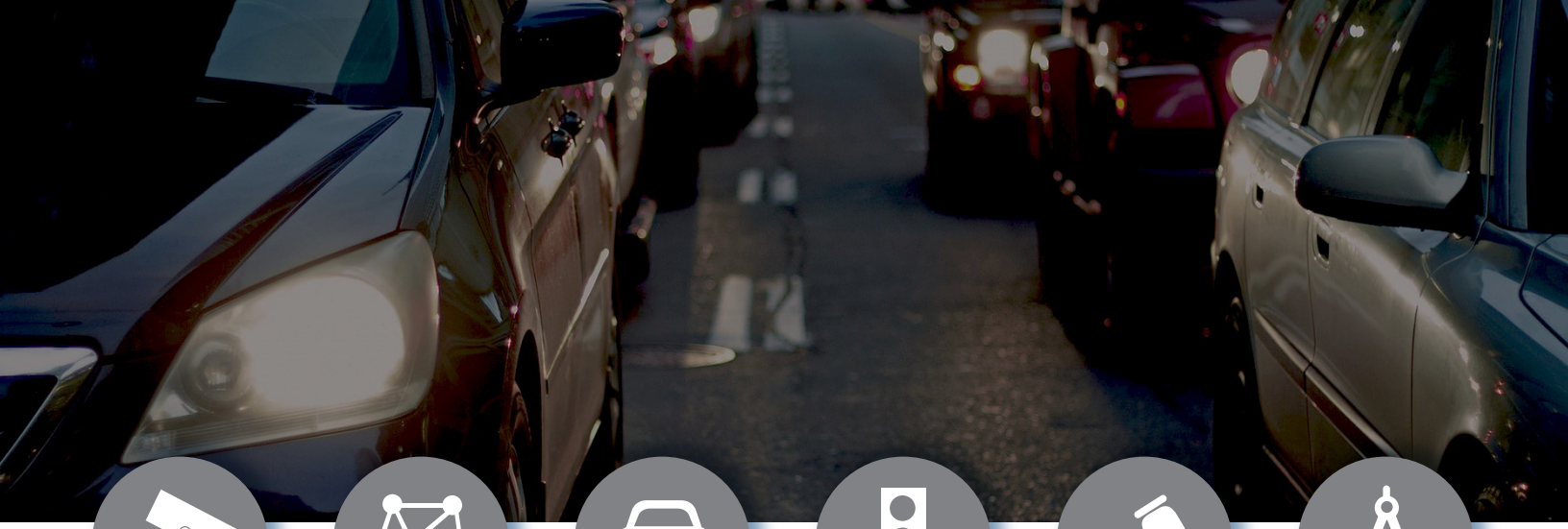

TRAFFIC IMPACT STUDY
JLM Living Paseo

Draft Report
July 2024

Prepared for
Cobb Fendley and Associates

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Traffic Impact Study (TIS)
JLM Living Paseo

Draft Report

July 2024

Prepared for:

Cobb Fendley and Associates

Prepared By:

EXECUTIVE SUMMARY

The following contains a Traffic Impact Study (TIS) for a single-family detached housing development to be developed on the west side of Unser Boulevard in Albuquerque, New Mexico. Lee Engineering has completed this report for Cobb Fendley and Associates. All analyses and items contained herein conform to scoping requirements set forth in a scoping meeting held on April 23rd, 2024.

BACKGROUND

The proposed development is a single-family housing development located southeast side of Universe Boulevard NW and Woodmont Avenue NW.

The site, which is to include approximately 235 dwelling units, is anticipated to generate 42 ingress and 120 egress trips during the AM peak hour, and 140 ingress trips and 82 egress trips during the PM peak hour. The number of vehicle trips generated by the proposed development was based on the trip generation rates and equations provided in the Trip Generation Manual, 11th Edition, by the Institute of Transportation Engineers (ITE) 210 – Single Family Detached.

Site access is available according to current site plans through one site access driveway on the extension of Woodmont Avenue and one on Universe Boulevard.

Study intersections include:

1) Universe Boulevard and Woodmont Avenue
2) Unser Boulevard and Woodmont Avenue Extension
3) Woodmont Avenue Extension and Site Driveway 1
4) Universe Boulevard and Site Driveway 2

For the purposes of this analysis, the development is assumed to reach full completion by 2025. The development is to be constructed in one phase.

Analysis scenarios for this study include:

- Existing 2024 – Existing traffic volumes
- Build-Out Year 2025 Background – 2025 traffic volumes projected from the Existing traffic volumes via the application of a growth factor developed from the MRCOG Metropolitan Transportation Plan (MTP) CUBE/2 Regional Model plus trips generated by the adjacent developments.
- Build-Out Year 2025 Total – 2025 Background volumes plus trips generated by the proposed development.
- Horizon Year 2035 Background – 2035 traffic volumes projected from the Existing traffic volumes via the application of a growth factor developed from the MRCOG Metropolitan Transportation Plan (MTP) CUBE/2 Regional Model plus trips generated by the adjacent developments with a completion year of 2025.
- Horizon Year 2035 Total – 2035 Background volumes plus trips generated by the proposed development.

Turning movement counts (TMC) were collected for nine hours on Thursday, May 2nd, 2024, for the intersection of Universe Boulevard and Woodmont Avenue. A 45-hour traffic data was also collected from 2:00 PM on Wednesday, May 1st, 2024, to 11:00 AM on Friday, May 3rd, 2024, for Unser Boulevard near the study area.
These volumes were analyzed unaltered in the Existing scenario of the Level of Service and Queueing Analysis section. Volumes for the proposed driveways were balanced using existing counts from

surrounding intersections. Site trips for the proposed development site were generated based on ITE 210 – Single Family Detached. Proposed development-generated trips were used to analyze Build-Out Year 2025 and Horizon Year 2035 Total volumes.

SUMMARY OF TRAFFIC ANALYSIS AND RECOMMENDATIONS

The following presents a summary of the traffic analysis and recommendations included in this report.

CONCLUSIONS

Traffic operations for the Existing scenario are summarized as follows:

- Universe Boulevard and Woodmont Avenue
  - All movements currently operate at acceptable LOS during the AM and PM peaks except the EBL movement, which operates at LOS F with a V/C ratio of less than 1 during the PM peak hour.
  - The existing storage lengths are sufficient to accommodate 95th-percentile queue lengths.

Traffic operations for the Build-Out Year 2025 Background scenario are summarized as follows:

- Universe Boulevard and Woodmont Avenue
  - All movements are expected to operate at acceptable LOS during the AM and PM peaks except the EBL movement, which is expected to operate at LOS F, similar to the existing conditions, with a V/C ratio of greater than 1 during the PM peak hour.
  - The existing storage lengths are sufficient to accommodate 95th-percentile queue lengths.

Traffic operations for the Build-Out Year 2025 Full-Build scenario are summarized as follows:

- Universe Boulevard and Woodmont Avenue
  - EBL movement is expected to operate at LOS E with a V/C ratio of less than 1 during the AM peak hour.
  - EBL movement is expected to operate at LOS F with a V/C ratio of greater than 1 and a delay of 566.7 seconds during the PM peak hour.
  - EBT movement and the westbound approach are expected to operate below LOS D with V/C ratios of less than 1 during the PM peak hour.
  - All other movements are expected to operate at acceptable LOS.
  - EBL movement is expected not to accommodate 95th-percentile queue lengths during the PM peak hour.
  - All other storage lengths are sufficient to accommodate 95th-percentile queue lengths during the AM and PM peak hours.

- Unser Boulevard and the extension of Woodmont Avenue
  - EBL movement is expected to operate at LOS E with a V/C ratio of less than 1 during the PM peak hour.
  - All other movements are expected to operate at acceptable LOS.

- The extension of Woodmont Avenue and Driveway 1
  - All movements are expected to operate at LOS B or better.

- Universe Boulevard and Driveway 2
    - All movements are expected to operate at LOS C or better.

Traffic operations for the Horizon Year 2035 Background scenario are summarized as follows:

- Universe Boulevard and Woodmont Avenue
    - All movements are expected to operate at acceptable LOS during the AM and PM peaks except the EBL movement, which is expected to operate at LOS F during both peak hours. A review of the V/C ratio indicated that a V/C ratio of less than 1 during the AM peak hour and greater than 1 during the PM peak hour are expected for the EBL movement.
    - The storage lengths are sufficient to accommodate 95th-percentile queue lengths except for the EBL movement during the PM peak hour.

Traffic operations for the Horizon Year 2035 Full-Build scenario are summarized as follows:

- Universe Boulevard and Woodmont Avenue
    - EBL movement and westbound approach are expected to operate below LOS D with V/C ratios of less than 1 during the AM peak hour.
    - EBL movement is expected to operate at LOS F with a V/C ratio greater than 1 and a delay of greater than 16 minutes during the PM peak hour.
    - EBT movement and the westbound approach are expected to operate at LOS F with V/C ratios of less than 1 during the PM peak hour.
    - EBL movement is expected not to accommodate 95th-percentile queue lengths during the PM peak hour.
    - All other storage lengths are expected to be sufficient to accommodate 95th-percentile queue lengths during the AM and PM peak hours.

- Unser Boulevard and the extension of Woodmont Avenue
    - EBL movement is expected to operate at LOS E with a V/C ratio of less than 1 during the PM peak hour.
    - All other movements are expected to operate at acceptable LOS.

- The extension of Woodmont Avenue and Driveway 1
    - All movements are expected to operate at LOS B or better.

- Universe Boulevard and Driveway 2
    - All movements are expected to operate at LOS C or better.

SITE RECOMMENDATIONS

Recommendations for study intersections directly serving and primarily impacted by the proposed development are provided as follows:

- Universe Boulevard and Woodmont Avenue
    - A southbound left-turn deceleration lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of reverse curve is recommended.

- Unser Boulevard and Woodmont Avenue Extension
  - An eastbound left-turn deceleration lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of reverse curve is recommended.
  - A northbound left-turn deceleration lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of the reverse curve is recommended.
  - A southbound right-turn deceleration lane with a minimum storage length of 240 feet and a transition length of 300 feet with 150 feet of reverse curve is recommended.

- Woodmont Avenue Extension and Driveway 1
  - A westbound left-turn lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of the reverse curve is recommended.

OFF-SITE INTERSECTION RECOMMENDATIONS

Recommendations for intersections within the study area that do not directly serve the proposed development and are impacted by multiple developments in the area are provided as follows:

- Universe Boulevard and Woodmont Avenue
  - A southbound right-turn lane with a minimum storage length of 240 feet and a transition length of 300 feet with 150 feet of reverse curve is recommended.
  - The eastbound approach should be re-striped / re-configured with left / through / right lane assignments.
  - Installing a signal traffic control would mitigate poor LOS per Synchro analysis. If installed, a formal signal warrant analysis should be completed within one year of the development's completed construction. It should be noted that the Synchro results show that all movements are expected to operate at acceptable LOS during peak hours. Additionally, the Synchro results indicate that the existing eastbound left-turn deceleration lane with a storage length of 180 feet is expected to be sufficient to accommodate 95th-percentile queue lengths during peak hours under the mitigation scenario.
  - The proposed development contributes averaged 4.79% of the total Build-Out Year 2025 Full-Build and Horizon Year 2035 Full-Build traffic volumes during the AM and PM peak hours.

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

LIST OF APPENDICES

INTRODUCTION

This report details the procedures and findings of a Traffic Impact Study (TIS) performed by Lee Engineering for Cobb Fendley and Associates. This report and the analyses herein were performed for a single-family detached housing development to be constructed on the west side of Unser Boulevard in Albuquerque, New Mexico. This study examines the impacts of the proposed development on surrounding traffic conditions and discusses the potential impacts of trips generated by the development on the study intersections.

The scope of this report and the analyses performed were completed in agreement with the scoping requirements set forth by the City of Albuquerque (CABQ). Scoping meeting notes from the scoping meeting held on April 23rd, 2024, are included in Appendix A. Analysis procedures, conclusions, and recommendations for this study were developed according to the *Highway Capacity Manual (HCM) 6th Edition* and the *Manual on Uniform Traffic Control Devices (MUTCD) 2009 Edition*.

For the purposes of this analysis, the development is assumed to be completed in one phase and to reach full completion by 2025. The site plan displayed in Figure 1 shows that the proposed development is a residential development. Traffic generated by the site is anticipated to be 42 ingress and 120 egress trips during the AM peak hour, 140 ingress trips, and 82 egress trips during the PM peak hour. Figure 2 shows the site location, study intersections, and the surrounding area. Lee Engineering conducted a Level of Service and Queuing Analysis for the following AM and PM peak hour scenarios:

Traffic Analysis

- Existing 2024 – Existing traffic volumes
- Build-Out Year 2025 Background – 2025 traffic volumes projected from the Existing traffic volumes via the application of a growth factor developed from the MRCOG Metropolitan Transportation Plan (MTP) CUBE/2 Regional Model plus trips generated by the adjacent developments.
- Build-Out Year 2025 Total – 2025 Background volumes plus trips generated by the proposed development.
- Horizon Year 2035 Background – 2035 traffic volumes projected from the Existing traffic volumes via the application of a growth factor developed from the MRCOG Metropolitan Transportation Plan (MTP) CUBE/2 Regional Model plus trips generated by the adjacent developments with a completion year of 2025.
- Horizon Year 2035 Total – 2035 Background volumes plus trips generated by the proposed development.

The Level of Service and Queuing Analysis Reports are presented in full in the Appendix.

BACKGROUND INFORMATION

PROJECT LOCATION & SITE PLAN

The single-family detached housing development will be located southeast side of Universe Boulevard NW and Woodmont Avenue NW. Figure 1 shows the complete proposed site plan, and Figure 2 shows the site location, study intersections, and the surrounding area. Nearby intersections include the following:

1) Universe Boulevard and Woodmont Avenue
2) Unser Boulevard and Woodmont Avenue Extension
3) Woodmont Avenue Extension and Site Driveway 1
4) Universe Boulevard and Site Driveway 2

The proposed development would convert approximately 18.93 acres of vacant land into a single-family housing development. Proposed access points include one site driveway (the main access point) on the extension of Woodmont Avenue and one (the secondary access point) on Universe Boulevard.

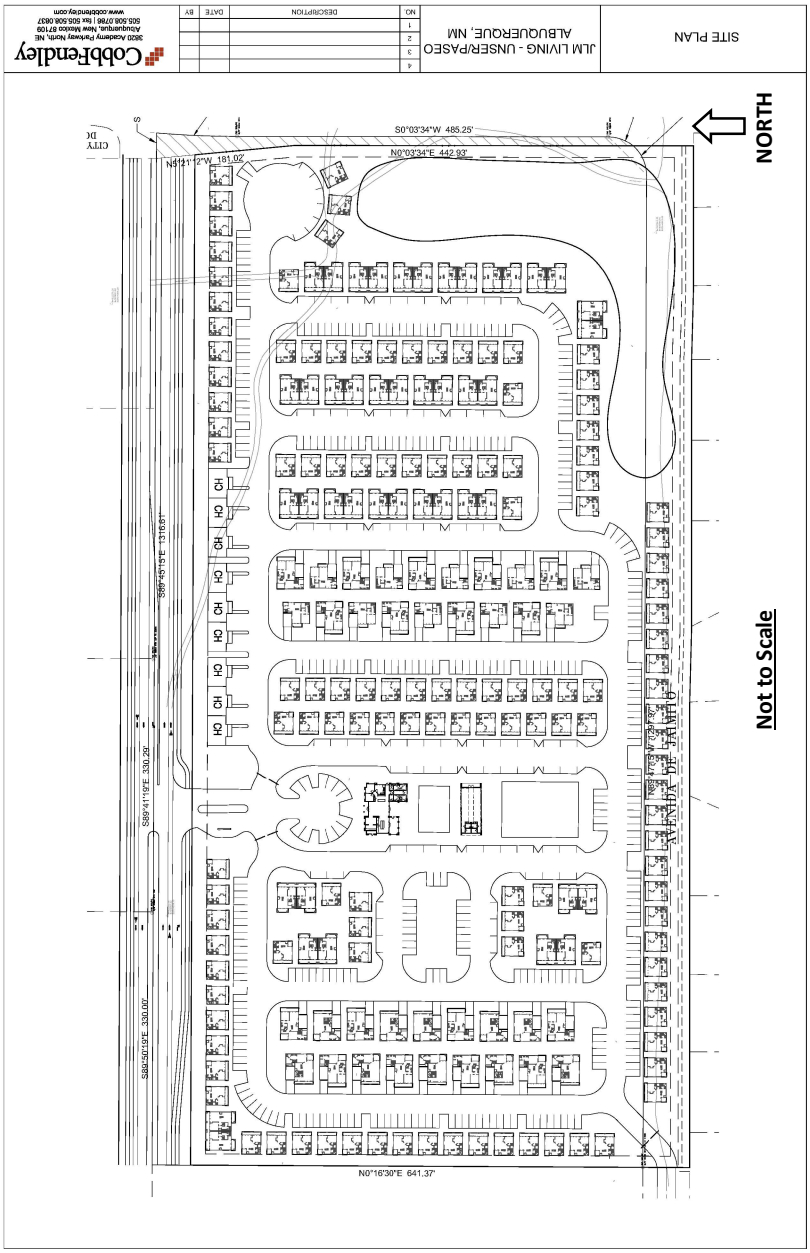


Figure 1: Site Plan

Figure 2: Vicinity Map

Study Area, Area Land Use, and Streets Narrative Summary

STUDY AREA

The study area is defined as the area surrounded by the subject land, between Universe Boulevard and Unser Boulevard. The following intersections were identified for analysis during the scoping meeting:

1) Universe Boulevard and Woodmont Avenue
2) Unser Boulevard and Woodmont Avenue Extension
3) Woodmont Avenue Extension and Site Driveway 1
4) Universe Boulevard and Site Driveway 2

AREA LAND USE

As described, the development is to be located on the southeast side of Universe Boulevard and Woodmont Avenue. Adjacent to and surrounding the project site are land uses consisting of the following:

- Residential: The existing land use to the west of the site is residential and zoned R-1A (Residential Single-Family Small Lot).
- Undeveloped: The land surrounding to the north, south, and east of the site is currently undeveloped. The land to the south is zoned R-1D (Residential Single-Family Extra-Large Lot); to the north, it is zoned MX-M (Mixed-Use Moderate Intensity) and NR-BP (Non-Residential Business Park). The land to the east is zoned MX-M (Mixed-Use Moderate Intensity) and MX-T (Mixed-Use Transition).
- Educational: Schools located within 2 miles of the proposed development include Volcano Vista High School, Tony Hillerman Middle School, and Tierra Antigua Elementary School to the southwest on Rainbow Boulevard, Ventana Ranch Elementary School to the north on Ventana Village Road, Coyote Willow Family School to the north on Irving Boulevard, Sunset View

Elementary School, James Monroe Middle School, and Paradise Christian School to the northeast on Paradise Boulevard, Sierra Vista Elementary School to the northeast on Paseo Del Norte, Chamiza Elementary School and Marie M. Hughes Elementary School to the southeast of the subject study.

STREETS

The following details the characteristics and features of streets included in the study area:

Universe Boulevard is a CABQ-maintained, two-lane, undivided roadway that runs north and south. The roadway is classified by the Mid-Region Metropolitan Planning Organization (MRMPO) *2040 Long Range Roadway System* (LRRS) as a minor arterial, and the posted speed limit is 35 miles per hour (MPH) within the study area. There is one 11-foot travel lane in each direction. Sidewalks, curbs, gutters, and a 6-foot bike lane are present only on the west side of the roadway near the study area.

Woodmont Avenue is a CABQ-maintained, east-west four-lane roadway separated by a raised median near the study area. The roadway is classified by MRMPO *2040 Long Range Roadway System* as a minor arterial, and the posted speed limit is 35 MPH within the study area. The roadway has bike lanes on both sides of the roadway, sidewalk on the south side, and a paved multi-use facility path on the north side. Curbs and gutters exist on both sides of the roadway. It should be noted that Woodmont Avenue is planned to be extended to the east with the development of the subject site to intersect Unser Boulevard.

Unser Boulevard is a CABQ-maintained, two-lane roadway that runs north and south. The roadway is classified by MRMPO *2040 Long Range Roadway System* as a regional principal arterial, and the posted speed limit is 35 MPH. In the vicinity of the site, the roadway has a width of about 55 feet consisting of a 26-foot raised median and one travel lane in each direction, but it transitions to a 35-foot-wide two-lane undivided roadway. In the vicinity of the site, curbs and gutters exist on the east side of the roadway. However, no curb or gutter exists on either side of the roadway, starting from Ave De Jaimito to the north. No sidewalk or bike lane is present.

