0           | 10        | 0                        | 0        | 0        | 0                        | 187         | 0        | 0                        | 593         | 0        |
| 8:00 AM                     | 8:15 AM  | 22                       | 0           | 12        | 0                        | 0        | 0        | 0                        | 130         | 0        | 0                        | 622         | 0        |
| 8:15 AM                     | 8:30 AM  | 17                       | 0           | 8         | 0                        | 0        | 0        | 0                        | 126         | 0        | 0                        | 565         | 0        |
| 8:30 AM                     | 8:45 AM  | 15                       | 0           | 7         | 0                        | 0        | 0        | 0                        | 135         | 0        | 0                        | 330         | 0        |
| 8:45 AM                     | 9:00 AM  | 42                       | 0           | 44        | 0                        | 0        | 0        | 0                        | 148         | 0        | 0                        | 245         | 0        |
| <b>AM Peak Hour Volumes</b> |          | <b>82</b>                | <b>0</b>    | <b>40</b> | <b>0</b>                 | <b>0</b> | <b>0</b> | <b>0</b>                 | <b>628</b>  | <b>0</b> | <b>0</b>                 | <b>2124</b> | <b>0</b> |
| % of Total Traffic          |          | 2.9%                     | 0.0%        | 1.4%      | 0.0%                     | 0.0%     | 0.0%     | 0.0%                     | 21.9%       | 0.0%     | 0.0%                     | 73.9%       | 0.0%     |
| % Directional               |          |                          | 4.2%        |           |                          | 0.0%     |          |                          | 21.9%       |          |                          | 73.9%       |          |
| AM Peak Hour Factor         |          |                          | <b>0.78</b> |           |                          |          |          |                          | <b>0.84</b> |          |                          | <b>0.85</b> |          |

| Begin Time                  | End Time | Eastbound (I-40 S. Ramp) |             |           | Westbound (I-40 S. Ramp) |          |          | Northbound (Unser Blvd.) |             |          | Southbound (Unser Blvd.) |             |          |
|-----------------------------|----------|--------------------------|-------------|-----------|--------------------------|----------|----------|--------------------------|-------------|----------|--------------------------|-------------|----------|
|                             |          | L                        | T           | R         | L                        | T        | R        | L                        | T           | R*       | L*                       | T           | R        |
| 4:00 PM                     | 4:15 PM  | 48                       | 4           | 44        | 0                        | 0        | 0        | 0                        | 245         | 0        | 0                        | 382         | 0        |
| 4:15 PM                     | 4:30 PM  | 45                       | 0           | 7         | 0                        | 0        | 0        | 0                        | 240         | 0        | 0                        | 345         | 0        |
| 4:30 PM                     | 4:45 PM  | 22                       | 0           | 13        | 0                        | 0        | 0        | 0                        | 197         | 0        | 0                        | 354         | 0        |
| 4:45 PM                     | 5:00 PM  | 27                       | 0           | 16        | 0                        | 0        | 0        | 0                        | 208         | 0        | 0                        | 381         | 0        |
| 5:00 PM                     | 5:15 PM  | 35                       | 0           | 7         | 0                        | 0        | 0        | 0                        | 293         | 0        | 0                        | 334         | 0        |
| 5:15 PM                     | 5:30 PM  | 38                       | 0           | 11        | 0                        | 0        | 0        | 0                        | 240         | 0        | 0                        | 363         | 0        |
| 5:30 PM                     | 5:45 PM  | 34                       | 0           | 42        | 0                        | 0        | 0        | 0                        | 196         | 0        | 0                        | 348         | 0        |
| 5:45 PM                     | 6:00 PM  | 22                       | 0           | 42        | 0                        | 0        | 0        | 0                        | 205         | 0        | 0                        | 330         | 0        |
| <b>PM Peak Hour Volumes</b> |          | <b>122</b>               | <b>0</b>    | <b>47</b> | <b>0</b>                 | <b>0</b> | <b>0</b> | <b>0</b>                 | <b>938</b>  | <b>0</b> | <b>0</b>                 | <b>1432</b> | <b>0</b> |
| % of Total Traffic          |          | 4.8%                     | 0.0%        | 1.9%      | 0.0%                     | 0.0%     | 0.0%     | 0.0%                     | 36.9%       | 0.0%     | 0.0%                     | 56.4%       | 0.0%     |
| % Directional               |          |                          | 6.7%        |           |                          | 0.0%     |          |                          | 36.9%       |          |                          | 56.4%       |          |
| PM Peak Hour Factor         |          |                          | <b>0.86</b> |           |                          |          |          |                          | <b>0.80</b> |          |                          | <b>0.94</b> |          |

NOTE: Northbound right and southbound left turn movements are free right turn ramps (loops) that by-pass the intersection.