INTERSECTIONS

The following details the traffic control and characteristics of the existing intersection in the study area:

Universe Boulevard and Woodmont Avenue is a 3-legged, stop-controlled intersection with a stop sign on Woodmont Avenue. The west leg currently comprises a continuous left-turn lane and a continuous right-turn lane. The roadway is wide enough to accommodate the future eastbound through lane. The north leg comprises a shared through/right-turn lane. The south leg consists of a through lane and a left-turn lane with a storage length of about 300 feet. There are no marked crosswalks present.

BICYCLE FACILITIES

Currently, bicycle lanes are present within the study area on Woodmont Avenue and the west side of Universe Boulevard. The Mid-Region Metropolitan Planning Organization (MRMPO) *Long Range Bikeway System* has proposed additional bicycle lanes and paved trails on Unser Boulevard and the future extension of Woodmont Avenue.

Figure 3 shows the existing lane configurations and traffic control for the study intersections.

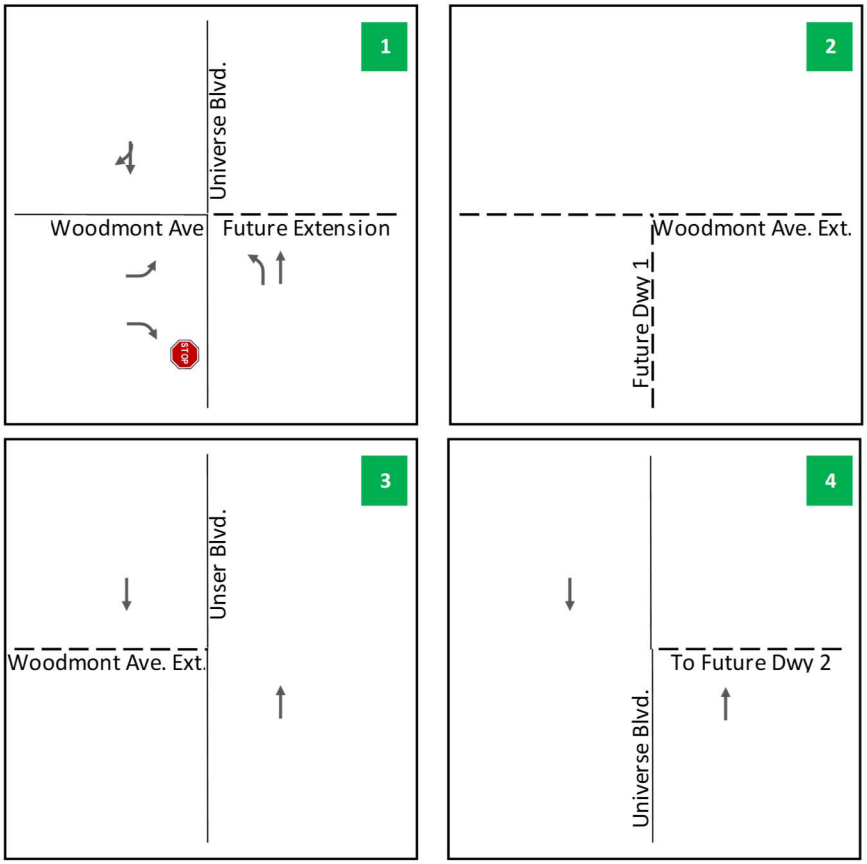


Figure 3: Existing Lane Configurations and Traffic Control

Data Collection

The following section details the data collection method used in subsequent analyses of this report. The data discussed below was collected via a combination of field observations and machine/video recordings.

FIELD DATA COLLECTION

On-Street Parking

A review of Google Street View images indicated that no dedicated on-street parking space is provided in the study area.

Bicycles

Bicycle volumes were collected at the study intersection of Woodmont Avenue and Universe Boulevard with turning movement counts (see Turning Movement Counts section below). Bicycle hourly volumes are provided in Appendix B.

Transit

Based on the ABQRIDE *System Map* (March 2023), no transit routes serve the study area.

TRAFFIC SCENARIO DEVELOPMENT

The following sections detail the methods and calculations used to obtain traffic volumes for the existing 2025 and 2035 analysis scenarios. This process used the following tools as described below: Traffic Projections, Site Trip Generation, and Trip Distribution and Assignment. Figures at the end of this section show the resulting traffic volumes determined for the 2025 and 2035 analysis scenarios.

Traffic Counts, Growth Rates, Adjacent Site Trips, and Trip Generations

TURNING MOVEMENT COUNTS

Turning movement counts (TMC) were collected for nine hours in three periods: 6:00 AM-9:00 AM, 11:00 AM-2:00 PM, and 3:30 PM-6:30 PM on Thursday, May 2nd, 2024, for the intersection of Woodmont Avenue and Universe Boulevard. A 45-hour traffic data was also collected from 2:00 PM on Wednesday, May 1st, 2024, to 11:00 AM on Friday, May 3rd, 2024, for Unser Boulevard near the study area. Turning movement volumes collected at the study intersections show a typical commuter directionally biased distribution with an observable AM and PM peak hour periods. Table 1 shows the observed peak hours for each existing study intersection. The existing peak-hour turning movement volumes collected for each intersection (not a system peak hour) were used for this study as shown in Figure 4; Complete turning movement counts can be found in Appendix B. Through movement traffic volumes for the proposed driveways were assumed based on existing volumes for the surrounding driveways.

Table 1: Intersection Peak hour

Intersection	AM Peak Hour	PM Peak Hour
Universe Boulevard and Woodmont Avenue	7:45 AM	3:45 PM
Unser Boulevard and Woodmont Avenue Extension	7:00 AM	4:30 PM

XX (XX) AM (PM) Peak-Hour Volume

Intersection Approach Movement

Planned Roadways

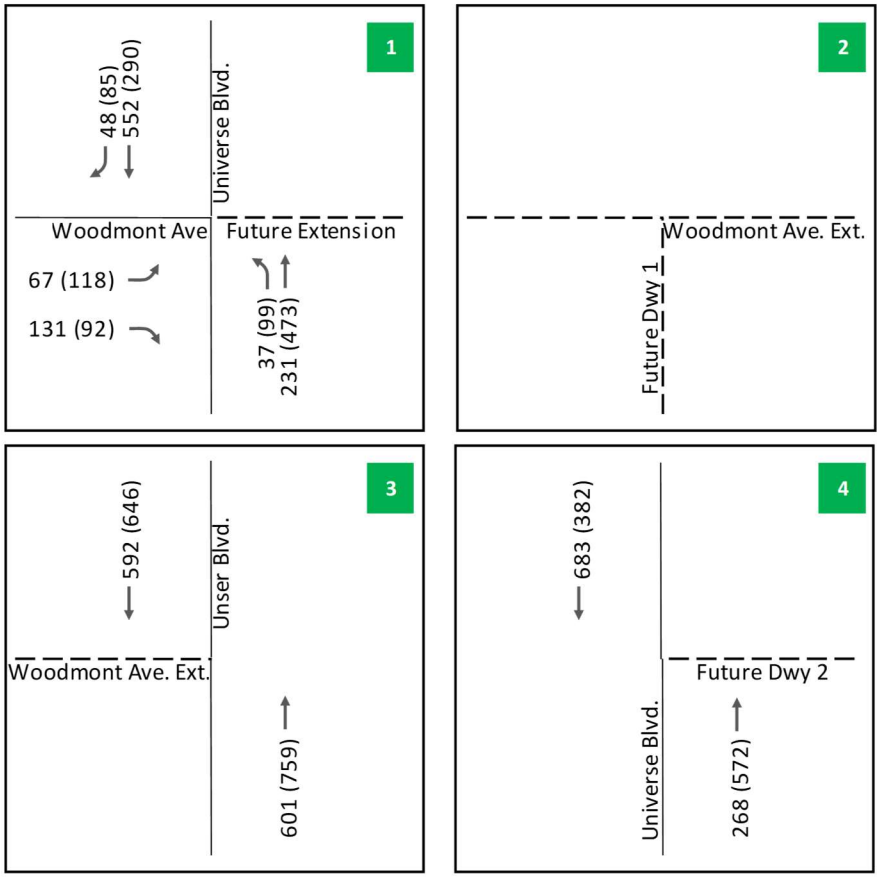


Figure 4: Existing Peak Hour Turning Movement Counts

TRAFFIC GROWTH

For the purposes of this analysis, the future year volumes were forecast from existing traffic volumes using values from 2016 and 2040 (updated) travel demand models provided by MRCOG. These models were then compared using AM and PM peak hour direction volumes (AMPH LOAD and PMPH LOAD) to calculate anticipated growth rates for individual roadways near the study area. Roadways calculated to have a yearly growth rate of less than 1.5% were analyzed with a 1.5% per year growth rate to facilitate a conservative analysis. The growth rate was then converted to a growth factor for specific analysis scenarios. Values provided by MRCOG are reproduced verbatim in Table 2, in addition to the calculated growth rates used in the analysis. An annual growth rate of 1.5% was then applied to the 2024 existing volumes to forecast future volumes. Projected turning movement volumes were used along with adjacent developments' site-generated trips for the Build-Out Year 2025 and Horizon Year 2035 Background scenarios. The proposed development's site-generated trips were added to both Build-Out Year 2025 and Horizon Year 2035 Background scenarios to determine the Build-Out Year 2025 Full-Build and Horizon Year 2035 Full-Build scenarios.

Table 2: Yearly Growth Rates

Street	Segment Begin	Segment End	Direction	Period	MRCOG 2016 Model "Peak Hour Load"	MRCOG 2040 Model "Peak Hour Load"	Annual Growth Rate	Average Annual Growth	Growth Rate for Analysis
Universe Blvd	Volcano Vista High School Driveway	Woodmont Ave	NB	AM PH	213	281	1.17%	0.08%	1.00%
				PM PH	584	534	-0.37%		
	Woodmont Ave	Volcano Vista High School Driveway	SB	AM PH	555	479	-0.62%		
				PM PH	268	331	0.88%		
	Woodmont Ave	Oak Ridge St	NB	AM PH	143	184	1.05%		
				PM PH	380	309	-0.86%		
	Oak Ridge St	Woodmont Ave	SB	AM PH	367	272	-1.23%		
				PM PH	175	202	0.61%		
Unser Blvd	Rosa Parks Rd	Ave De Jaimito	NB	AM PH	373	527	1.45%	0.94%	1.00%
				PM PH	449	485	0.32%		
	Ave De Jaimito	Rosa Parks Rd	SB	AM PH	405	468	0.61%		
				PM PH	391	544	1.38%		
	Ave De Jaimito	South of Paseo Del Norte	NB	AM PH	373	527	1.45%		
				PM PH	449	485	0.32%		
	South of Paseo Del Norte	Ave De Jaimito	SB	AM PH	405	468	0.61%		
				PM PH	391	544	1.38%		
	North of Ave De Jaimito	Paseo Del Norte	NB	AM PH	373	527	1.45%		
				PM PH	449	485	0.32%		
	Paseo Del Norte	North of Ave De Jaimito	SB	AM PH	405	468	0.61%		
				PM PH	391	544	1.38%		
Paseo Del Norte	East of Unser Blvd	Unser Blvd	WB	AM PH	658	881	1.22%	1.17%	1.50%
				PM PH	1380	1709	0.89%		
	Unser Blvd	East of Unser Blvd	EB	AM PH	1239	1596	1.06%		
				PM PH	813	1118	1.34%		
	Unser Blvd	West of Unser Blvd	WB	AM PH	698	956	1.32%		
				PM PH	1405	1782	1.00%		
	West of Unser Blvd	Unser Blvd	EB	AM PH	1269	1658	1.12%		
				PM PH	851	1191	1.41%		

Source: MRCOG 2040 Trends

ADJACENT SITE TRIPS

Several adjacent developments have been approved for construction within the study area. The locations and number of lots for these adjacent developments were collected from relevant TIS. Trip generations were provided in the TIS for all of the adjacent developments. A study area map of the adjacent developments can be found in Figure 5. For the purposes of this analysis, adjacent developments with Build-Out Years of 2025 or earlier located within one mile of the subject study are anticipated for completion in 2025. The remaining adjacent developments anticipated to reach full completion by Horizon Year 2035 were not included in this study because growth factors developed from the MRCOG Regional Model have already captured trips that would be generated by these developments. The following adjacent developments were obtained from CABQ:

La Cuentista is a residential development with a total area of 59.08 acres located southeast of the Paseo Del Norte and Unser intersection in Albuquerque, New Mexico. The planned development consists of 244 single-family residential units with a completion year of 2024.

Sonata Apartments is a residential development located along the east side of Universe Boulevard, on the north and west sides of the subject study. The development consists of two phases. Phase 1 is proposed to contain 248 dwelling units with an opening year of 2022. The future phase includes 220 residential units; however, the timing of the future phase was not indicated in the TIS. Based on aerial imagery, Phase 1 of the Sonata Apartments development appears to be constructed but unoccupied. Therefore, trips generated by Phase 1 were included in this study for a conservative analysis. It should be noted that trips generated by the future phase were not included in this study.

Universe View Subdivision is a mixed-use development located on the northeast side of the intersection of Universe Boulevard and Rainbow Boulevard. The development consists of three phases. Phase I is proposed to contain 162 townhome units with an opening year of 2023. Phase II includes 196 apartment units and a gym with a completion year of 2025. Phase III consists of about 14,400 gross square feet of pharmacy without drive-through and 14,726 gross square feet of commercial building with an opening year of 2027. Since no construction was identified per aerial imagery, both Phase I and Phase II were included in this study for a conservative analysis. It should be noted that trips generated by Phase III were not included in this study.

Trips generated by the following developments were reviewed but not included as part of adjacent development trips in this study because their locations exceeded the one-mile threshold:

Thomas Development is a residential development with a total area of about 54 acres located southwest of the intersection of Paseo Del Norte and Woodmont/Ventana West Parkway. The development consists of 270 single-family residential units planned to be constructed by 2027.

Trails Tract 1 is a residential development with a total area of 13.76 acres located on the southwest corner of Paseo Del Norte and Woodmont Avenue. It is proposed to contain 333 multi-family residential units with a completion year of 2022. Based on aerial imagery, no sign of construction was identified.

Trails Tract 4 & 5 is a residential development with a total area of 37 acres located on the southeast corner of Paseo Del Norte and Woodmont Avenue. It is planned to include 344 single-family units with a completion year of 2025.

Qualified adjacent development site trips were distributed to and from intersections. A map showing the adjacent and proposed developments is provided in Figure 5. Figure 7 provides a composite of the site-generated trips from the three projects to be included as part of the 2025 and 2035 Background conditions.

Figure 5: Adjacent Development Map

XX (XX) AM (PM) Peak-Hour Volume

Intersection Approach Movement

Planned Roadways

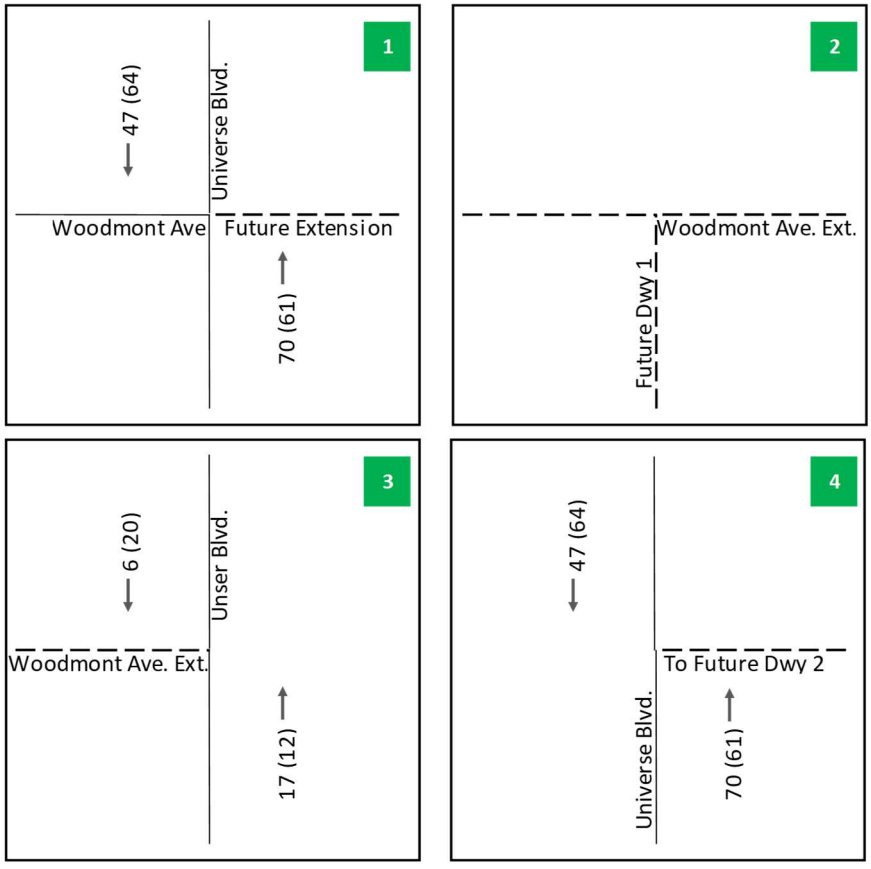


Figure 6: Adjacent Development Traffic Volumes, Composite of All Sites

SITE TRIP GENERATION

Trip generation for the Proposed Development was performed using the procedures and methodologies provided in the ITE Trip Generation Manual, 11th Edition. The land use category Single Family Detached (ITE 210), presented in Appendix C, was used to generate trips for the proposed development. Trips were calculated using the rate for Weekday AM and PM Peak Hour Traffic. Trips generated by the proposed development are shown below in Table 3. Site-generated trips were added to the Background traffic volumes to create the Total Build-Out and Horizon Year traffic volumes.

Table 3: Proposed Development Trip Generation

Use	Units		Weekday AM Peak Hour					Weekday PM Peak Hour				
			Total	Enter	Exit	In	Out	Total	Enter	Exit	In	Out
ITE 210 – Single Family Detached	235	Dwelling Units	162	26%	74%	42	120	222	63%	37%	140	82

TRIP DISTRIBUTION AND ASSIGNMENT

The proposed site-generated trip distribution was determined based on the analysis of existing intersection demand characteristics within the study area. These direct trips were routed within the roadway network to and from the Development based on the proportions of existing turning movement counts during the AM and PM peak hours. Figure 7 and Figure 8 show the routing percentages and trips generated by the Development in the Build-Out Year 2025.