**Signalized Intersection Information Sheet**Intersection: Los Volcanes Rd. / Unser Blvd.Speed Limit - E-W Street: 30 M.P.H.

Date:

Speed Limit - N-S Street: 45 M.P.H.10/14/2010Type of Intersection Control: Signalized**East Bound Approach:****Los Volcanes Rd.**

|              | Left Turn Lanes         | Thru / Lefts | Left/Thru/Right   | Thru Lanes | Thru / Rights            | Right Turn Lanes |
|--------------|-------------------------|--------------|-------------------|------------|--------------------------|------------------|
| No. Lanes -  | 2                       | -            | -                 | -          | 1                        | -                |
| Length -     | 90                      |              |                   |            |                          | 0                |
| Protected -> | Left Turn Arrow?<br>YES |              | Thru Green<br>YES |            | Right Turn Arrow?<br>YES |                  |

Is there a right turn slip laned that by-passes the traffic signal?

NO**West Bound Approach:****Los Volcanes Rd.**

|                        | Left Turn Lanes         | Thru / Lefts | Left/Thru/Right   | Thru Lanes | Thru / Rights           | Right Turn Lanes |
|------------------------|-------------------------|--------------|-------------------|------------|-------------------------|------------------|
| No. Lanes -            | 1                       | -            | -                 | 1          | -                       | 1                |
| Length -               | 130                     |              |                   |            |                         | 130              |
| Permitted/Protected -> | Left Turn Arrow?<br>YES |              | Thru Green<br>YES |            | Right Turn Arrow?<br>NO |                  |

Is there a right turn slip laned that by-passes the traffic signal?

NO**North Bound Approach:****Unser Blvd.**

|                        | Left Turn Lanes         | Thru / Lefts | Left/Thru/Right   | Thru Lanes | Thru / Rights           | Right Turn Lanes |
|------------------------|-------------------------|--------------|-------------------|------------|-------------------------|------------------|
| No. Lanes -            | 1                       | -            | -                 | 2          | -                       | 1                |
| Length -               | 575                     |              |                   |            |                         | 150              |
| Permitted/Protected -> | Left Turn Arrow?<br>YES |              | Thru Green<br>YES |            | Right Turn Arrow?<br>NO |                  |

Is there a right turn slip laned that by-passes the traffic signal?

NO**South Bound Approach:****Unser Blvd.**

|                        | Left Turn Lanes         | Thru / Lefts | Left/Thru/Right   | Thru Lanes | Thru / Rights            | Right Turn Lanes |
|------------------------|-------------------------|--------------|-------------------|------------|--------------------------|------------------|
| No. Lanes -            | 1                       | -            | -                 | 2          | -                        | 1                |
| Length -               | 999                     |              |                   |            |                          | 130              |
| Permitted/Protected -> | Left Turn Arrow?<br>YES |              | Thru Green<br>YES |            | Right Turn Arrow?<br>YES |                  |

Is there a right turn slip laned that by-passes the traffic signal?

NO**NOTE:** Existing Geometry

**Signalized Intersection Information Sheet**Intersection: Bluewater Rd. / Unser Blvd.Speed Limit - E-W Street: 30 M.P.H.

Date:

Speed Limit - N-S Street: 45 M.P.H.10/14/2010Type of Intersection Control Signalized**East Bound Approach:****Bluewater Rd.**

|                        | Left Turn Lanes  | Thru / Lefts | Left/Thru/Right | Thru Lanes | Thru / Rights     | Right Turn Lanes |
|------------------------|------------------|--------------|-----------------|------------|-------------------|------------------|
| No. Lanes -            | 1                | -            | -               | -          | 1                 | -                |
| Length -               | 90               |              |                 |            |                   | 0                |
|                        | Left Turn Arrow? |              | Thru Green      |            | Right Turn Arrow? |                  |
| Permitted/Protected -> | YES              |              | YES             |            | NO                |                  |

Is there a right turn slip laned that by-passes the traffic signal?