XX% Inbound AM and PM Peak-Hour Trip Percentages

XX% Outbound AM and PM Peak-Hour Trip Percentages

Intersection Approach Movement

XX% Traffic Distribution

Planned Roadways

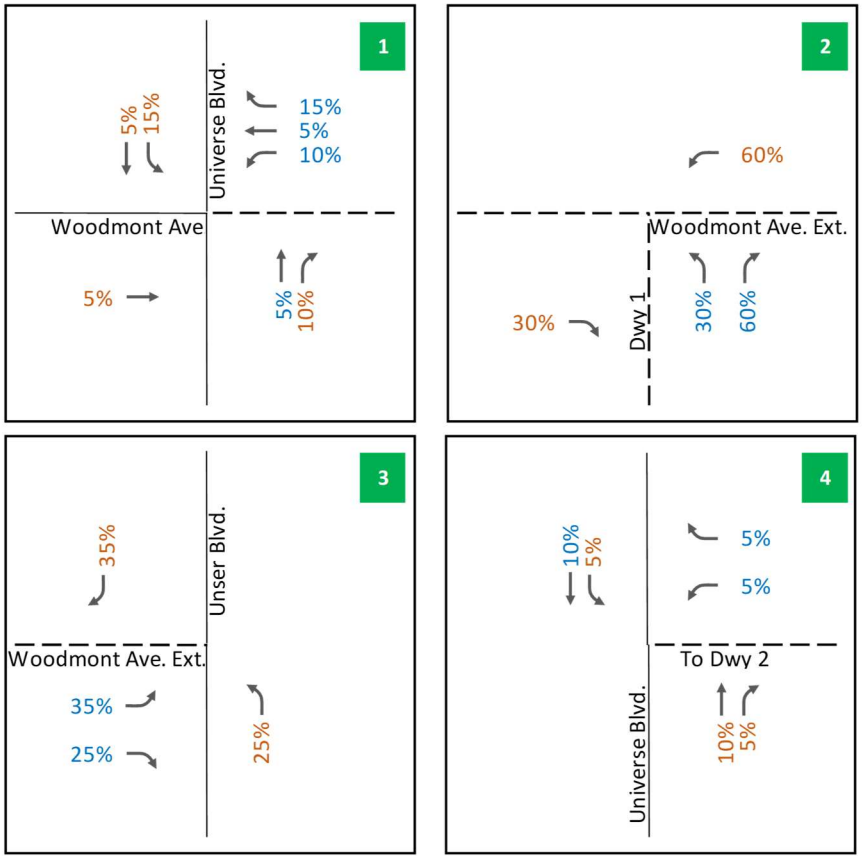


Figure 7: Site Generated Routing Percentages Build-Out Year 2025

XX (XX) AM (PM) Peak-Hour Volume

Intersection Approach Movement

Planned Roadways

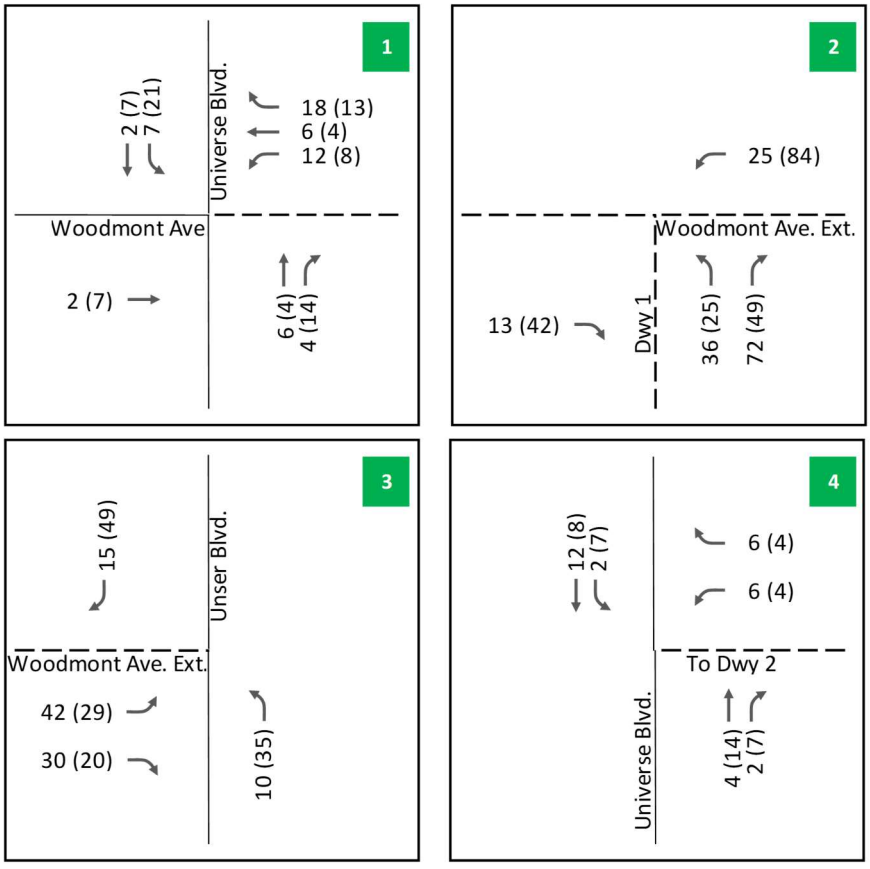


Figure 8: Site Generated Trips Build-Out Year 2025

Traffic Volume Calculations

Traffic volumes used in the Build-Out Year and Horizon Year analyses were calculated as follows:

- Build-Out Year 2025 Background – 2025 traffic volumes projected from the Existing traffic volumes via the application of a growth factor developed from the MRCOG Metropolitan Transportation Plan (MTP) CUBE/2 Regional Model plus trips generated by the adjacent developments.
- Build-Out Year 2025 Total – 2025 Background volumes plus trips generated by the proposed development.
- Horizon Year 2035 Background – 2035 traffic volumes projected from the Existing traffic volumes via the application of a growth factor developed from the MRCOG Metropolitan Transportation Plan (MTP) CUBE/2 Regional Model plus trips generated by the adjacent developments. It should be noted that only trips generated by adjacent developments with completion year of 2025 were included because growth factors developed from the MRCOG Regional Model have already captured trips that would be generated by future developments.
- Horizon Year 2035 Total – 2035 Background volumes plus trips generated by the proposed development.

Figure 9 shows the assumed lane configurations and traffic control for Build-Out and Horizon Year scenarios. Figures 10 through 13 show the volumes for each Build-Out and Horizon Year scenario.

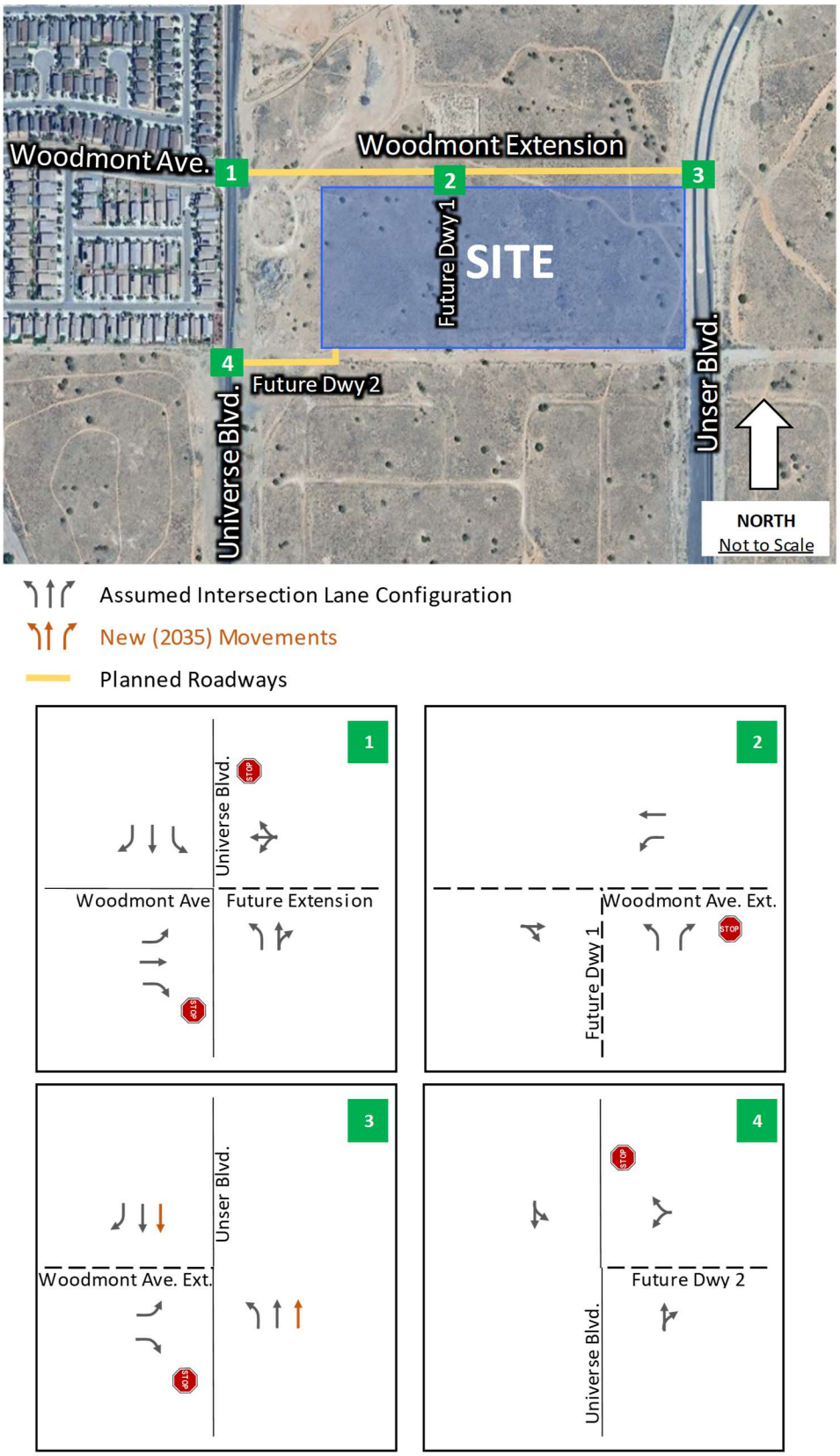


Figure 9: Assumed Lane Configurations and Traffic Control

XX (XX) AM (PM) Peak-Hour Volume

Intersection Approach Movement

Planned Roadways

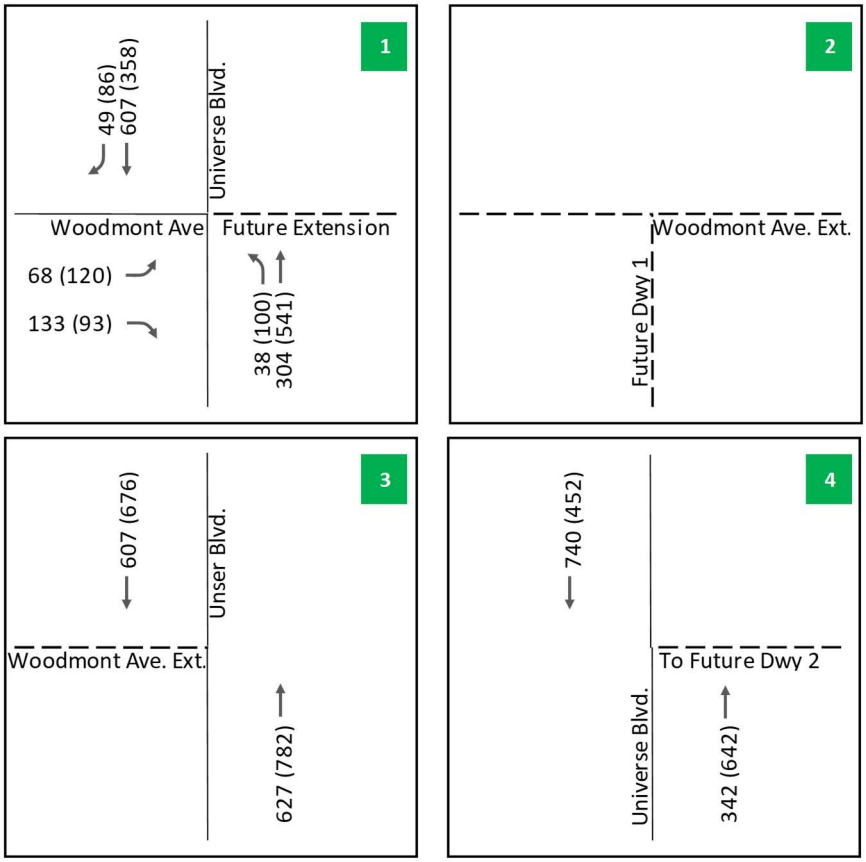


Figure 10: Build-Out Year 2025 Background Volumes

XX (XX) AM (PM) Peak-Hour Volume

Intersection Approach Movement

Planned Roadways

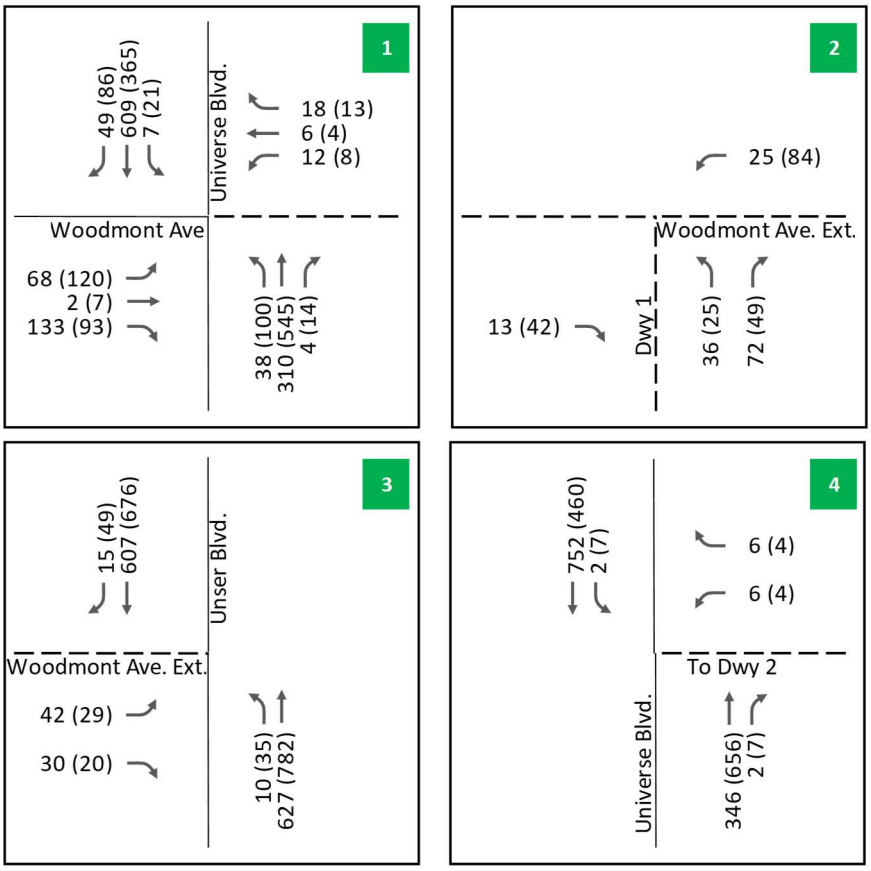


Figure 11: Build-Out Year 2025 Full-Build Volumes

XX (XX) AM (PM) Peak-Hour Volume

Intersection Approach Movement

Planned Roadways

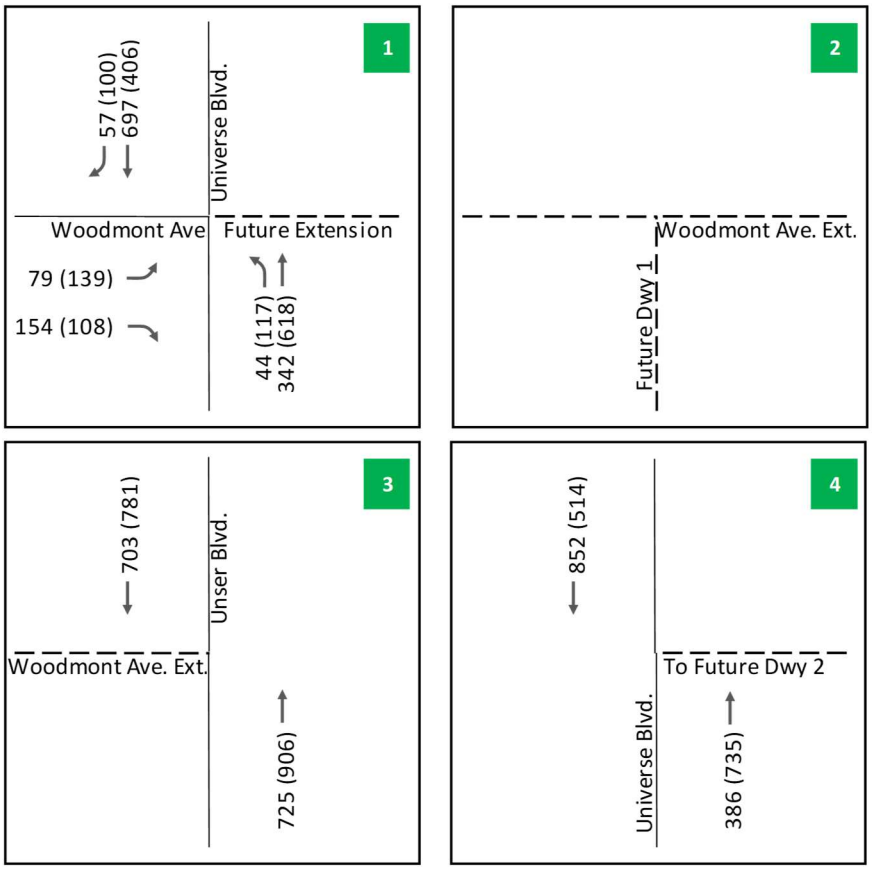


Figure 12: Horizon Year 2035 Background Volumes

XX (XX) AM (PM) Peak-Hour Volume

Intersection Approach Movement

Planned Roadways

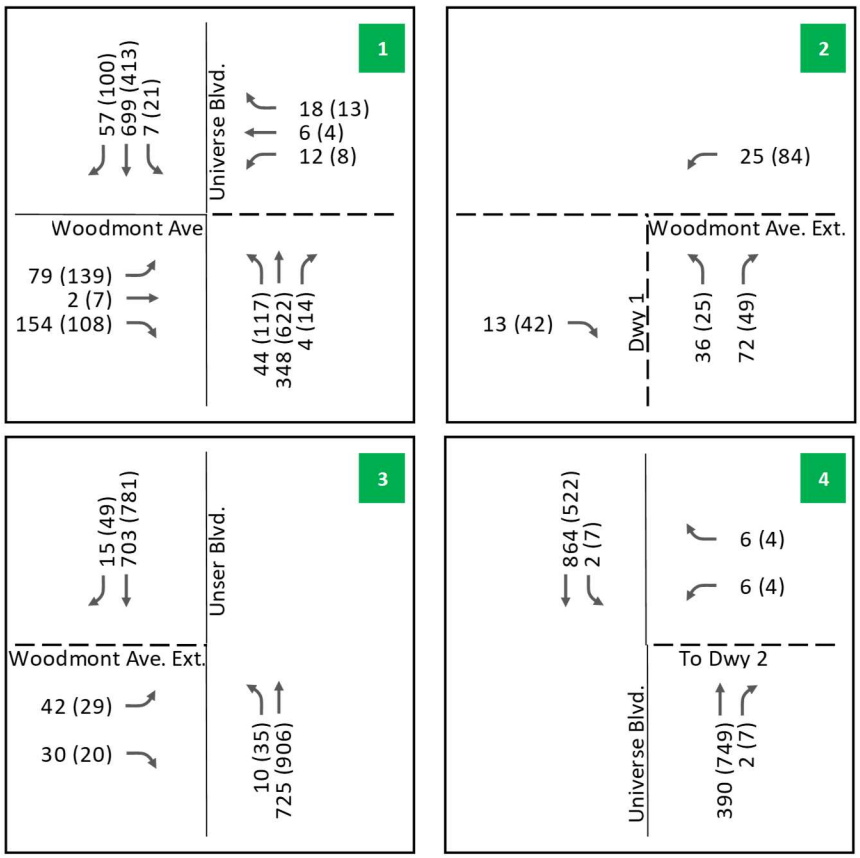


Figure 13: Horizon Year 2035 Full-Build Volume

SITE CONDITIONS AND SITE ANALYSIS

ASSUMPTIONS

The following assumptions regarding new developments in the roadway network were made for the Build-Out Year scenarios based on the information discussed in the scoping meeting:

- Woodmont Avenue will be extended east to intersect Unser Boulevard. According to the MRMPO *2040 Long Range Roadway System* and CABQ DPM Table 7.3.33, it is classified as a major collector consisting of one or two through lanes in each direction separated by a central left turn lane. For the purpose of this study, the roadway was assumed to be a two-lane roadway (one lane in each direction) with a speed limit of 35 mph. It should be noted that an eastbound through lane will be provided at the intersection of Woodmont Avenue and Universe Boulevard. Therefore, the existing eastbound continuous left-turn lane will become an eastbound left-turn lane with a storage lane.
- Universe Boulevard will remain as a two-lane undivided roadway consisting of one travel lane in each direction under Build-Out Year 2025 and Horizon Year 2035 conditions.
- Unser Boulevard will be a 4-lane divided roadway by the horizon year of 2035. The roadway was assumed to consist of 2 lanes in each direction separated by a raised median. The speed limit was assumed to be 35 mph. The assumed future cross-section of Unser Boulevard will be used for the Horizon Year 2035 Background and Total conditions.
- Driveway 1 on the extension of Woodmont Avenue will operate as a full-access driveway consisting of an outbound right-turn lane and an outbound left-turn lane.
- Driveway 2 on Universe Boulevard will operate as a full-access driveway consisting of an outbound shared right/left-turn lane.

SITE ACCESS ANALYSIS

Site access is to be provided via two driveways: one on the north side of the site accessing the extension of Woodmont Avenue and one on the west side of the site accessing Universe Boulevard. CABQ DPM requirements were reviewed for the two access driveways. CABQ DPM Table 7.4.45 provides a minimum distance between commercial site access points and intersections, and DPM Table 7.4.46 provides the maximum number of commercial site access points per site. The results of this analysis are shown in Table 4 below.

Table 4: Access Spacing Requirements from CABQ DPM

City of Albuquerque Development Process Manual Recommended Access Spacing							
Site Access	Major Street	Cross Street	Posted Speed	DPM Table 7.4.45 Minimum Distance Between Commercial Site Access and Intersection		DPM Table 7.4.46 Maximum Number of Commercial Site Access Points per Site	Distance Between Site Access Point and Intersection
				Approach Distance	Departure Distance		Approach Distance
Driveway 1	Woodmont Avenue Extension (Major Collector)	Unser Boulevard (Regional Principal Arterial) Universe Boulevard (Minor Arterial)	35	150 ft	150 ft	1 access point per 100 ft. frontage	> 700 ft
Driveway 2	Universe Boulevard (Minor Arterial)	Woodmont Avenue (Minor Arterial)	35	200 ft	150 ft	1-2 access points per 200 ft. frontage	575 ft

Per the information above, Driveway 1 on the extension of Woodmont Avenue and Driveway 2 on Universe Boulevard meet CABQ DPM access spacing requirements.

AUXILIARY LANE ANALYSIS

CABQ DPM auxiliary lane analysis warrants were reviewed for the site access driveways and study intersections. DPM Table 7.4.67 was used to determine if right or left-turn auxiliary lanes would be warranted for the study intersections. DPM Tables 7.4.68 and 7.4.70 were used to assess deceleration

and taper length, if applicable. It is important to note that Build-Out Year 2025 Full-Build traffic volumes were used in the analysis. The results of this analysis are shown in Table 5.

Table 5: Auxiliary Lane Warrants

Location	Turning Movement	Posted Speed (MPH)	DPM Table 7.4.67 Turning Volume per Hour	Turning Volume (vph) AM (PM)	Warrant Result	DPM Table 7.4.68 Minimum Storage Length (FT)	DPM Tables 7.4.68/70 Lane Transition Length (FT)
Universe Boulevard & Woodmont Avenue	NB Right	35	50	4 (14)	Not Required	-	-
	NB Left	35	40	38 (100)	Required	115*	300-150 Reverse Curve
	SB Right	35	50	49 (86)	Required	240	300-150 Reverse Curve
	SB Left	35	40	7 (21)	Not Required, but recommended	115*	300-150 Reverse Curve
	WB Right	35	50	18 (13)	Not Required	-	-
	WB Left	35	40	12 (8)	Not Required	-	-
	EB Right	35	50	133 (93)	Required	240	300-150 Reverse Curve
	EB Left	35	40	68 (120)	Required	345**	300-150 Reverse Curve
Unser Boulevard & Woodmont Avenue Extension	NB Left	35	40	10 (35)	Not Required, but recommended	115*	300-150 Reverse Curve
	SB Right	35	50	15 (49)	Not Required, but recommended	240	300-150 Reverse Curve
	EB Right	35	50	30 (20)	Not Required	-	-
	EB Left	35	40	42 (29)	Required	115*	300-150 Reverse Curve
Woodmont Avenue Extension & Driveway 1	WB Left	35	40	25 (84)	Required	115*	300-150 Reverse Curve
	EB Right	35	50	13 (42)	Not Required	-	-
Universe Boulevard & Driveway 2	NB Right	35	50	2 (7)	Not Required	-	-
	SB Left	35	40	2 (7)	Not Required	-	-

Notes:
* Breaking distance in feet with an assumption that vehicles slow down to 10 mph below the roadway speed limit before entering the auxiliary lane per *Arizona Department of Transportation Traffic Engineering Guidelines and Processes* Table 430-2.
** The 95th-percentile queue length, based on the Synchro model for the Build-Out Year 2025 Full-Build conditions.

It is recommended that all development driveways adhere to the auxiliary lane provisions detailed in the CABQ DPM Section 7-4(I)(7)(iii(d)). According to the city of Albuquerque criteria, the following auxiliary lanes and reconfigurations are recommended:

- Universe Boulevard and Woodmont Avenue
  - The existing eastbound approach should be re-striped / re-configured to have separate left / through / right lanes.
  - A southbound right-turn deceleration lane with a minimum storage length of 240 feet and a transition length of 300 feet with 150 feet of reverse curve.
  - A southbound left-turn deceleration lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of reverse curve because of high traffic volumes and speeds on Universe Boulevard.

- Unser Boulevard and Woodmont Avenue Extension
  - An eastbound left-turn deceleration lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of reverse curve.

- A southbound right-turn deceleration lane with a minimum storage length of 240 feet and a transition length of 300 feet with 150 feet of reverse curve because the PM peak-hour turning volume is just one vehicle less than the CABQ turn lane threshold. Additionally, Unser Boulevard is classified as a regional principal arterial, which is typically considered as a high-traffic volume roadway.
- A northbound left-turn deceleration lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of the reverse curve. The presence of a raised median on Unser Boulevard, the roadway classification, and the site plan indicated that a left-turn lane should be provided to accommodate future traffic entering the extension of Woodmont Avenue.

- Woodmont Avenue Extension and Driveway 1
  - A westbound left-turn deceleration lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of reverse curve.

It should also be noted that the minimum distance between the ends of adjacent median openings is 400 feet on minor arterials and principal arterials per CABQ DPM Figure 7.4.98.

Intersection Sight Distance

The following presents a narrative detailing the development's recommended intersection sight distance requirements. Intersection sight distance requirements for Driveway 1 and Driveway 2 were provided based on the CABQ DPM Section 7-4(I)(5)(iii) Table 7.4.65, while intersection sight distance requirements for the intersection of Unser Boulevard and extension of Woodmont Avenue were calculated based on the 2018 AASHTO "Green Book" chapter 9.5. Two sight distance cases were used for this analysis:

- Case B1 – A stopped vehicle turning left from a minor street approach onto a major road.
- Case B2 – A stopped vehicle turning right from a minor street approach onto a major road.

The intersection sight distance for Case B2 was calculated based on the assumption that the design vehicle turns into the nearest traffic lane. A single-passenger vehicle was used as the design vehicle. The required sight distance values provided in Table 6 are rounded up to the nearest 5-foot increment when applicable. Table 7.4.65, formulas, values, and calculations used in the sight distance analysis can be found in Appendix D. It should be noted that the Horizon Year 2035 roadway cross-sections were used for this analysis.

Table 6: Required Sight Distance Values

Access Location	Posted Speed Limit (MPH)	Assumed Cross-Section	Case	Required Sight Distance (FT)
Extension of Woodmont Avenue & Driveway 1	35	2 Lane Undivided	B1	390
			B2	340
Universe Boulevard & Driveway 2	35	2 Lane Undivided	B1	390
			B2	340
Unser Boulevard & Extension of Woodmont Avenue	35	4 Lane Divided with 14 feet Median	B1	465
			B2	335

Using the values shown above, all development driveways are recommended to adhere to the sight distance provisions detailed in the AASHTO "Green Book," and CABQ DPM Section 7-4(I)(5)(iii). An area bounded by the above sight distances with the decision point placed 15 feet back from the edge of the shoulder midway between the outbound driving lane should be maintained clear of any obstructions.

Site Access Recommendation

Trip generation and routing to and from the site would require two access points to prove adequate site circulation. The proposed site plan includes two access points: one on the north and one on the west of the site. Two site driveways are recommended to be full access to accommodate anticipated ingress and egress movements.

Access to Driveway 1 on the extension of Woodmont Avenue would be provided through either Unser or Universe Boulevard.

TRAFFIC ANALYSIS

The Synchro 12 traffic analysis software package was used to analyze each study intersection for LOS and queueing conditions using the methodology of the HCM 6th Edition. Detailed capacity output sheets showing all individual movements can be found in Appendix E.

LOS, Capacity, and Queuing Analysis

Per the Highway Capacity Manual (HCM), LOS is presented as a letter grade (A through F) based on the calculated average delay for an intersection or movement. Delay is calculated as a function of several variables, including signal phasing operations, cycle length, traffic volumes, and opposing traffic volumes, and is a measurement of the average wait time a driver can expect when moving through an intersection. Factors such as total cycle time (for all movements), queueing restrictions, and vehicle volumes can affect measurements of delay, especially for lower volume movements and side streets. Generally, these factors are only realized when delays reach or exceed LOS E thresholds. In such cases, a narrative is offered in subsequent sections specific to the individual movement in question.

Table 7 and Table 8 below, reproduced from the HCM, show delay thresholds and the associated LOS assigned to delay ranges for signalized intersections and stop controlled intersections, respectively. Generally, a LOS of D or better is considered an acceptable LOS.

Table 7: LOS Criteria and Descriptions for Signalized Intersections

Level of service	Average Control Delay (sec/vehicle)	General Description (Signalized Intersections)
A	≤10	Free flow
B	>10 – 20	Stable flow (slight delays)
C	>20 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F	>80	Forced flow (jammed)

Table 8: LOS Criteria for Unsignalized Intersections

Level of service	Average Control Delay (sec/vehicle)
A	≤10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F	>50

Queueing is reported in feet for all intersections with queue lengths greater than one vehicle, with a base assumption of 25 feet queue length per vehicle. Queues are reported for queue measurements falling within the 95th percentile. It should be noted that 95th-percentile queues are statistically expected to occur during only 5% of the peak hour's signal cycles. It is also noted that unreported average queueing at an intersection would statistically be much shorter than 95th-percentile queueing.

The volume-to-capacity (V/C) ratio is a performance measure that shows the ratio of traffic volume to the lane group capacity. A V/C ratio greater than 1.00 indicates that demand creates a residual queue for the analysis period.

For the purposes of this analysis, acceptable LOS are defined to be a LOS D or better. Based on procedures outlined in the HCM, intersection delay and LOS for stop-controlled intersections are reported as the delay and level of service for the worst-case movement at each intersection. For all other control types, they are taken for the whole intersection. Detailed output sheets can be found in Appendix E.

It should be noted that heavy vehicle percentages were assumed to be 2% for every movement for all scenarios. The existing intersection peak-hour factor (PHF) was calculated and used for all Synchro scenarios. PHF of 0.92 was also used for site driveways.

EXISTING YEAR 2024 CONDITIONS

Table 9 summarizes the intersection delay, level of service, and queueing under Existing Year 2024 conditions. The following conclusions are made from the Existing Conditions analysis:

Delay and LOS Results

At the stop-controlled intersection of Universe Boulevard and Woodmont Avenue, all movements currently operate at acceptable LOS during the AM and PM peaks except the EBL movement, which operates at LOS F with a V/C ratio of less than 1 during the PM peak hour.

Queuing Results

Queue length results indicated that existing storage lengths are sufficient to accommodate 95th-percentile queue lengths at the stop-controlled intersection of Universe Boulevard and Woodmont Avenue. Since Woodmont Avenue is a 4-lane roadway with 2 lanes in each direction consisting of one eastbound right-turn lane and one eastbound left-turn lane (no through lane) under the existing lane configuration, sufficient storage can be provided.

Table 9: Intersection Capacity Analysis Summary for Existing (2024) Conditions

Universe Blvd. & Woodmont Ave. (Stop-Controlled)																	
AM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	PM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS
	EBL	<50	-	0.27	22.8	C	3.6	-		EBL	185	-	0.98	125.2	F	14.5	-
	EBR	<50	-	0.29	15.5	C				EBR	<50	-	0.19	12.1	B		
	NBL	<50	300	0.04	9.0	A				NBL	<50	300	0.12	8.8	A		

BUILD-OUT YEAR (2025) BACKGROUND CONDITIONS

Table 10 summarizes the intersection delay, level of service, and queueing under Build-Out Year 2025 Background conditions. The following conclusions are made for the Build-Out Year Background analysis:

Delay and LOS Results

At the stop-controlled intersection of Universe Boulevard and Woodmont Avenue, all movements are expected to operate at acceptable LOS during the AM and PM peaks except the EBL movement, which is expected to operate at LOS F, similar to the existing conditions, with a V/C ratio of greater than 1 during the PM peak hour.

Queuing Results

Queue length results indicated that existing storage lengths are sufficient to accommodate 95th-percentile queue lengths at the stop-controlled intersection of Universe Boulevard and Woodmont Avenue. Since Woodmont Avenue is a 4-lane roadway with 2 lanes in each direction consisting of one eastbound right-turn lane and one eastbound left-turn lane (no through lane) under the 2025 background (no build-out) lane configuration, sufficient storage still can be provided.

Table 10: Intersection Capacity Analysis Summary for Build-Out Year (2025) Background Conditions

Universe Blvd. & Woodmont Ave. (Stop-Controlled)																	
AM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	PM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS
	EBL	<50	-	0.33	28.8	D	3.8	-		EBL	257	-	1.31	255.5	F	25.3	-
	EBR	<50	-	0.32	16.9	C				EBR	<50	-	0.22	13.3	B		
	NBL	<50	300	0.05	9.3	A				NBL	<50	300	0.13	9.2	A		

BUILD-OUT YEAR (2025) FULL-BUILD CONDITIONS

Table 11 summarizes the intersection delay, level of service, and queueing under Build-Out Year 2025 Full-Build conditions. The following conclusions are made for the Build-Out Year 2025 Full-Build analysis:

Delay and LOS Results

At all intersections where LOS results are present, all movements are expected to operate at acceptable LOS during the AM and PM peaks except:

- At the stop-controlled intersection of Universe Boulevard and Woodmont Avenue
  - EBL movement is expected to operate at LOS E with a V/C ratio of less than 1 during the AM peak hour.

- EBL movement is expected to operate at LOS F with a V/C ratio of greater than 1 and a delay of 566.7 seconds during the PM peak hour.
- EBT movement and the westbound approach are expected to operate below LOS D with V/C ratios of less than 1 during the PM peak hour.

- At the stop-controlled intersection of Unser Boulevard and the extension of Woodmont Avenue
  - EBL movement is expected to operate at LOS E with a V/C ratio of less than 1 during the PM peak hour.

Queuing Results

At all intersections where queue length results are present, storage lengths are sufficient to accommodate 95th-percentile queue lengths during the AM and PM peaks except:

- At the stop-controlled intersection of Universe Boulevard and Woodmont Avenue
  - EBL movement is expected not to accommodate 95th-percentile queue lengths during the PM peak hour.

Table 11: Intersection Capacity Analysis Summary for Build-Out Year (2025) Full-Build Conditions

Universe Blvd. & Woodmont Ave. (Stop-Controlled)																		
AM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	PM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS
	EBL	50	180	0.44	41.9	E	5.1	-		EBL	345	180	1.97	566.7	F	52.2	-
	EBT	<50	-	0.01	23.1	C				EBT	<50	-	0.09	44.1	E		
	EBR	<50	-	0.31	16.3	C				EBR	<50	-	0.21	12.7	B		
	WBR/T/L	<50	-	0.19	25.9	D				WBR/T/L	<50	-	0.30	50.9	F		
	NBL	<50	300	0.05	9.3	A				NBL	<50	300	0.13	9.2	A		
	SBL	<50	265	0.01	8.0	A				SBL	<50	265	0.03	9.2	A		
Unser Blvd. & Extension of Woodmont Ave. (Stop-Controlled)																		
AM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	PM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS
	EBL	<50	265	0.26	33.2	D	1.4	-		EBL	<50	265	0.26	46.5	E	1.2	-
	EBR	<50	-	0.07	13.1	B				EBR	<50	-	0.05	13.6	B		
	NBL	<50	265	0.01	8.9	A				NBL	<50	265	0.04	9.4	A		
Extension of Woodmont Ave. & Driveway 1 (Stop-Controlled)																		
AM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	PM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS
	NBL	<50	-	0.04	9.0	A	7.7	-		NBL	<50	-	0.04	10.1	B	6.5	-
	NBR	<50	-	0.07	8.6	A				NBR	<50	-	0.05	8.6	A		
	WBL	<50	265	0.02	7.3	A				WBL	<50	265	0.06	7.4	A		
Universe Blvd. & Driveway 2 (Stop-Controlled)																		
AM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	PM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS
	WBL/R	<50	-	0.04	17.0	C	0.2	-		WBL/R	<50	-	0.03	19.0	C	0.2	-
	SBL	<50	-	0.0	8.1	A				SBL	<50	-	0.01	9.1	A		

HORIZON YEAR (2035) BACKGROUND CONDITIONS

Table 12 summarizes the intersection delay, level of service, and queueing under Horizon Year 2035 Background conditions. The following conclusions are made for the Horizon Year 2035 Background analysis:

Delay and LOS Results

At the stop-controlled intersection of Universe Boulevard and Woodmont Avenue, all movements are expected to operate at acceptable LOS during the AM and PM peaks except the EBL movement, which is expected to operate at LOS F during both peak hours. A review of the V/C ratio indicated that a V/C ratio of less than 1 during the AM peak hour and greater than 1 during the PM peak hour are expected for the EBL movement.

Queuing Results

Queue length results indicated that storage lengths are sufficient to accommodate 95th-percentile queue lengths at the stop-controlled intersection of Universe Boulevard and Woodmont Avenue except for the EBL movement during the PM peak hour.

Table 12: Intersection Capacity Analysis Summary for Horizon Year (2035) Background Conditions

Universe Blvd. & Woodmont Ave. (Stop-Controlled)																		
	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS		Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS
AM Peak	EBL	75	180	0.58	58.5	F	5.9	-	PM Peak	EBL	438	180	2.54	825.2	F	78.8	-
	EBT	<50	-	0.00	0.0	A				EBT	<50	-	0.00	0.0	A		
	EBR	50	-	0.41	19.9	C				EBR	<50	-	0.26	13.8	B		
	WBR/T/L	<50	-	0.00	0.0	A				WBR/T/L	<50	-	0.00	0.0	A		
	NBL	<50	300	0.06	9.7	A				NBL	<50	300	0.16	9.6	A		
	SBL	<50	265	0.00	0.0	A				SBL	<50	265	0.00	0.0	A		

HORIZON YEAR (2035) TOTAL CONDITIONS

Table 13 summarizes the intersection delay, level of service, and queueing under Horizon Year 2035 Full-Build conditions. The following conclusions are made for the Horizon Year analysis:

Delay and LOS Results

At all intersections where LOS results are present, all movements operate at acceptable LOS during the AM and PM peaks except:

- At the stop-controlled intersection of Universe Boulevard and Woodmont Avenue
  - EBL movement and westbound approach are expected to operate below LOS D with V/C ratios of less than 1 during the AM peak hour.
  - EBL movement is expected to operate at LOS F with a V/C ratio greater than 1 and a delay of greater than 16 minutes during the PM peak hour.
  - EBT movement and the westbound approach are expected to operate at LOS F with V/C ratios of less than 1 during the PM peak hour.
- At the stop-controlled intersection of Unser Boulevard and the extension of Woodmont Avenue
  - EBL movement is expected to operate at LOS E with a V/C ratio of less than 1 during the PM peak hour.

Queuing Results

At all intersections where queue length results are present, storage lengths are sufficient to accommodate 95th-percentile queue lengths during the AM and PM peaks except:

- At the stop-controlled intersection of Universe Boulevard and Woodmont Avenue
  - EBL movement is expected not to accommodate 95th-percentile queue lengths during the PM peak hour.

Table 13: Intersection Capacity Analysis Summary for Horizon Year (2035) Full-Build Conditions

Universe Blvd. & Woodmont Ave. (Stop-Controlled)																	
AM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	PM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS
	EBL	90	180	0.66	74.9	F	7.6	-		EBL	485	180	3.41	>1000	F	114	-
	EBT	<50	-	0.01	27.7	D				EBT	<50	-	0.13	62.1	F		
	EBR	50	-	0.41	19.9	C				EBR	<50	-	0.26	13.9	B		
	WBR/T/L	<50	-	0.26	37.8	E				WBR/T/L	<50	-	0.45	89.0	F		
	NBL	<50	300	0.06	9.7	A				NBL	<50	300	0.17	9.7	A		
	SBL	<50	265	0.01	8.1	A				SBL	<50	265	0.03	9.6	A		
Unser Blvd. & Extension of Woodmont Ave. (Stop-Controlled)																	
AM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	PM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS
	EBL	<50	265	0.23	29.6	D	1.1	-		EBL	<50	265	0.22	38.8	E	0.9	-
	EBR	<50	-	0.05	11.0	B				EBR	<50	-	0.40	11.2	B		
	NBL	<50	265	0.01	9.3	A				NBL	<50	265	0.05	9.8	A		
Extension of Woodmont Ave. & Driveway 1 (Stop-Controlled)																	
AM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	PM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS
	NBL	<50	-	0.04	9.0	A	7.7	-		NBL	<50	-	0.04	10.1	B	6.5	-
	NBR	<50	-	0.07	8.6	A				NBR	<50	-	0.05	8.6	A		
	WBL	<50	265	0.02	7.3	A				WBL	<50	265	0.06	7.4	A		
Universe Blvd. & Driveway 2 (Stop-Controlled)																	
AM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	PM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS
	WBL/R	<50	-	0.05	19.8	C	0.2	-		WBL/R	<50	-	0.04	22.4	C	0.2	-
	SBL	<50	-	0.0	8.2	A				SBL	<50	-	0.01	9.5	A		

CAPACITY MITIGATIONS

UNIVERSE BOULEVARD AND WOODMONT AVENUE MITIGATIONS

The stop-controlled intersection of Universe Boulevard and Woodmont Avenue is expected to experience capacity and queueing issues in the Existing, Background, Full Build, and Horizon scenarios. It is recommended that a new traffic signal be installed to resolve these issues. Table 14 summarizes the intersection delay, level of service, and queueing under the Horizon Year 2035 Full Build with mitigations. The following conclusions are made for the Mitigated analysis:

Delay and LOS Results

At the signalized intersection of Universe Boulevard and Woodmont Avenue, all movements are expected to operate at LOS C or better during the AM and PM peak hours.