NO**West Bound Approach:****Bluewater Rd.**

|              | Left Turn Lanes  | Thru / Lefts | Left/Thru/Right | Thru Lanes | Thru / Rights     | Right Turn Lanes |
|--------------|------------------|--------------|-----------------|------------|-------------------|------------------|
| No. Lanes -  | 1                | -            |                 | 1          | -                 | 1                |
| Length -     | 130              |              |                 |            |                   | 130              |
|              | Left Turn Arrow? |              | Thru Green      |            | Right Turn Arrow? |                  |
| Permitted -> | NO               |              | YES             |            | NO                |                  |

Is there a right turn slip laned that by-passes the traffic signal?

NO**North Bound Approach:****Unser Blvd.**

|                        | Left Turn Lanes  | Thru / Lefts | Left/Thru/Right | Thru Lanes | Thru / Rights     | Right Turn Lanes |
|------------------------|------------------|--------------|-----------------|------------|-------------------|------------------|
| No. Lanes -            | 1                | -            |                 | 2          | -                 | 1                |
| Length -               | 110              |              |                 |            |                   | 340              |
|                        | Left Turn Arrow? |              | Thru Green      |            | Right Turn Arrow? |                  |
| Permitted/Protected -> | YES              |              | YES             |            | NO                |                  |

Is there a right turn slip laned that by-passes the traffic signal?

YES-Yield**South Bound Approach:****Unser Blvd.**

|                        | Left Turn Lanes  | Thru / Lefts | Left/Thru/Right | Thru Lanes | Thru / Rights     | Right Turn Lanes |
|------------------------|------------------|--------------|-----------------|------------|-------------------|------------------|
| No. Lanes -            | 1                | -            |                 | 2          | -                 | 1                |
| Length -               | 160              |              |                 |            |                   | 160              |
|                        | Left Turn Arrow? |              | Thru Green      |            | Right Turn Arrow? |                  |
| Permitted/Protected -> | YES              |              | YES             |            | NO                |                  |

Is there a right turn slip laned that by-passes the traffic signal?

YES-Yield**NOTE:** Existing Geometry

**Data Entry Sheet**  
**Determination of Warrants for Deceleration Lanes**  
**NM DOT State Access Management Manual Criteria**  
**Driveway 'C' / Unser Blvd**

**Project Information:**

Project Name: Valero Commercial Development  
 Project Location: (Los Volcanes Rd / Unser Blvd)  
 Implementation Year: 2012  
 Project Environment: Urban Multi-Lane

**Street Information:**

Major Street Name: Unser Blvd  
 Minor Street Name: Driveway 'C'

**Intersection Information:**

|              | Orientation | Prevailing Speed | No. Lanes Each Direction |
|--------------|-------------|------------------|--------------------------|
| Driveway 'C' | Eastbound   | 25               | N/A                      |
| Unser Blvd   | North-South | 45               | 2                        |

Determine Case:

Case

- 1 Urban Two-Lane Highway - Use Table 17.B.1
- 2 Urban Multi-Lane Highway - Use Table 17.B-2
- 3 Rural Two Lane Highway - Use Table 17.B-3 and 17.B-5
- 4 Rural Multi-Lane Highway - Use Table 17.B-4 and 17.B-6

Unser Blvd is Case 2  
 Speed Category 45 to 55

**SB Right Turn Volumes**

2012 AM Pk. Hr. NO BUILD  
 2012 AM Pk. Hr. BUILD  
 2012 PM Pk. Hr. NO BUILD  
 2012 PM Pk. Hr. BUILD

0  
0  
0  
7

**SB Thru Volumes**

1708  
1740  
1359  
1382

**NB Left Turn Volumes**

2012 AM Pk. Hr. NO BUILD  
 2012 AM Pk. Hr. BUILD  
 2012 PM Pk. Hr. NO BUILD  
 2012 PM Pk. Hr. BUILD

0  
0  
0  
0

**NB Thru Volumes**

1424  
1454  
1332  
1353

## Determination of Warrants for Auxiliary Lanes

Project Name: **Valero Commercial Development**  
 Name of Highway: **Unser Blvd**  
 Name of Cross Street: **Driveway 'C'**