Queuing Results

Queue length results indicated that existing and recommended storage lengths are sufficient to accommodate 95th-percentile queue lengths at the signalized intersection of Universe Boulevard and Woodmont Avenue.

Table 14: Universe Boulevard and Woodmont Avenue Summary with Mitigations

Universe Blvd. & Woodmont Ave. (Signalized)																	
AM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	PM Peak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	V/C	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS
	EBL	58	180	0.26	18.4	B	8.3	A		EBL	90	180	0.55	25.1	C	11.8	B
	EBT	<50	-	0.00	16.5	B				EBT	<50	-	0.02	16.6	B		
	EBR	<50	-	0.32	5.9	A				EBR	<50	-	0.29	5.8	A		
	WBR/T/L	<50	-	0.10	11.9	B				WBR/T/L	<50	-	0.08	12.0	B		
	NBL	<50	300	0.15	6.0	A				NBL	<50	300	0.36	9.0	A		
	NBT/R	89	-	0.32	5.8	A				NBT/R	233	-	0.76	14.3	B		
	SBL	<50	265	0.01	4.1	A				SBL	<50	265	0.13	7.1	A		
	SBT	237	-	0.63	9.5	A				SBT	126	-	0.49	8.5	A		
	SBR	<50	390	0.06	1.6	A				SBR	<50	390	0.13	1.6	A		

Since the proposed development contributes averaged 4.79% of the total Build-Out Year 2025 Full-Build and Horizon Year 2035 Full-Build traffic volumes during the AM and PM peak hours as shown in Table 15, the developer should be responsible for only 4.79% of the recommended mitigations.

Table 15: Fair Share Calculations for the Intersection of Universe Boulevard and Woodmont Avenue

2025 non-site Peak-Hour Volumes		2035 non-site Peak-Hour Volumes		Site Peak-Hour Volumes	
AM	PM	AM	PM	AM	PM
1,199	1,298	1,373	1,488	57	78
				Percentages of Contribution	
				AM	PM
Percentages of 2025 Site Traffic Contribution				4.54%	5.67%
Percentages of 2035 Site Traffic Contribution				3.99%	4.98%
Averaged Percentages of Site Traffic Contribution				**4.79%**	

The *Manual on Uniform Traffic Control Devices* (MUTCD) Section 4C.01 paragraph 11 states:

> *"At a location that is under development or construction and where it is not possible to obtain a traffic count that would represent future traffic conditions, hourly volumes should be estimated as part of an engineering study for comparison with traffic signal warrants. Except for locations where the engineering study uses the satisfaction of Warrant 8 to justify a signal, a traffic control signal installed under projected conditions should have an engineering study done within 1 year of putting the signal into stop-and-go operation to determine if the signal is justified. If not justified, the signal should be taken out of stop-and-go operation or removed."*

Therefore, an assumed signalized intersection of Universe Boulevard and Woodmont Avenue was only evaluated as part of the planning study in this report to mitigate poor LOS at this intersection. If installed, a formal signal warrant analysis should be completed within one year of the development's completed construction.

CRASH DATA SUMMARY

At the request of the City of Albuquerque, a crash summary for the study intersections has been completed. The purpose of this analysis is to highlight trends and observations from summarized crash data. Crash data was provided by the New Mexico Department of Transportation (NMDOT) for the years 2018 to 2022 in aggregate form and is summarized in Table 16.

From the table below, the following observations are made:

- For the intersection of Universe Boulevard and Woodmont Avenue
  - Within the years 2018 to 2022, 3 crashes were reported, an average of 0.6 crashes per year.
  - Crash types consisted of Other Vehicle – One Left Turn/ Entering At Angle and Other Vehicle – From Same Direction/Sideswipe Collision.
  - 100% of reported crashes occurred during daylight hours.
  - No fatal crashes were reported from 2018 to 2022.
  - 3 injury crashes were reported.

- Contributing factors consisted of Failed To Yield, Driver Inattention, Under The Influence, and Other.
- No pedestrian or bicyclist-involved crashes were reported from 2018 to 2022.

- For the intersection of Unser Boulevard and Ave De Jaimito (About 500 south of the future extension of Woodmont Avenue)
  - Within the years 2018 to 2022, 2 crashes were reported, an average of 0.4 crashes per year.
  - Crash type indicated as “Left Blank”.
  - 100% of reported crashes occurred during daylight hours.
  - No fatal crashes were reported from 2018 to 2022.
  - 2 injury crashes were reported.
  - Contributing factors consisted of Driver Inattention, Following Too Closely, and Other.
  - No pedestrian or bicyclist-involved crashes were reported from 2018 to 2022.

Table 16: Crash Summary

Crash Summary		Universe Blvd. & Woodmont Ave.	Unser Blvd. & Ave De Jaimito
Total Crashes		**3**	**2**
Year	2018	1	0
	2019	1	0
	2020	0	1
	2021	1	1
	2022	0	0
Crash Type	Left Blank	1	2
	Fixed Object	0	0
	Collision With Animal	0	0
	Other Vehicle - From Opposite Direction/Sideswipe Collision	0	0
	Other Vehicle - From Same Direction/One Left Turn	0	0
	Other Vehicle - From Same Direction/Rear End Collision	0	0
	Other Vehicle - From Same Direction/Sideswipe Collision	1	0
	Other Vehicle - From Same Direction/Vehicle Backing	0	0
	Other Vehicle - One Left Turn/Entering At Angle	1	0
	%Other Vehicle - One Left Turn/Entering At Angle	33%	0%
	%Left Blank	33%	100%
Lighting Conditions	Daylight	3	2
	Dark-Lighted	0	0
	Dark-Not Lighted	0	0
	%Daylight	100%	100%
	%Dark-Not Lighted	0%	0%
Severity	Fatal Crash (K)	0	0
	Suspected Serious Injury (A)	0	0
	Suspected Minor Injury (B)	2	1
	Complaint of Injury (C)	1	1
	Property Damage Only Crash (D)	0	0
	%Injury Crash	100%	100%
	%Property Damage Only Crash	0%	0%
Bike/Ped Involvement	Pedestrian Involved	0	0
	Pedalcycle Involved	0	0
	%Pedestrian Involved	0%	0%
	%Pedalcycle Involved	0%	0%
Contributing Factors	Under The Influence	1	0
	Failed To Yield	2	0
	Driver Inattention	1	2
	Following Too Closely	0	1
	None	2	0
	Other Mechanical Defect	1	0
	Other	1	2
	%Failed To Yield	67%	0%
	%Driver Inattention	33%	100%
	%None	67%	0%

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Traffic operations for the Existing scenario are summarized as follows:

- Universe Boulevard and Woodmont Avenue
  - All movements currently operate at acceptable LOS during the AM and PM peaks except the EBL movement, which operates at LOS F with a V/C ratio of less than 1 during the PM peak hour.
  - The existing storage lengths are sufficient to accommodate 95th-percentile queue lengths.

Traffic operations for the Build-Out Year 2025 Background scenario are summarized as follows:

- Universe Boulevard and Woodmont Avenue
  - All movements are expected to operate at acceptable LOS during the AM and PM peaks except the EBL movement, which is expected to operate at LOS F, similar to the existing conditions, with a V/C ratio of greater than 1 during the PM peak hour.
  - The existing storage lengths are sufficient to accommodate 95th-percentile queue lengths.

Traffic operations for the Build-Out Year 2025 Full-Build scenario are summarized as follows:

- Universe Boulevard and Woodmont Avenue
  - EBL movement is expected to operate at LOS E with a V/C ratio of less than 1 during the AM peak hour.
  - EBL movement is expected to operate at LOS F with a V/C ratio of greater than 1 and a delay of 566.7 seconds during the PM peak hour.
  - EBT movement and the westbound approach are expected to operate below LOS D with V/C ratios of less than 1 during the PM peak hour.
  - All other movements are expected to operate at acceptable LOS.
  - EBL movement is expected not to accommodate 95th-percentile queue lengths during the PM peak hour.
  - All other storage lengths are sufficient to accommodate 95th-percentile queue lengths during the AM and PM peak hours.

- Unser Boulevard and the extension of Woodmont Avenue
  - EBL movement is expected to operate at LOS E with a V/C ratio of less than 1 during the PM peak hour.
  - All other movements are expected to operate at acceptable LOS.

- The extension of Woodmont Avenue and Driveway 1
  - All movements are expected to operate at LOS B or better.

- Universe Boulevard and Driveway 2
  - All movements are expected to operate at LOS C or better.

Traffic operations for the Horizon Year 2035 Background scenario are summarized as follows:

- Universe Boulevard and Woodmont Avenue
    - All movements are expected to operate at acceptable LOS during the AM and PM peaks except the EBL movement, which is expected to operate at LOS F during both peak hours. A review of the V/C ratio indicated that a V/C ratio of less than 1 during the AM peak hour and greater than 1 during the PM peak hour are expected for the EBL movement.
    - The storage lengths are sufficient to accommodate 95th-percentile queue lengths except for the EBL movement during the PM peak hour.

Traffic operations for the Horizon Year 2035 Full-Build scenario are summarized as follows:

- Universe Boulevard and Woodmont Avenue
    - EBL movement and westbound approach are expected to operate below LOS D with V/C ratios of less than 1 during the AM peak hour.
    - EBL movement is expected to operate at LOS F with a V/C ratio greater than 1 and a delay of greater than 16 minutes during the PM peak hour.
    - EBT movement and the westbound approach are expected to operate at LOS F with V/C ratios of less than 1 during the PM peak hour.
    - EBL movement is expected not to accommodate 95th-percentile queue lengths during the PM peak hour.
    - All other storage lengths are expected to be sufficient to accommodate 95th-percentile queue lengths during the AM and PM peak hours.

- Unser Boulevard and the extension of Woodmont Avenue
    - EBL movement is expected to operate at LOS E with a V/C ratio of less than 1 during the PM peak hour.
    - All other movements are expected to operate at acceptable LOS.

- The extension of Woodmont Avenue and Driveway 1
    - All movements are expected to operate at LOS B or better.

- Universe Boulevard and Driveway 2
    - All movements are expected to operate at LOS C or better.

SITE RECOMMENDATIONS

Recommendations for study intersections directly serving and primarily impacted by the proposed development are provided as follows:

- Universe Boulevard and Woodmont Avenue
    - A southbound left-turn deceleration lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of reverse curve is recommended.

- Unser Boulevard and Woodmont Avenue Extension
    - An eastbound left-turn deceleration lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of reverse curve is recommended.
    - A northbound left-turn deceleration lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of the reverse curve is recommended.

- A southbound right-turn deceleration lane with a minimum storage length of 240 feet and a transition length of 300 feet with 150 feet of reverse curve is recommended.

- Woodmont Avenue Extension and Driveway 1
  - A westbound left-turn lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of the reverse curve is recommended.

OFF-SITE INTERSECTION RECOMMENDATIONS

Recommendations for intersections within the study area that do not directly serve the proposed development and are impacted by multiple developments in the area are provided as follows:

- Universe Boulevard and Woodmont Avenue
  - A southbound right-turn lane with a minimum storage length of 240 feet and a transition length of 300 feet with 150 feet of reverse curve is recommended.
  - The eastbound approach should be re-striped / re-configured with left / through / right lane assignments.
  - Installing a signal traffic control would mitigate poor LOS per Synchro analysis. If installed, a formal signal warrant analysis should be completed within one year of the development's completed construction. It should be noted that the Synchro results show that all movements are expected to operate at acceptable LOS during peak hours. Additionally, the Synchro results indicate that the existing eastbound left-turn deceleration lane with a storage length of 180 feet is expected to be sufficient to accommodate 95th-percentile queue lengths during peak hours under the mitigation scenario.
  - The proposed development contributes averaged 4.79% of the total Build-Out Year 2025 Full-Build and Horizon Year 2035 Full-Build traffic volumes during the AM and PM peak hours.

APPENDIX A SCOPING MEETING NOTES

Agenda for JLM Living - Scoping Meeting
Southeast Corner of Universe Blvd. and Woodmont Ave.
April 23, 2024
-Meeting Notes in Red-

Attendees:

Curtis Cherne – City of Albuquerque
Matt Grush – City of Albuquerque
Jonathon Kruse – Lee Engineering
Brad Sumrall – Cobb Fendley
Rembrandt Fernandez – Cobb Fendley

1. Introductions
2. Review of Site Plan
    a. Site Plan & Land Uses
    b. Access Review
        i. Note Unser controlled by MRCOG RACC. Project team is working with CABQ to vacate ROW on Avenida De Jaimito and to dedicate ROW for Woodmont Ave.
        ii. Align Woodmont as close to straight as possible.
        iii. Study queueing at Universe & Woodmont for alignment.
        iv. Secondary access to Universe check spacing in DPM.
3. Discussion of Scope for TIS
    a. Study Intersections
        i. Unser & Woodmont
        ii. Universe & Woodmont
        iii. Site driveways
            1. Woodmont
            2. Universe
    b. Data Collection
        i. Existing Study Intersections (9-hour turning movement counts)
    c. Trip Generation, Pass By, & Internal Capture
        i. Trip Generation Manual (11th Edition) Land Use
            1. ITE 220 – Multifamily – (Low-Rise)
            2. Trip Generation
            3. Use single family detached.

JLM Living - Residential						
Land Use: (#220) Multifamily Housing (Low-Rise)						
# of Units	Daily		AM Peak Roadway		PM Peak Roadway	
235	Enter	Exit	Enter	Exit	Enter	Exit
Dir. Dist.	50%	50%	24%	76%	63%	37%
Trips	791	791	23	73	77	45
	1582		96		122	

All Units		
# of Trips	Equation	
Daily	1582.0	T = 6.41 (X) +75.31
AM Pk	96.0	T = 0.31 (X) + 22.85
PM Pk	122.0	T = 0.43 (X) + 20.55

Source: ITE Trip Generation, 11th Edition

JLM Living - Residential						
Land Use: (#210) Single Family Detached						
# of Units	Daily		AM Peak Roadway		PM Peak Roadway	
235	Enter	Exit	Enter	Exit	Enter	Exit
Dir. Dist.	50%	50%	26%	74%	63%	37%
Trips	1108	1108	42	120	140	82
	2216		162		222	

All Units		
# of Trips	Equation	
Daily	2216.0	Ln (T) = 0.92 Ln (X) + 2.68
AM Pk	162.0	Ln (T) = 0.91 Ln (X) + 0.12
PM Pk	222.0	Ln (T) = 0.94 Ln (X) + 0.27

Source: ITE Trip Generation, 11th Edition

ii. No Pass-by/Diverted trips
iii. No Internal Capture
iv. Trips distributed based on existing traffic patterns

d. Known Developments or Pending Improvements in Area
   i. Paseo / Unser Project
   ii. Developments south side of paseo near Ventana Ranch. Matt to send reports.
e. Build-out Year and Growth Rate
   i. Build-Out Year (2025)
      1. Will look at Historic Traffic Volumes and calculate growth rate, if less than 1%, will assume 1% growth per year.
f. Analysis scenarios
   i. Existing Conditions
   ii. Opening Year Background (No Build)
   iii. Opening Year Buildout (Full Build)
   iv. Opening Year Buildout Optimized (if needed)
      1. All scenarios with existing signal timings except opening year buildout optimized.
   v. Horizon year – 10 Years from opening (2035)
      1. Work with MRCOG to add Woodmont Link
g. Required Analysis & Methodology
   i. LOS Capacity and Queueing analysis based on HCM 6th Edition (Using Synchro)
      1. Capacity & Queueing for network peak rather than individual intersection peaks
   ii. No Arterial Analysis.
   iii. Auxiliary Lane Analysis
   iv. Sight Distance Analysis at Proposed Driveways
   v. Safety (Crash) Summary for the most recent available 5-year period

4. Agency Input (Comments & Issues)
5. Meeting Notes (distributed by Lee Engineering)

APPENDIX B TURNING MOVEMENT COUNTS

Woodmont Avenue and Universe Boulevard

TOTAL

Date	Time	Southbound						Westbound						Northbound						Eastbound					
		U Turns	Left Turns	Straight Through	Right Turns	EB Crosswalk Crossings	WB Crosswalk Crossings	U Turns	Left Turns	Straight Through	Right Turns	NB Crosswalk Crossings	SB Crosswalk Crossings	U Turns	Left Turns	Straight Through	Right Turns	EB Crosswalk Crossings	WB Crosswalk Crossings	U Turns	Left Turns	Straight Through	Right Turns	NB Crosswalk Crossings	SB Crosswalk Crossings
5/2/2024	6:00	0	0	40	1	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	6	0	6	0	0
	6:15	0	0	61	2	0	0	0	0	0	0	0	0	0	1	10	0	0	0	0	14	0	4	0	0
	6:30	0	0	87	2	0	0	0	0	0	0	0	0	0	6	15	0	0	0	0	9	0	9	0	0
	6:45	0	0	99	3	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	15	0	12	0	0
	7:00	0	0	141	8	0	0	0	0	0	0	0	0	0	6	23	0	0	0	0	19	0	31	0	0
	7:15	0	0	169	12	0	0	0	0	0	0	0	0	0	3	49	0	0	0	0	16	0	19	0	0
	7:30	0	0	129	4	0	0	0	0	0	0	0	0	0	2	60	0	0	0	0	22	0	22	0	0
	7:45	0	0	130	7	0	0	0	0	0	0	0	0	0	5	70	0	0	0	0	13	0	12	0	0
	8:00	0	0	136	12	0	0	0	0	0	0	0	0	0	6	58	0	0	0	0	16	0	20	0	0
	8:15	0	0	156	12	0	0	0	0	0	0	0	0	0	10	49	0	0	0	0	16	0	47	0	0
	8:30	0	0	130	17	0	0	0	0	0	0	0	0	0	16	54	0	0	0	0	22	0	52	0	0
	8:45	0	0	62	20	0	0	0	0	0	0	0	0	0	8	42	0	0	0	0	22	0	14	0	0
	9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	11:00	0	0	39	2	0	0	0	0	0	0	0	0	0	6	15	0	0	0	0	6	0	6	0	0
	11:15	0	0	33	8	0	0	0	0	0	0	0	0	0	4	23	0	0	0	0	9	0	5	0	0
	11:30	0	0	37	9	0	0	0	0	0	0	0	0	0	0	24	0	0	0	0	15	0	6	0	0
	11:45	0	0	35	6	0	0	0	0	0	0	0	0	0	4	32	0	0	0	0	9	0	2	1	1
	12:00	0	0	29	6	0	0	0	0	0	0	0	0	0	5	39	0	0	0	0	12	0	1	0	0
	12:15	0	0	40	11	0	0	0	0	0	0	0	0	0	1	30	0	0	0	0	14	0	5	0	0
	12:30	0	0	49	8	0	0	0	0	0	0	0	0	0	3	36	0	0	0	0	7	0	2	1	0
	12:45	0	0	46	6	0	0	0	0	0	0	0	0	0	4	25	0	0	0	0	16	0	3	0	0
	13:00	0	0	38	13	0	0	0	0	0	0	0	0	0	1	22	0	0	0	0	9	0	3	0	0
	13:15	0	0	51	7	0	0	0	0	0	0	0	0	0	4	24	0	0	0	0	9	0	3	0	0
	13:30	0	0	47	12	0	0	0	0	0	0	0	0	0	5	37	0	0	0	0	8	0	1	0	0
	13:45	0	0	29	5	0	0	0	0	0	0	0	0	0	4	38	0	0	0	0	6	0	3	0	0
	14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15:30	0	0	70	24	0	0	0	0	0	0	0	0	0	25	82	0	0	0	0	13	0	13	0	0
	15:45	0	0	57	20	0	0	0	0	0	0	0	0	0	36	166	0	0	0	0	41	0	54	0	0
	16:00	0	0	74	21	0	0	0	0	0	0	0	0	0	20	96	0	0	0	0	22	0	13	0	0
	16:15	0	0	86	34	0	0	0	0	0	0	0	0	0	21	109	0	0	0	0	33	0	17	0	0
	16:30	0	0	73	10	0	0	0	0	0	0	0	0	0	22	102	0	0	0	0	22	0	8	0	0
	16:45	0	0	75	14	0	0	0	0	0	0	0	0	0	14	92	0	0	0	0	18	0	6	0	0
	17:00	0	0	53	11	0	0	0	0	0	0	0	0	0	11	111	0	0	0	0	18	0	8	0	0
	17:15	0	0	75	10	0	0	0	0	0	0	0	0	0	11	115	0	0	0	0	15	0	8	0	0
	17:30	0	0	60	16	0	0	0	0	0	0	0	0	0	11	103	0	0	0	0	12	0	7	0	0
	17:45	0	0	56	10	0	0	0	0	0	0	0	0	0	12	96	0	1	0	0	15	0	12	0	0
	18:00	0	0	68	5	0	0	0	0	0	0	0	0	0	11	86	0	1	0	0	15	0	6	0	0
	18:15	0	0	63	13	0	0	0	0	0	0	0	0	0	3	64	0	1	0	0	11	0	7	0	0
	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Woodmont Avenue and Universe Boulevard

Bicycle Turning Movements

Date	Time	Southbound			Westbound			Northbound			Eastbound		
		Left Turns	Straight Through	Right Turns	Left Turns	Straight Through	Right Turns	Left Turns	Straight Through	Right Turns	Left Turns	Straight Through	Right Turns
05/2/2024	0:00	0	0	0	0	0	0	0	0	0	0	0	0
	0:15	0	0	0	0	0	0	0	0	0	0	0	0
	0:30	0	0	0	0	0	0	0	0	0	0	0	0
	0:45	0	0	0	0	0	0	0	0	0	0	0	0
	1:00	0	0	0	0	0	0	0	0	0	0	0	0
	1:15	0	0	0	0	0	0	0	0	0	0	0	0
	1:30	0	0	0	0	0	0	0	0	0	0	0	0
	1:45	0	0	0	0	0	0	0	0	0	0	0	0
	2:00	0	0	0	0	0	0	0	0	0	0	0	0
	2:15	0	0	0	0	0	0	0	0	0	0	0	0
	2:30	0	0	0	0	0	0	0	0	0	0	0	0
	2:45	0	0	0	0	0	0	0	0	0	0	0	0
	3:00	0	0	0	0	0	0	0	0	0	0	0	0
	3:15	0	0	0	0	0	0	0	0	0	0	0	0
	3:30	0	0	0	0	0	0	0	0	0	0	0	0
	3:45	0	0	0	0	0	0	0	0	0	0	0	0
	4:00	0	0	0	0	0	0	0	0	0	0	0	0
	4:15	0	0	0	0	0	0	0	0	0	0	0	0
	4:30	0	0	0	0	0	0	0	0	0	0	0	0
	4:45	0	0	0	0	0	0	0	0	0	0	0	0
	5:00	0	0	0	0	0	0	0	0	0	0	0	0
	5:15	0	0	0	0	0	0	0	0	0	0	0	0
	5:30	0	0	0	0	0	0	0	0	0	0	0	0
	5:45	0	0	0	0	0	0	0	0	0	0	0	0
	6:00	0	0	0	0	0	0	0	0	0	0	0	0
	6:15	0	0	0	0	0	0	0	0	0	0	0	0
	6:30	0	0	0	0	0	0	0	0	0	0	0	0
	6:45	0	0	0	0	0	0	0	0	0	0	0	0
	7:00	0	0	0	0	0	0	0	0	0	0	0	0
	7:15	0	0	0	0	0	0	0	0	0	0	0	0
	7:30	0	0	0	0	0	0	0	0	0	0	0	0
	7:45	0	0	0	0	0	0	0	0	0	0	0	0
	8:00	0	0	0	0	0	0	0	0	0	0	0	0
	8:15	0	0	0	0	0	0	0	0	0	0	0	0
	8:30	0	0	0	0	0	0	0	0	0	0	0	0
	8:45	0	0	0	0	0	0	0	0	0	0	0	0
	9:00	0	0	0	0	0	0	0	0	0	0	0	0
	9:15	0	0	0	0	0	0	0	0	0	0	0	0
	9:30	0	0	0	0	0	0	0	0	0	0	0	0
	9:45	0	0	0	0	0	0	0	0	0	0	0	0
	10:00	0	0	0	0	0	0	0	0	0	0	0	0
	10:15	0	0	0	0	0	0	0	0	0	0	0	0
	10:30	0	0	0	0	0	0	0	0	0	0	0	0
	10:45	0	0	0	0	0	0	0	0	0	0	0	0
	11:00	0	0	0	0	0	0	0	0	0	0	0	0
	11:15	0	0	0	0	0	0	0	0	0	0	0	0
	11:30	0	0	0	0	0	0	0	0	0	0	0	0
	11:45	0	0	0	0	0	0	0	0	0	0	0	0
	12:00	0	0	0	0	0	0	0	0	0	0	0	0
	12:15	0	0	0	0	0	0	0	0	0	0	0	0
	12:30	0	0	0	0	0	0	0	0	0	0	0	0
	12:45	0	0	0	0	0	0	0	0	0	0	0	0
	13:00	0	0	0	0	0	0	0	0	0	0	0	0
	13:15	0	0	0	0	0	0	0	0	0	0	0	0
	13:30	0	0	0	0	0	0	0	0	0	0	0	0
	13:45	0	0	0	0	0	0	0	0	0	0	0	0
	14:00	0	0	0	0	0	0	0	0	0	0	0	0
	14:15	0	0	0	0	0	0	0	0	0	0	0	0
	14:30	0	0	0	0	0	0	0	0	0	0	0	0
	14:45	0	0	0	0	0	0	0	0	0	0	0	0
	15:00	0	0	0	0	0	0	0	0	0	0	0	0
	15:15	0	0	0	0	0	0	0	0	0	0	0	0
	15:30	0	0	0	0	0	0	0	0	0	0	0	0
	15:45	0	0	0	0	0	0	0	0	0	0	0	0
	16:00	0	0	0	0	0	0	0	0	0	0	0	0
	16:15	0	0	0	0	0	0	0	0	0	0	0	0
	16:30	0	0	0	0	0	0	0	0	0	0	0	0
	16:45	0	0	0	0	0	0	0	0	0	0	0	0
	17:00	0	1	0	0	0	0	0	0	0	0	0	0
	17:15	0	0	0	0	0	0	0	0	0	0	0	0
	17:30	0	0	0	0	0	0	0	0	0	0	0	0
	17:45	0	0	0	0	0	0	0	0	0	0	0	0
	18:00	0	0	0	0	0	0	0	0	0	0	0	0
	18:15	0	0	0	0	0	0	0	0	0	0	0	0
	18:30	0	0	0	0	0	0	0	0	0	0	0	0
	18:45	0	0	0	0	0	0	0	0	0	0	0	0
	19:00	0	0	0	0	0	0	0	0	0	0	0	0
	19:15	0	0	0	0	0	0	0	0	0	0	0	0
	19:30	0	0	0	0	0	0	0	0	0	0	0	0
	19:45	0	0	0	0	0	0	0	0	0	0	0	0
	20:00	0	0	0	0	0	0	0	0	0	0	0	0
	20:15	0	0	0	0	0	0	0	0	0	0	0	0
	20:30	0	0	0	0	0	0	0	0	0	0	0	0
	20:45	0	0	0	0	0	0	0	0	0	0	0	0
	21:00	0	0	0	0	0	0	0	0	0	0	0	0
	21:15	0	0	0	0	0	0	0	0	0	0	0	0
	21:30	0	0	0	0	0	0	0	0	0	0	0	0
	21:45	0	0	0	0	0	0	0	0	0	0	0	0
	22:00	0	0	0	0	0	0	0	0	0	0	0	0
	22:15	0	0	0	0	0	0	0	0	0	0	0	0
	22:30	0	0	0	0	0	0	0	0	0	0	0	0
	22:45	0	0	0	0	0	0	0	0	0	0	0	0
	23:00	0	0	0	0	0	0	0	0	0	0	0	0
	23:15	0	0	0	0	0	0	0	0	0	0	0	0
	23:30	0	0	0	0	0	0	0	0	0	0	0	0
	23:45	0	0	0	0	0	0	0	0	0	0	0	0

Study Start:	5/1/2024 13:45	America/Denver
Study End:	5/3/2024 11:20	America/Denver
Duration:	45	hours
Total Vehicles:	28602	
Study Location:	https://www.google.com/maps/search/?api=1&query=35.178672667,-106.721603&z=15	
Distance to Centerline(ft):	23	
SB Average Speed:	42	
NB Average Speed:	40	
SB 85th %ile Speed:	47	
NB 85th %ile Speed:	43	
Overall Average Speed:	41	
Overall 85th %ile Speed:	45	

DATE	TIME America/Denver	SB Volume	NB Volume
5/1/2024	14:00	113	106
5/1/2024	14:15	132	108
5/1/2024	14:30	138	134
5/1/2024	14:45	125	110
5/1/2024	15:00	118	126
5/1/2024	15:15	133	134
5/1/2024	15:30	136	159
5/1/2024	15:45	135	182
5/1/2024	16:00	128	179
5/1/2024	16:15	130	170
5/1/2024	16:30	114	163
5/1/2024	16:45	115	160
5/1/2024	17:00	135	148
5/1/2024	17:15	132	197
5/1/2024	17:30	117	169
5/1/2024	17:45	132	149
5/1/2024	18:00	98	155
5/1/2024	18:15	101	130
5/1/2024	18:30	122	117
5/1/2024	18:45	94	121
5/1/2024	19:00	99	111
5/1/2024	19:15	86	86
5/1/2024	19:30	110	79
5/1/2024	19:45	105	60
5/1/2024	20:00	68	87
5/1/2024	20:15	56	79
5/1/2024	20:30	78	83
5/1/2024	20:45	71	68
5/1/2024	21:00	53	68
5/1/2024	21:15	84	52

DATE	TIME America/Denver	SB Volume	NB Volume
5/1/2024	21:30	46	69
5/1/2024	21:45	56	44
5/1/2024	22:00	56	39
5/1/2024	22:15	37	37
5/1/2024	22:30	33	27
5/1/2024	22:45	26	26
5/1/2024	23:00	27	21
5/1/2024	23:15	31	19
5/1/2024	23:30	16	16
5/1/2024	23:45	18	18
5/2/2024	0:00	7	24
5/2/2024	0:15	13	11
5/2/2024	0:30	12	11
5/2/2024	0:45	14	7
5/2/2024	1:00	5	8
5/2/2024	1:15	4	20
5/2/2024	1:30	10	4
5/2/2024	1:45	6	7
5/2/2024	2:00	9	4
5/2/2024	2:15	4	9
5/2/2024	2:30	7	6
5/2/2024	2:45	5	8
5/2/2024	3:00	7	5
5/2/2024	3:15	7	4
5/2/2024	3:30	4	6
5/2/2024	3:45	9	6
5/2/2024	4:00	12	9
5/2/2024	4:15	18	15
5/2/2024	4:30	17	16
5/2/2024	4:45	14	17
5/2/2024	5:00	19	27
5/2/2024	5:15	29	24
5/2/2024	5:30	52	38
5/2/2024	5:45	33	29
5/2/2024	6:00	70	74
5/2/2024	6:15	78	83
5/2/2024	6:30	101	113
5/2/2024	6:45	119	121
5/2/2024	7:00	131	135
5/2/2024	7:15	162	154
5/2/2024	7:30	178	130
5/2/2024	7:45	125	131
5/2/2024	8:00	128	143

DATE	TIME America/Denver	SB Volume	NB Volume
5/2/2024	8:15	121	134
5/2/2024	8:30	117	133
5/2/2024	8:45	91	105
5/2/2024	9:00	119	133
5/2/2024	9:15	108	117
5/2/2024	9:30	106	103
5/2/2024	9:45	81	100
5/2/2024	10:00	87	96
5/2/2024	10:15	80	90
5/2/2024	10:30	96	73
5/2/2024	10:45	106	84
5/2/2024	11:00	75	85
5/2/2024	11:15	85	81
5/2/2024	11:30	95	93
5/2/2024	11:45	96	94
5/2/2024	12:00	73	95
5/2/2024	12:15	91	106
5/2/2024	12:30	93	100
5/2/2024	12:45	85	91
5/2/2024	13:00	78	99
5/2/2024	13:15	106	88
5/2/2024	13:30	97	108
5/2/2024	13:45	92	116
5/2/2024	14:00	111	109
5/2/2024	14:15	121	119
5/2/2024	14:30	131	114
5/2/2024	14:45	132	117
5/2/2024	15:00	120	108
5/2/2024	15:15	110	130
5/2/2024	15:30	143	154
5/2/2024	15:45	137	154
5/2/2024	16:00	140	172
5/2/2024	16:15	140	161
5/2/2024	16:30	161	188
5/2/2024	16:45	164	197
5/2/2024	17:00	169	165
5/2/2024	17:15	152	209
5/2/2024	17:30	153	196
5/2/2024	17:45	156	142
5/2/2024	18:00	128	154
5/2/2024	18:15	110	137
5/2/2024	18:30	118	139
5/2/2024	18:45	100	126

DATE	TIME America/Denver	SB Volume	NB Volume
5/2/2024	19:00	94	78
5/2/2024	19:15	95	95
5/2/2024	19:30	89	77
5/2/2024	19:45	95	110
5/2/2024	20:00	106	118
5/2/2024	20:15	57	94
5/2/2024	20:30	78	90
5/2/2024	20:45	78	80
5/2/2024	21:00	60	65
5/2/2024	21:15	54	111
5/2/2024	21:30	48	75
5/2/2024	21:45	51	67
5/2/2024	22:00	55	34
5/2/2024	22:15	44	41
5/2/2024	22:30	37	23
5/2/2024	22:45	30	25
5/2/2024	23:00	28	27
5/2/2024	23:15	27	19
5/2/2024	23:30	7	27
5/2/2024	23:45	12	19
5/3/2024	0:00	9	20
5/3/2024	0:15	9	15
5/3/2024	0:30	8	7
5/3/2024	0:45	6	10
5/3/2024	1:00	4	7
5/3/2024	1:15	7	7
5/3/2024	1:30	1	10
5/3/2024	1:45	5	4
5/3/2024	2:00	5	7
5/3/2024	2:15	7	8
5/3/2024	2:30	8	6
5/3/2024	2:45	7	10
5/3/2024	3:00	10	9
5/3/2024	3:15	9	6
5/3/2024	3:30	7	11
5/3/2024	3:45	3	8
5/3/2024	4:00	8	5
5/3/2024	4:15	7	8
5/3/2024	4:30	16	15
5/3/2024	4:45	18	15
5/3/2024	5:00	19	18
5/3/2024	5:15	28	28
5/3/2024	5:30	56	30

DATE	TIME America/Denver	SB Volume	NB Volume
5/3/2024	5:45	29	29
5/3/2024	6:00	64	71
5/3/2024	6:15	97	94
5/3/2024	6:30	99	127
5/3/2024	6:45	113	114
5/3/2024	7:00	138	142
5/3/2024	7:15	157	156
5/3/2024	7:30	159	146
5/3/2024	7:45	138	157
5/3/2024	8:00	104	172
5/3/2024	8:15	104	198
5/3/2024	8:30	102	170
5/3/2024	8:45	89	143
5/3/2024	9:00	104	105
5/3/2024	9:15	118	145
5/3/2024	9:30	107	137
5/3/2024	9:45	98	108
5/3/2024	10:00	100	105
5/3/2024	10:15	89	98
5/3/2024	10:30	103	107
5/3/2024	10:45	90	116
5/3/2024	11:00	110	102

APPENDIX C ITE TRIP GENERATION

Single-Family Detached Housing
(210)

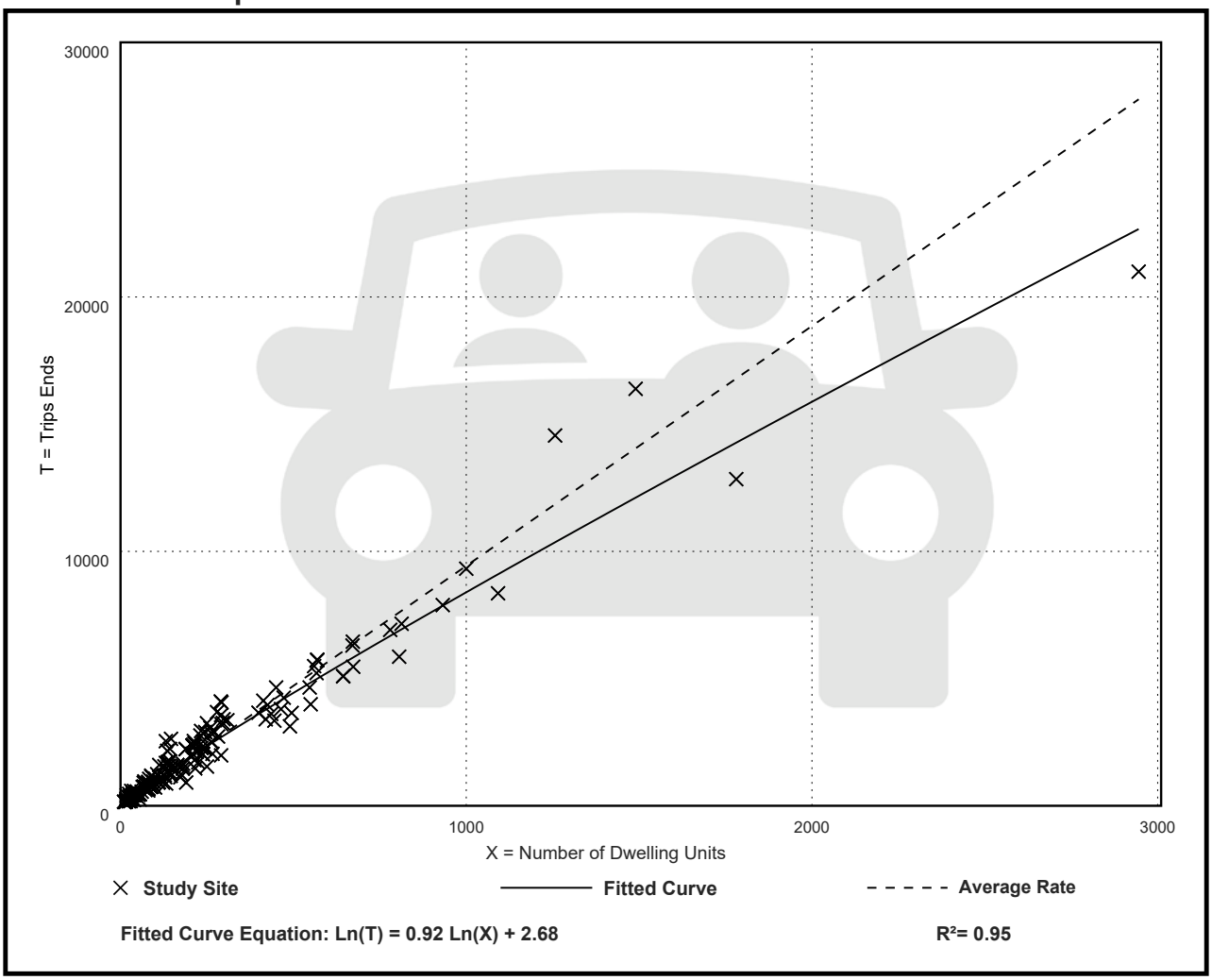
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 174
Avg. Num. of Dwelling Units: 246
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.92 Ln(X) + 2.68