Determination of Warrants for: Eastbound Driveway

Implementation Year Volumes - **2012** Posted Speed Limit: **45**

### Right Turn Deceleration Lane - Implementation Year Volumes

| Condition             | Year | Projected Right Turn Volume | Warrant Volume in thru Lane | Projected Volume in thru Lane | ✓ if Met | Lane Length (Deceleration)* | Adjustment Factor for Grade** | Lane Length (Storage)*** | Total Lane Length | Taper Ratio |
|-----------------------|------|-----------------------------|-----------------------------|-------------------------------|----------|-----------------------------|-------------------------------|--------------------------|-------------------|-------------|
| AM Peak Hour NO BUILD | 2012 | -                           | -                           | 854                           |          | N/A                         |                               | -                        | N/A               | N/A         |
| AM Peak Hour BUILD    | 2012 | -                           | -                           | 870                           |          | N/A                         |                               | -                        | N/A               | N/A         |
| PM Peak Hour NO BUILD | 2012 | -                           | -                           | 680                           |          | N/A                         |                               | -                        | N/A               | N/A         |
| PM Peak Hour BUILD    | 2012 | 7                           | 398                         | 691                           | ✓        | 400                         | 1.00                          | -                        | 400               | 12.5:1      |

Based on Table 17.B-2 (Criteria for Deceleration Lanes on Urban Multi-Lane Highways)

### Left Turn Deceleration Lane - Implementation Year Volumes

| Condition             | Year | Projected Left Turn Volume | Warrant Volume in thru Lane | Projected Volume in thru Lane | ✓ if Met | Lane Length (Deceleration)* | Adjustment Factor for Grade** | Lane Length (Storage)*** | Total Lane Length | Taper Ratio |
|-----------------------|------|----------------------------|-----------------------------|-------------------------------|----------|-----------------------------|-------------------------------|--------------------------|-------------------|-------------|
| AM Peak Hour NO BUILD | 2012 | -                          | -                           | 712                           |          | N/A                         |                               | N/A                      | N/A               | N/A         |
| AM Peak Hour BUILD    | 2012 | -                          | -                           | 727                           |          | N/A                         |                               | N/A                      | N/A               | N/A         |
| PM Peak Hour NO BUILD | 2012 | -                          | -                           | 666                           |          | N/A                         |                               | N/A                      | N/A               | N/A         |
| PM Peak Hour BUILD    | 2012 | -                          | -                           | 677                           |          | N/A                         |                               | N/A                      | N/A               | N/A         |

Based on Table 17.B-2 (Criteria for Deceleration Lanes on Urban Multi-Lane Highways)

\* Lane Length Requirements based on Table 18.K-1 (Deceleration and Acceleration Lengths)

\*\* Enter Grade Adjustment Factor from Table 18.K-2 or other criteria.

\*\*\* Lane Storage Length is Based on a calculated 3-minute queue based on average arrival rate per minute.

= Volume/Hr. divided by 60 times three (rounded) times 25 feet per vehicle.

Lane Storage Length for right turn decel lanes is zero unless there is a stop condition.