R^2= 0.95

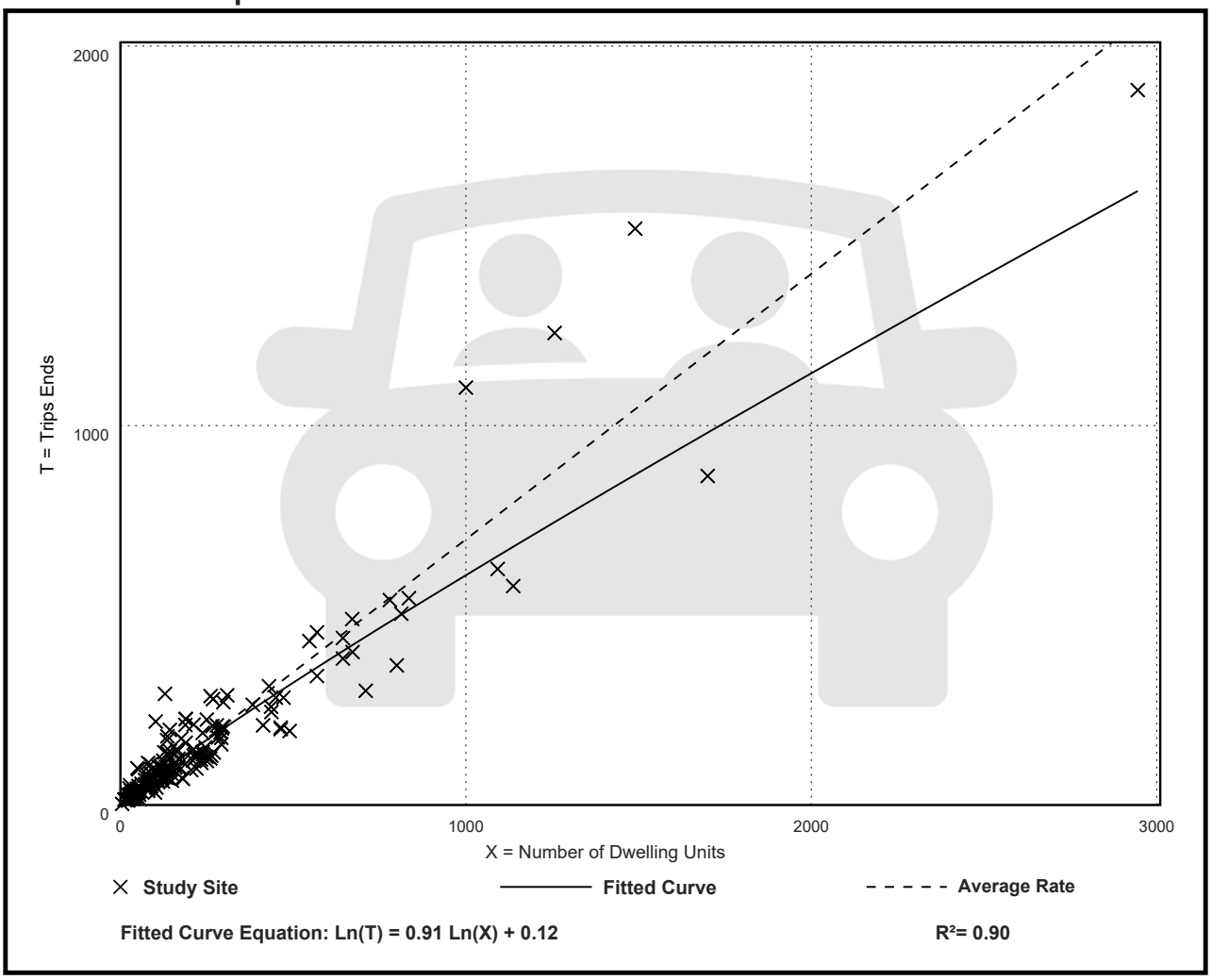
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 192
Avg. Num. of Dwelling Units: 226
Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



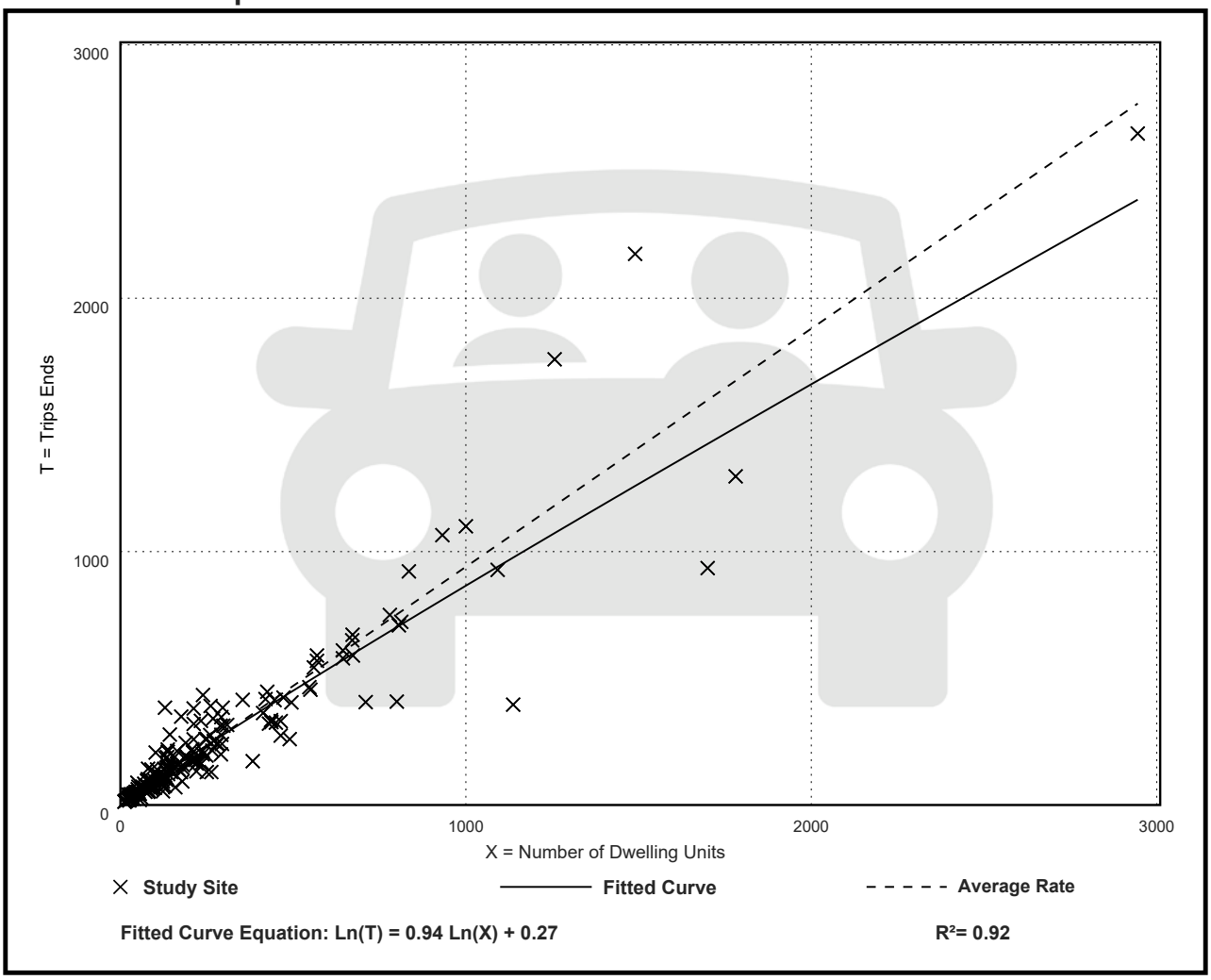
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 208
Avg. Num. of Dwelling Units: 248
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



APPENDIX D **CAB**Q DPM AND AASHTO GREEN BOOK INTERSECTION SIGHT DISTANCE CALCULATIONS

FIGURE 7.4.93 **Intersection Sight Distance**

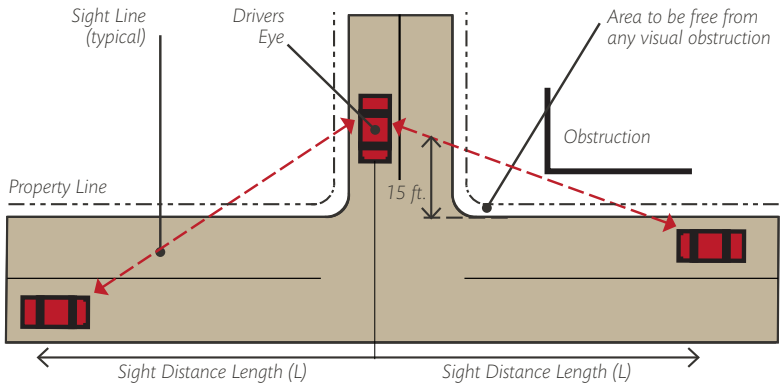


TABLE 7.4.65 **Minimum Intersection Sight Distance**

Speed Limit (MPH)	Minimum Intersection Sight Distance					
	2 Lane Undivided		3 Lane Undivided or 2 Lane Divided w/ 12 ft. Median		4 Lane Undivided	
	Left Turn	Right Turn	Left Turn	Right Turn	Left Turn	Right Turn
20	230 ft.	200 ft.	240 ft.	200 ft.	250 ft.	200 ft.
25	280 ft.	240 ft.	300 ft.	240 ft.	320 ft.	240 ft.
30	340 ft.	290 ft.	360 ft.	290 ft.	380 ft.	290 ft.
35	390 ft.	340 ft.	420 ft.	340 ft.	440 ft.	340 ft.
40	450 ft.	390 ft.	480 ft.	390 ft.	500 ft.	390 ft.
45	500 ft.	430 ft.	530 ft.	430 ft.	570 ft.	430 ft.
50	560 ft.	480 ft.	590 ft.	480 ft.	630 ft.	480 ft.

Unser Boulevard & Extension of Woodmont Avenue

Scenario:	Left Turn from the Minor Road
Type of Vehicle:	Passenger Car
# Lanes Crossing:	2
Speed Limit (mph):	35
Median?	Yes
Enter Median Width:	14
Base Time Gap:	7.5
Additional Lanes to Cross:	3
Additional Time:	1.5
Final Time Gap:	9
SIGHT DISTANCE REQUIRED	463.05
SIGHT DISTANCE REQUIRED (Rounded)	**465**

$$ISD = 1.47\ (V_{major})\ t_g$$

t_g Values				
	CASE	Passenger Car	Single-Unit Truck	Combination Truck
B1	Left Turn from the Minor Road	7.5	9.5	11.5
B2	Right Turn from the Minor Road	6.5	8.5	10.5
B3	Crossing Maneuver from the Minor Road			
F	Left Turn from the Major Road	5.5	6.5	7.5

CASE B1 - For a stopped vehicle to turn left onto a 2-lane highway with no median and grades 3 percent or less

For left turns onto two-way highways with more than 2 lanes:
+0.5 seconds for passenger cars
+0.7 seconds for trucks
for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.

For minor road approach grades:
+0.2 seconds for each percent grade
if the approach grade is an upgrade that exceeds 3 percent.

CASE B2 + B3 - For a stopped vehicle to turn right onto or cross a 2-lane highway with no median and grades 3 percent or less

For crossing a major road with more than 2 lanes:
+0.5 seconds for passenger cars
+0.7 seconds for trucks
for each additional lane to be crossed and narrow medians that cannot store the design vehicle.

For minor road approach grades:
+0.1 seconds for each percent grade
if the approach grade is an upgrade that exceeds 3 percent.

CASE F – For a stopped vehicle to turn across one lane of opposing traffic

For left-turning vehicles that cross more than 1 opposing lane:
+0.5 seconds for passenger cars
+0.7 seconds for trucks
for each additional lane to be crossed.

Unser Boulevard & Extension of Woodmont Avenue

Scenario:	Right Turn from the Minor Road
Type of Vehicle:	Passenger Car
# Lanes Crossing:	2
Speed Limit (mph):	35
Median?	Yes
Enter Median Width:	14
Base Time Gap:	6.5
Additional Lanes to Cross:	0
Additional Time:	0
Final Time Gap:	6.5
SIGHT DISTANCE REQUIRED	334.43
SIGHT DISTANCE REQUIRED (Rounded)	**335**

$$ISD = 1.47\ (V_{major})\ t_g$$

t_g Values				
	CASE	Passenger Car	Single-Unit Truck	Combination Truck
B1	Left Turn from the Minor Road	7.5	9.5	11.5
B2	Right Turn from the Minor Road	6.5	8.5	10.5
B3	Crossing Maneuver from the Minor Road			
F	Left Turn from the Major Road	5.5	6.5	7.5

CASE B1 - For a stopped vehicle to turn left onto a 2-lane highway with no median and grades 3 percent or less

For left turns onto two-way highways with more than 2 lanes:
+0.5 seconds for passenger cars
+0.7 seconds for trucks
for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.

For minor road approach grades:
+0.2 seconds for each percent grade
if the approach grade is an upgrade that exceeds 3 percent.

CASE B2 + B3 - For a stopped vehicle to turn right onto or cross a 2-lane highway with no median and grades 3 percent or less

For crossing a major road with more than 2 lanes:
+0.5 seconds for passenger cars
+0.7 seconds for trucks
for each additional lane to be crossed and narrow medians that cannot store the design vehicle.

For minor road approach grades:
+0.1 seconds for each percent grade
if the approach grade is an upgrade that exceeds 3 percent.

CASE F – For a stopped vehicle to turn across one lane of opposing traffic

For left-turning vehicles that cross more than 1 opposing lane:
+0.5 seconds for passenger cars
+0.7 seconds for trucks
for each additional lane to be crossed.

APPENDIX E HCM ANALYSIS OUTPUT SHEETS

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	67	0	131	0	0	0	37	231	0	0	552	48
Future Vol, veh/h	67	0	131	0	0	0	37	231	0	0	552	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	300	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	73	0	142	0	0	0	40	251	0	0	600	52

Major/Minor	Minor2					Major1			Major2		
Conflicting Flow All	957	-	626			652	0	-	-	-	0
Stage 1	626	-	-			-	-	-	-	-	-
Stage 2	331	-	-			-	-	-	-	-	-
Critical Hdwy	6.42	-	6.22			4.12	-	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-			-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-			-	-	-	-	-	-
Follow-up Hdwy	3.518	-	3.318			2.218	-	-	-	-	-
Pot Cap-1 Maneuver	286	0	484			935	-	0	0	-	-
Stage 1	533	0	-			-	-	0	0	-	-
Stage 2	728	0	-			-	-	0	0	-	-
Platoon blocked, %							-			-	-
Mov Cap-1 Maneuver	274	0	484			935	-	-	-	-	-
Mov Cap-2 Maneuver	274	0	-			-	-	-	-	-	-
Stage 1	510	0	-			-	-	-	-	-	-
Stage 2	728	0	-			-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	18	1.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	935	-	274	484	-	-
HCM Lane V/C Ratio	0.043	-	0.266	0.294	-	-
HCM Control Delay (s/veh)	9	-	22.8	15.5	-	-
HCM Lane LOS	A	-	C	C	-	-
HCM 95th %tile Q (veh)	0.1	-	1	1.2	-	-

Intersection	
Int Delay, s/veh	14.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	118	0	92	0	0	0	99	473	0	0	290	85
Future Vol, veh/h	118	0	92	0	0	0	99	473	0	0	290	85
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	300	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	153	0	119	0	0	0	129	614	0	0	377	110

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1304	-	432	487	0	-	-	-	0
Stage 1	432	-	-	-	-	-	-	-	-
Stage 2	872	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	-	6.22	4.12	-	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	-	3.318	2.218	-	-	-	-	-
Pot Cap-1 Maneuver	177	0	624	1076	-	0	0	-	-
Stage 1	655	0	-	-	-	0	0	-	-
Stage 2	409	0	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	156	0	624	1076	-	-	-	-	-
Mov Cap-2 Maneuver	156	0	-	-	-	-	-	-	-
Stage 1	576	0	-	-	-	-	-	-	-
Stage 2	409	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	75.7	1.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1076	-	156	624	-	-
HCM Lane V/C Ratio	0.119	-	0.982	0.191	-	-
HCM Control Delay (s/veh)	8.8	-	125.2	12.1	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q (veh)	0.4	-	7.4	0.7	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	68	0	133	0	0	0	38	304	0	0	607	49
Future Vol, veh/h	68	0	133	0	0	0	38	304	0	0	607	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	300	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	74	0	145	0	0	0	41	330	0	0	660	53

Major/Minor	Minor2					Major1			Major2		
Conflicting Flow All	1099	-	687			713	0	-	-	-	0
Stage 1	687	-	-			-	-	-	-	-	-
Stage 2	412	-	-			-	-	-	-	-	-
Critical Hdwy	6.42	-	6.22			4.12	-	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-			-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-			-	-	-	-	-	-
Follow-up Hdwy	3.518	-	3.318			2.218	-	-	-	-	-
Pot Cap-1 Maneuver	235	0	447			887	-	0	0	-	-
Stage 1	499	0	-			-	-	0	0	-	-
Stage 2	669	0	-			-	-	0	0	-	-
Platoon blocked, %							-			-	-
Mov Cap-1 Maneuver	224	0	447			887	-	-	-	-	-
Mov Cap-2 Maneuver	224	0	-			-	-	-	-	-	-
Stage 1	476	0	-			-	-	-	-	-	-
Stage 2	669	0	-			-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	20.9	1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	887	-	224	447	-	-
HCM Lane V/C Ratio	0.047	-	0.33	0.323	-	-
HCM Control Delay (s/veh)	9.3	-	28.8	16.9	-	-
HCM Lane LOS	A	-	D	C	-	-
HCM 95th %tile Q (veh)	0.1	-	1.4	1.4	-	-

Intersection	
Int Delay, s/veh	25.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	120	0	93	0	0	0	100	541	0	0	358	86
Future Vol, veh/h	120	0	93	0	0	0	100	541	0	0	358	86
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	300	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	156	0	121	0	0	0	130	703	0	0	465	112

Major/Minor	Minor2					Major1			Major2		
Conflicting Flow All	1484	-	521			577	0	-	-	-	0
Stage 1	521	-	-			-	-	-	-	-	-
Stage 2	963	-	-			-	-	-	-	-	-
Critical Hdwy	6.42	-	6.22			4.12	-	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-			-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-			-	-	-	-	-	-
Follow-up Hdwy	3.518	-	3.318			2.218	-	-	-	-	-
Pot Cap-1 Maneuver	~ 137	0	555			996	-	0	0	-	-
Stage 1	596	0	-			-	-	0	0	-	-
Stage 2	370	0	-			-	-	0	0	-	-
Platoon blocked, %							-			-	-
Mov Cap-1 Maneuver	~ 119	0	555			996	-	-	-	-	-
Mov Cap-2 Maneuver	~ 119	0	-			-	-	-	-	-	-
Stage 1	518	0	-			-	-	-	-	-	-
Stage 2	370	0	-			-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	149.8	1.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	996	-	119	555	-	-
HCM Lane V/C Ratio	0.13	-	1.31	0.218	-	-
HCM Control Delay (s/veh)	9.2	-	255.5	13.3	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q (veh)	0.4	-	10.3	0.8	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	68	2	133	12	6	18	38	310	4	7	609	49
Future Vol, veh/h	68	2	133	12	6	18	38	310	4	7	609	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	180	-	0	-	-	-	300	-	-	265	-	390
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	74	2	145	13	7	20	41	337	4	8	662	53

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1113	1101	662	1199	1152	339	715	0	0	341	0	0
Stage 1	678	678	-	421	421	-	-	-	-	-	-	-
Stage 2	435	423	-	778	731	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	186	212	462	162	198	703	885	-	-	1218	-	-
Stage 1	442	452	-	610	589	-	-	-	-	-	-	-
Stage 2	600	588	-	389	427	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	169	201	462	106	188	703	885	-	-	1218	-	-
Mov Cap-2 Maneuver	169	201	-	106	188	-	-	-	-	-	-	-
Stage 1	422	449	-	582	562	-	-	-	-	-	-	-
Stage 2	550	561	-	264	424	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	24.9	25.9	1	0.1
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	885	-	-	169	201	462	211	1218	-	-
HCM Lane V/C Ratio	0.047	-	-	0.437	0.011	0.313	0.185	0.006	-	-
HCM Control Delay (s/veh)	9.3	-	-	41.9	23.1	16.3	25.9	8	-	-
HCM Lane LOS	A	-	-	E	C	C	D	A	-	-
HCM 95th %tile Q (veh)	0.1	-	-	2	0	1.3	0.7	0	-	-

Intersection	
Int Delay, s/veh	7.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	13	25	0	36	72
Future Vol, veh/h	0	13	25	0	36	72
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	265	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	14	27	0	39	78

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	14	0	61	7
Stage 1	-	-	-	-	7	-
Stage 2	-	-	-	-	54	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1604	-	945	1075
Stage 1	-	-	-	-	1016	-
Stage 2	-	-	-	-	969	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1604	-	929	1075
Mov Cap-2 Maneuver	-	-	-	-	929	-
Stage 1	-	-	-	-	1016	-
Stage 2	-	-	-	-	953	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	7.3	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	929	1075	-	-	1604	-
HCM Lane V/C Ratio	0.042	0.073	-	-	0.017	-
HCM Control Delay (s/veh)	9	8.6	-	-	7.3	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q (veh)	0.1	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	42	30	10	627	607	15
Future Vol, veh/h	42	30	10	627	607	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	265	0	265	-	-	390
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	32	11	660	639	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1321	639	655	0	-	0
Stage 1	639	-	-	-	-	-
Stage 2	682	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	173	476	932	-	-	-
Stage 1	526	-	-	-	-	-
Stage 2	502	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	171	476	932	-	-	-
Mov Cap-2 Maneuver	171	-	-	-	-	-
Stage 1	520	-	-	-	-	-
Stage 2	502	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	24.8	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	932	-	171	476	-	-
HCM Lane V/C Ratio	0.011	-	0.259	0.066	-	-
HCM Control Delay (s/veh)	8.9	-	33.2	13.1	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q (veh)	0	-	1	0.2	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	6	346	2	2	752
Future Vol, veh/h	6	6	346	2	2	752
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	7	376	2	2	817

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1198	377	0	0	378	0
Stage 1	377	-	-	-	-	-
Stage 2	821	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	205	670	-	-	1180	-
Stage 1	694	-	-	-	-	-
Stage 2	432	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	204	670	-	-	1180	-
Mov Cap-2 Maneuver	204	-	-	-	-	-
Stage 1	694	-	-	-	-	-
Stage 2	431	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	17	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	313	1180	-
HCM Lane V/C Ratio	-	-	0.042	0.002	-
HCM Control Delay (s/veh)	-	-	17	8.1	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q (veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	52.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	120	7	93	8	4	13	100	545	14	21	365	86
Future Vol, veh/h	120	7	93	8	4	13	100	545	14	21	365	86
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	180	-	0	-	-	-	300	-	-	265	-	390
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	156	9	121	10	5	17	130	708	18	27	474	112

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1516	1514	474	1626	1617	717	586	0	0	726	0	0
Stage 1	528	528	-	977	977	-	-	-	-	-	-	-
Stage 2	988	986	-	649	640	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 98	120	590	82	103	430	989	-	-	877	-	-
Stage 1	534	528	-	302	329	-	-	-	-	-	-	-
Stage 2	297	326	-	458	470	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 79	101	590	53	87	430	989	-	-	877	-	-
Mov Cap-2 Maneuver	~ 79	101	-	53	87	-	-	-	-	-	-	-
Stage 1	464	512	-	262	286	-	-	-	-	-	-	-
Stage 2	243	283	-	347	455	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 315.9	50.9	1.4	0.4
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	989	-	-	79	101	590	110	877	-	-
HCM Lane V/C Ratio	0.131	-	-	1.973	0.09	0.205	0.295	0.031	-	-
HCM Control Delay (s/veh)	9.2	-	-	$ 566.7	44.1	12.7	50.9	9.2	-	-
HCM Lane LOS	A	-	-	F	E	B	F	A	-	-
HCM 95th %tile Q (veh)	0.5	-	-	13.8	0.3	0.8	1.1	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	6.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	42	84	0	25	49
Future Vol, veh/h	0	42	84	0	25	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	265	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	46	91	0	27	53

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	46	0	205	23
Stage 1	-	-	-	-	23	-
Stage 2	-	-	-	-	182	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1562	-	783	1054
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	849	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1562	-	738	1054
Mov Cap-2 Maneuver	-	-	-	-	738	-
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	800	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	7.4	9.1
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	738	1054	-	-	1562	-
HCM Lane V/C Ratio	0.037	0.051	-	-	0.058	-
HCM Control Delay (s/veh)	10.1	8.6	-	-	7.4	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q (veh)	0.1	0.2	-	-	0.2	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	29	20	35	782	676	49
Future Vol, veh/h	29	20	35	782	676	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	265	0	265	-	-	390
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	21	36	806	697	51

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1575	697	748	0	-	0
Stage 1	697	-	-	-	-	-
Stage 2	878	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	121	441	861	-	-	-
Stage 1	494	-	-	-	-	-
Stage 2	406	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	116	441	861	-	-	-
Mov Cap-2 Maneuver	116	-	-	-	-	-
Stage 1	473	-	-	-	-	-
Stage 2	406	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	33.1	0.4	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	861	-	116	441	-	-
HCM Lane V/C Ratio	0.042	-	0.258	0.047	-	-
HCM Control Delay (s/veh)	9.4	-	46.5	13.6	-	-
HCM Lane LOS	A	-	E	B	-	-
HCM 95th %tile Q (veh)	0.1	-	1	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	4	656	7	7	460
Future Vol, veh/h	4	4	656	7	7	460
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	4	713	8	8	500

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1233	717	0	0	721	0
Stage 1	717	-	-	-	-	-
Stage 2	516	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	195	430	-	-	881	-
Stage 1	484	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	192	430	-	-	881	-
Mov Cap-2 Maneuver	192	-	-	-	-	-
Stage 1	484	-	-	-	-	-
Stage 2	591	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	19	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	265	881	-
HCM Lane V/C Ratio	-	-	0.033	0.009	-
HCM Control Delay (s/veh)	-	-	19	9.1	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q (veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	79	0	154	0	0	0	44	342	0	0	697	57
Future Vol, veh/h	79	0	154	0	0	0	44	342	0	0	697	57
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	180	-	0	-	-	-	300	-	-	265	-	390
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	86	0	167	0	0	0	48	372	0	0	758	62

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1226	1226	758	1341	1288	372	820	0	0	372	0	0
Stage 1	758	758	-	468	468	-	-	-	-	-	-	-
Stage 2	468	468	-	873	820	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	155	179	407	129	164	674	809	-	-	1186	-	-
Stage 1	399	415	-	575	561	-	-	-	-	-	-	-
Stage 2	575	561	-	345	389	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	148	168	407	72	154	674	809	-	-	1186	-	-
Mov Cap-2 Maneuver	148	168	-	72	154	-	-	-	-	-	-	-
Stage 1	375	415	-	541	528	-	-	-	-	-	-	-
Stage 2	541	528	-	203	389	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	33	0	1.1	0
HCM LOS	D	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	809	-	-	148	-	407	-	1186	-	-
HCM Lane V/C Ratio	0.059	-	-	0.58	-	0.411	-	-	-	-
HCM Control Delay (s/veh)	9.7	-	-	58.5	0	19.9	0	0	-	-
HCM Lane LOS	A	-	-	F	A	C	A	A	-	-
HCM 95th %tile Q (veh)	0.2	-	-	3	-	2	-	0	-	-

Intersection	
Int Delay, s/veh	78.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	139	0	108	0	0	0	117	618	0	0	406	100
Future Vol, veh/h	139	0	108	0	0	0	117	618	0	0	406	100
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	180	-	0	-	-	-	300	-	-	265	-	390
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	181	0	140	0	0	0	152	803	0	0	527	130

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1634	1634	527	1769	1764	803	657	0	0	803	0	0
Stage 1	527	527	-	1107	1107	-	-	-	-	-	-	-
Stage 2	1107	1107	-	662	657	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 81	101	551	65	84	383	931	-	-	821	-	-
Stage 1	535	528	-	255	286	-	-	-	-	-	-	-
Stage 2	255	286	-	451	462	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 71	85	551	42	70	383	931	-	-	821	-	-
Mov Cap-2 Maneuver	~ 71	85	-	42	70	-	-	-	-	-	-	-
Stage 1	448	528	-	213	239	-	-	-	-	-	-	-
Stage 2	213	239	-	336	462	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 470.4	0	1.5	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	931	-	-	71	-	551	-	821	-	-
HCM Lane V/C Ratio	0.163	-	-	2.543	-	0.255	-	-	-	-
HCM Control Delay (s/veh)	9.6	-	-	$ 825.2	0	13.8	0	0	-	-
HCM Lane LOS	A	-	-	F	A	B	A	A	-	-
HCM 95th %tile Q (veh)	0.6	-	-	17.5	-	1	-	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	7.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	79	2	154	12	6	18	44	348	4	7	699	57
Future Vol, veh/h	79	2	154	12	6	18	44	348	4	7	699	57
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	180	-	0	-	-	-	300	-	-	265	-	390
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	86	2	167	13	7	20	48	378	4	8	760	62

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1266	1254	760	1368	1314	380	822	0	0	382	0	0
Stage 1	776	776	-	476	476	-	-	-	-	-	-	-
Stage 2	490	478	-	892	838	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	146	172	406	124	158	667	807	-	-	1176	-	-
Stage 1	390	407	-	570	557	-	-	-	-	-	-	-
Stage 2	560	556	-	337	382	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	130	161	406	68	148	667	807	-	-	1176	-	-
Mov Cap-2 Maneuver	130	161	-	68	148	-	-	-	-	-	-	-
Stage 1	367	404	-	536	524	-	-	-	-	-	-	-
Stage 2	505	523	-	196	379	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	38.5	37.8	1.1	0.1
HCM LOS	E	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	807	-	-	130	161	406	148	1176	-	-
HCM Lane V/C Ratio	0.059	-	-	0.661	0.014	0.412	0.264	0.006	-	-
HCM Control Delay (s/veh)	9.7	-	-	74.9	27.7	19.9	37.8	8.1	-	-
HCM Lane LOS	A	-	-	F	D	C	E	A	-	-
HCM 95th %tile Q (veh)	0.2	-	-	3.6	0	2	1	0	-	-

Intersection	
Int Delay, s/veh	7.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	13	25	0	36	72
Future Vol, veh/h	0	13	25	0	36	72
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	265	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	14	27	0	39	78

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	14	0	61	7
Stage 1	-	-	-	-	7	-
Stage 2	-	-	-	-	54	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1604	-	945	1075
Stage 1	-	-	-	-	1016	-
Stage 2	-	-	-	-	969	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1604	-	929	1075
Mov Cap-2 Maneuver	-	-	-	-	929	-
Stage 1	-	-	-	-	1016	-
Stage 2	-	-	-	-	953	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	7.3	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	929	1075	-	-	1604	-
HCM Lane V/C Ratio	0.042	0.073	-	-	0.017	-
HCM Control Delay (s/veh)	9	8.6	-	-	7.3	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q (veh)	0.1	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	42	30	10	725	703	15
Future Vol, veh/h	42	30	10	725	703	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	265	0	265	-	-	390
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	32	11	763	740	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1144	370	756	0	-	0
Stage 1	740	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	193	627	851	-	-	-
Stage 1	433	-	-	-	-	-
Stage 2	643	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	190	627	851	-	-	-
Mov Cap-2 Maneuver	190	-	-	-	-	-
Stage 1	427	-	-	-	-	-
Stage 2	643	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	21.9	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	851	-	190	627	-	-
HCM Lane V/C Ratio	0.012	-	0.233	0.05	-	-
HCM Control Delay (s/veh)	9.3	-	29.6	11	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q (veh)	0	-	0.9	0.2	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	6	390	2	2	864
Future Vol, veh/h	6	6	390	2	2	864
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	7	424	2	2	939

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1368	425	0	0	426	0
Stage 1	425	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	162	629	-	-	1133	-
Stage 1	659	-	-	-	-	-
Stage 2	379	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	161	629	-	-	1133	-
Mov Cap-2 Maneuver	161	-	-	-	-	-
Stage 1	659	-	-	-	-	-
Stage 2	377	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	19.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	256	1133	-
HCM Lane V/C Ratio	-	-	0.051	0.002	-
HCM Control Delay (s/veh)	-	-	19.8	8.2	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q (veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	114

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	139	7	108	8	4	13	117	622	14	21	413	100
Future Vol, veh/h	139	7	108	8	4	13	117	622	14	21	413	100
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	180	-	0	-	-	-	300	-	-	265	-	390
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	181	9	140	10	5	17	152	808	18	27	536	130

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1722	1720	536	1851	1841	817	666	0	0	826	0	0
Stage 1	590	590	-	1121	1121	-	-	-	-	-	-	-
Stage 2	1132	1130	-	730	720	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 70	89	545	57	75	376	923	-	-	805	-	-
Stage 1	494	495	-	250	282	-	-	-	-	-	-	-
Stage 2	247	279	-	414	432	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 53	72	545	33	61	376	923	-	-	805	-	-
Mov Cap-2 Maneuver	~ 53	72	-	33	61	-	-	-	-	-	-	-
Stage 1	412	478	-	209	235	-	-	-	-	-	-	-
Stage 2	193	233	-	291	417	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 688.7	89	1.5	0.4
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	923	-	-	53	72	545	73	805	-	-
HCM Lane V/C Ratio	0.165	-	-	3.406	0.126	0.257	0.445	0.034	-	-
HCM Control Delay (s/veh)	9.7	-	-	$ 1244.5	62.1	13.9	89	9.6	-	-
HCM Lane LOS	A	-	-	F	F	B	F	A	-	-
HCM 95th %tile Q (veh)	0.6	-	-	19.4	0.4	1	1.8	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	6.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	42	84	0	25	49
Future Vol, veh/h	0	42	84	0	25	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	265	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	46	91	0	27	53

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	46	0	205	23
Stage 1	-	-	-	-	23	-
Stage 2	-	-	-	-	182	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1562	-	783	1054
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	849	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1562	-	738	1054
Mov Cap-2 Maneuver	-	-	-	-	738	-
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	800	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	7.4	9.1
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	738	1054	-	-	1562	-
HCM Lane V/C Ratio	0.037	0.051	-	-	0.058	-
HCM Control Delay (s/veh)	10.1	8.6	-	-	7.4	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q (veh)	0.1	0.2	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	29	20	35	906	781	49
Future Vol, veh/h	29	20	35	906	781	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	265	0	265	-	-	390
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	21	36	934	805	51

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1344	403	856	0	-	0
Stage 1	805	-	-	-	-	-
Stage 2	539	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	143	597	780	-	-	-
Stage 1	400	-	-	-	-	-
Stage 2	549	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	136	597	780	-	-	-
Mov Cap-2 Maneuver	136	-	-	-	-	-
Stage 1	382	-	-	-	-	-
Stage 2	549	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	27.5	0.4	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	780	-	136	597	-	-
HCM Lane V/C Ratio	0.046	-	0.22	0.035	-	-
HCM Control Delay (s/veh)	9.8	-	38.8	11.2	-	-
HCM Lane LOS	A	-	E	B	-	-
HCM 95th %tile Q (veh)	0.1	-	0.8	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	4	749	7	7	522
Future Vol, veh/h	4	4	749	7	7	522
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	4	814	8	8	567

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1401	818	0	0	822	0
Stage 1	818	-	-	-	-	-
Stage 2	583	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	154	376	-	-	807	-
Stage 1	434	-	-	-	-	-
Stage 2	558	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	152	376	-	-	807	-
Mov Cap-2 Maneuver	152	-	-	-	-	-
Stage 1	434	-	-	-	-	-
Stage 2	550	-	-	-	-	-

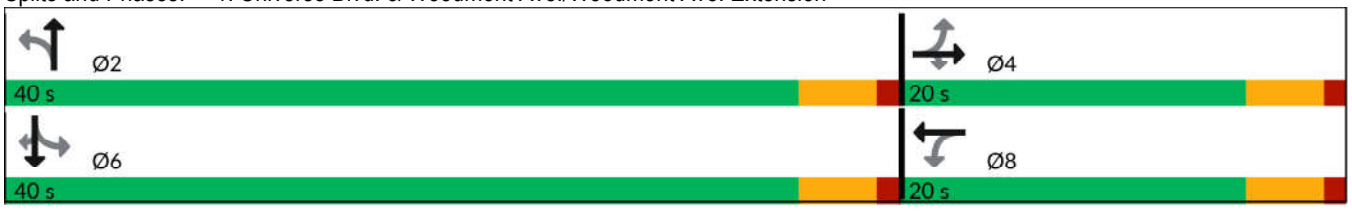
Approach	WB	NB	SB
HCM Control Delay, s/v	22.4	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	216	807	-
HCM Lane V/C Ratio	-	-	0.04	0.009	-
HCM Control Delay (s/veh)	-	-	22.4	9.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q (veh)	-	-	0.1	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	2	154	12	6	18	44	348	4	7	699	57
Future Volume (vph)	79	2	154	12	6	18	44	348	4	7	699	57
Satd. Flow (prot)	1770	1863	1583	0	1708	0	1770	1859	0	1770	1863	1583
Flt Permitted	0.731				0.914		0.265			0.533		
Satd. Flow (perm)	1362	1863	1583	0	1587	0	494	1859	0	993	1863	1583
Satd. Flow (RTOR)			167		20			2				62
Lane Group Flow (vph)	86	2	167	0	40	0	48	382	0	8	760	62
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Total Split (s)	20.0	20.0	20.0	20.0	20.0		40.0	40.0		40.0	40.0	40.0
Total Lost Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Act Effct Green (s)	10.7	10.7	10.7		10.7		28.2	28.2		28.2	28.2	28.2
Actuated g/C Ratio	0.25	0.25	0.25		0.25		0.65	0.65		0.65	0.65	0.65
v/c Ratio	0.26	0.00	0.32		0.10		0.15	0.32		0.01	0.63	0.06
Control Delay (s/veh)	18.4	16.5	5.9		11.9		6.0	5.8		4.1	9.5	1.6
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay (s/veh)	18.4	16.5	5.9		11.9		6.0	5.8		4.1	9.5	1.6
LOS	B	B	A		B		A	A		A	A	A
Approach Delay (s/veh)		10.2			11.9			5.8			8.8	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)	16	0	0		4		5	43		1	116	0
Queue Length 95th (ft)	58	5	39		26		18	89		5	237	10
Internal Link Dist (ft)		669			734			527			1522	
Turn Bay Length (ft)	180						300			265		390
Base Capacity (vph)	502	686	689		597		414	1558		832	1562	1337
Starvation Cap Reductn	0	0	0		0		0	0		0	0	0
Spillback Cap Reductn	0	0	0		0		0	0		0	0	0
Storage Cap Reductn	0	0	0		0		0	0		0	0	0
Reduced v/c Ratio	0.17	0.00	0.24		0.07		0.12	0.25		0.01	0.49	0.05

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 43.4	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay (s/veh): 8.3	Intersection LOS: A
Intersection Capacity Utilization 65.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Universe Blvd. & Woodmont Ave./Woodmont Ave. Extension



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	7	108	8	4	13	117	622	14	21	413	100
Future Volume (vph)	139	7	108	8	4	13	117	622	14	21	413	100
Satd. Flow (prot)	1770	1863	1583	0	1703	0	1770	1857	0	1770	1863	1583
Flt Permitted	0.736				0.937		0.393			0.193		
Satd. Flow (perm)	1371	1863	1583	0	1620	0	732	1857	0	360	1863	1583
Satd. Flow (RTOR)			140		17			3				130
Lane Group Flow (vph)	181	9	140	0	32	0	152	826	0	27	536	130
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Total Split (s)	20.0	20.0	20.0	20.0	20.0		40.0	40.0		40.0	40.0	40.0
Total Lost Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Act Effct Green (s)	12.5	12.5	12.5		12.5		30.1	30.1		30.1	30.1	30.1
Actuated g/C Ratio	0.24	0.24	0.24		0.24		0.58	0.58		0.58	0.58	0.58
v/c Ratio	0.55	0.02	0.29		0.08		0.36	0.76		0.13	0.49	0.13
Control Delay (s/veh)	25.1	16.6	5.8		12.0		9.0	14.3		7.1	8.5	1.6
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay (s/veh)	25.1	16.6	5.8		12.0		9.0	14.3		7.1	8.5	1.6
LOS	C	B	A		B		A	B		A	A	A
Approach Delay (s/veh)		16.7			12.0			13.5			7.2	
Approach LOS		B			B			B			A	
Queue Length 50th (ft)	46	2	0		3		20	154		3	78	0
Queue Length 95th (ft)	90	10	24		18		45	233		12	126	11
Internal Link Dist (ft)		669			734			527			1522	
Turn Bay Length (ft)	180						300			265		390
Base Capacity (vph)	419	570	581		507		529	1344		260	1348	1181
Starvation Cap Reductn	0	0	0		0		0	0		0	0	0
Spillback Cap Reductn	0	0	0		0		0	0		0	0	0
Storage Cap Reductn	0	0	0		0		0	0		0	0	0
Reduced v/c Ratio	0.43	0.02	0.24		0.06		0.29	0.61		0.10	0.40	0.11

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 51.8	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay (s/veh): 11.8	Intersection LOS: B
Intersection Capacity Utilization 71.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Universe Blvd. & Woodmont Ave./Woodmont Ave. Extension