#### Notes and Comments:

1. This warrant sheet is for the eastbound Driveway 'C' at 100% Development of the Project

**Table 17.B-2**  
**Criteria For Deceleration Lanes On**  
**URBAN MULTI-LANE HIGHWAYS**

| Turning<br>Volume <sup>1</sup><br>(vph) | LEFT-TURN DECELERATION LANE                                                                                                                                                                                                                                                    |              |              | RIGHT-TURN DECELERATION LANE                                                                                                                                                                                                                                                     |              |              |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|
|                                         | Minimum Volume in Adjacent Through Lane<br>(vphpl) <sup>2</sup>                                                                                                                                                                                                                |              |              | Minimum Volume in Adjacent Through Lane<br>(vphpl) <sup>2</sup>                                                                                                                                                                                                                  |              |              |
|                                         | ≤30 mph                                                                                                                                                                                                                                                                        | 35 to 40 mph | 45 to 55 mph | ≤30 mph                                                                                                                                                                                                                                                                          | 35 to 40 mph | 45 to 55 mph |
| <5                                      | Not Required                                                                                                                                                                                                                                                                   | Not Required | Not Required | Not Required                                                                                                                                                                                                                                                                     | Not Required | Not Required |
| 5                                       | Not Required                                                                                                                                                                                                                                                                   | 490          | 420          | 1,200                                                                                                                                                                                                                                                                            | 730          | 450          |
| 10                                      | 420                                                                                                                                                                                                                                                                            | 370          | 300          | 820                                                                                                                                                                                                                                                                              | 490          | 320          |
| 15                                      | 360                                                                                                                                                                                                                                                                            | 290          | 220          | 600                                                                                                                                                                                                                                                                              | 350          | 240          |
| 20                                      | 310                                                                                                                                                                                                                                                                            | 230          | 160          | 460                                                                                                                                                                                                                                                                              | 260          | 180          |
| 25                                      | 270                                                                                                                                                                                                                                                                            | 190          | 130          | 360                                                                                                                                                                                                                                                                              | 230          | 150          |
| 30                                      | 240                                                                                                                                                                                                                                                                            | 160          | 110          | 290                                                                                                                                                                                                                                                                              | 200          | 130          |
| 35                                      | 210                                                                                                                                                                                                                                                                            | 130          | 100          | 260                                                                                                                                                                                                                                                                              | 180          | 120          |
| 40                                      | 180                                                                                                                                                                                                                                                                            | 120          | Required     | 240                                                                                                                                                                                                                                                                              | 170          | 110          |
| 45                                      | 160                                                                                                                                                                                                                                                                            | 110          | Required     | 220                                                                                                                                                                                                                                                                              | 160          | Required     |
| 50                                      | 140                                                                                                                                                                                                                                                                            | Required     | Required     | 200                                                                                                                                                                                                                                                                              | Required     | Required     |
| 55                                      | 120                                                                                                                                                                                                                                                                            | Required     | Required     | 190                                                                                                                                                                                                                                                                              | Required     | Required     |
| ≥56                                     | Required                                                                                                                                                                                                                                                                       | Required     | Required     | Required                                                                                                                                                                                                                                                                         | Required     | Required     |
|                                         | <i>Left-turn Decelerataion Lanes are Required on Urban Multi-lane Highways for the following Left-turn Volumes:</i> <ul style="list-style-type: none"><li>• ≤30 mph : 56 vph or more</li><li>• 35 to 40 mph : 46 vph or more</li><li>• 45 to 55 mph : 36 vph or more</li></ul> |              |              | <i>Right-turn Decelerataion Lanes are Required on Urban Multi-lane Highways for the following Right-turn Volumes:</i> <ul style="list-style-type: none"><li>• ≤30 mph : 56 vph or more</li><li>• 35 to 40 mph : 46 vph or more</li><li>• 45 to 55 mph : 41 vph or more</li></ul> |              |              |

Notes:

1. Use linear interpolation for turning volumes between 5 and 55 vph.
2. The volume in the adjacent through lane includes through vehicles and turning vehicles.

**Table 18.K-1**  
**Deceleration and Acceleration Lengths (feet)**

| Speed Change Lane Condition     | Posted Speed (mph) |     |      |        |        |        |        |        |       |       |
|---------------------------------|--------------------|-----|------|--------|--------|--------|--------|--------|-------|-------|
|                                 | 25                 | 30  | 35   | 40     | 45     | 50     | 55     | 60     | 65    | 70    |
| <u>Deceleration Distance</u>    |                    |     |      |        |        |        |        |        |       |       |
| Stop Condition                  | 150                | 200 | 250  | 325    | 400    | 475    | 550    | 650    | 725   | 850   |
| Slow to 15 MPH                  | 130                | 175 | 230  | 300    | 370    | 450    | 525    | 620    | 700   | 820   |
| <u>Deceleration Taper</u>       |                    |     |      |        |        |        |        |        |       |       |
| Length for 12-foot Lane         | 50                 | 75  | 100  | 125    | 150    | 175    | 200    | 225    | 250   | 250   |
| Straight Line Ratios (L:W)      | 4:1                | 6:1 | 8:1  | 10.5:1 | 12.5:1 | 14.5:1 | 16.5:1 | 18.5:1 | 21:1  | 21:1  |
|                                 |                    |     |      |        |        |        |        |        |       |       |
| <u>Acceleration Lane Length</u> |                    |     |      |        |        |        |        |        |       |       |
| Acceleration Taper              | N/A                | 190 | 270  | 380    | 550    | 760    | 960    | 1,170  | 1,380 | 1,590 |
|                                 |                    |     |      |        |        |        |        |        |       |       |
| Length of 12-foot Lane          | N/A                | 100 | 120  | 150    | 170    | 180    | 230    | 270    | 300   | 300   |
| Straight Line Ratios (L:W)      | N/A                | 8:1 | 10:1 | 12.5:1 | 14:1   | 15:1   | 19:1   | 22.5:1 | 25:1  | 25:1  |