Terry O. Brown P.E.

Central / 98th Commercial Development

(SW Corner of Central Ave. / 98th St.)
(aka Mercado Camino 66)

Traffic Impact Study

August 10, 2009

FINAL

FINAL

Signature Date

TERRY O. BROWN
NEW MEXICO
6407
LICENSED PROFESSIONAL ENGINEER

Presented to:

City of Albuquerque
Transportation Development Section

Prepared for:

Onorio Colucci
Core Properties
P. O. Box 14374
Albuquerque, NM 87191-1434

Terry O. Brown P.E.
P.O. Box 92051
Albuquerque, NM 87199
505 · 883 · 8807

Central / 98th Commercial Development
(Southwest Corner of Central Ave. / 98th St.)
Traffic Impact Study

TABLE OF CONTENTS

Central / 98th St. Commercial Development
(Southwest Corner of Central Ave. / 98th St.)
Traffic Impact Study

STUDY PURPOSE

The purpose of this study is to identify the impact of this new commercial development on the adjacent transportation system and to determine measures necessary to mitigate adverse impacts to the system. The study is being conducted as a condition of approval of a proposed site plan consisting of a commercial development at the Southwest corner of Central Ave. / 98th St. This project is also known as the Colucci Commercial Development. It is being submitted to the City of Albuquerque Transportation Development Division to satisfy their requirements.

STUDY PROCEDURES

A scoping meeting was held by telephone with the City of Albuquerque Transportation Staff (Tony Loyd) prior to the beginning of the study to discuss scope and methodology to be utilized within the report. Basically, this study will follow similar guidelines to the previous study that was conducted last year for the project at the northwest corner of Central Ave. / 98th St. In summary, this report is to define the newly generated trips from the proposed development, assign them into the existing adjacent street system, and analyze the impact of the newly generated traffic.

The basic procedure followed is described as follows:

1) Calculate the generated trips for the proposed development consisting of a Drug Store w/ drive-thru, retail commercial floor space, and general office floor space. (See the Appendix Pages A-7 thru A-12)
2) Calculate trip distribution for the newly generated trips by this development. The proposed commercial trips distributed based on year 2012 population within a 2-mile radius of the project site as depicted in the Appendix of this report. Since the office trips are a minor component of the overall trip generation rate for this project, those trips were distributed in the same manner as the commercial trips.
3) Determine Trip Assignments for the newly generated trips based on the results of the Trip Distribution Analysis and logical routing to and from the site (See the Appendix Pages A-13 thru A-19 of this report).
4) Perform an AM Peak Hour and PM Peak Hour turning movement traffic count at the intersections of Tower Rd. / 98th, Sunset Gardens Rd. / 98th St. Existing turning movement counts for the intersection of Central Ave. / 98th St. analyzed in this report was obtained from recent traffic count data supplied by the consulting engineer.
5) Historic Growth Rates used in this report were calculated based on historic Traffic Flow Data obtained from MRCOG's Traffic Flow Maps. (See Appendix Pages A-20 thru A-28).
6) Grow the existing traffic volumes (turning movement counts) at the designated historic growth rate to the implementation year to obtain the projected 2012 AM and PM Peak Hour NO BUILD turning movement volumes. Also, add trips generated in other Traffic Impact Studies by previously approved projects including Southwest Mesa

Subdivisions and the Commercial Developments at the NE & NW corners of Central / 98th St.

7) Add in data from Trip Assignments Maps and Tables to the 2012 NO BUILD Volumes to obtain 2012 BUILD Volumes for this project.
8) Provide signalized and unsignalized intersection analyses for the following intersections:

INTERSECTION	TYPE CONTROL	NO BUILD	BUILD
1) Tower Rd. / 98th St.	Signalized	2012	2012
2) Central Ave. / 98th St.	Signalized	2012	2012
3) Sunset Gardens Rd. / 98th St.	Unsignalized	2012	2012
4) Driveway "A" / 98th St.	Unsignalized	N/A	2012
5) Sunset Gardens Rd. / Driveway "B"	Unsignalized	N/A	2012
6) Central Ave. / Driveway "C"	Unsignalized	N/A	2012
7) Driveway "D" / 98th St.	Unsignalized	N/A	2012

GENERAL AREA CHARACTERISTICS

The proposed development is located at the Southwest corner of Central Ave. / 98th St. The project is located along a primarily commercially / industrially zoned corridor on both sides of Central Ave. (See Zone Atlas on Page A-1 of the Appendix for additional zoning information).

AREA STREET NETWORK

98th St. is classified as a Principal Arterial roadway on the Long Range Roadway Plan for the Albuquerque Urban Area. 98th St. from I-40 south to Sage Rd. is a paved urban roadway 4-lane section.

Central Ave. is classified as a Principal Arterial Roadway on the Long Range Roadway Plan for the Albuquerque Urban Area. Central Ave. in the vicinity of this project is currently a four-lane rural paved roadway with a center median.

Sunset Gardens Rd. is not classified on the Long Range Roadway System Map for the Albuquerque Metropolitan Planning Area.

EXISTING TRAFFIC VOLUMES

2007 Average Weekday Traffic Volumes (AWDT) for the general transportation system in the site plan area are shown in the Appendix, Page A-5.

2007 / 2008 AM and PM Peak Hour Traffic Counts performed in conjunction with this report may be found in the Appendix.

NETWORK IMPROVEMENTS

There are no planned program improvements to the street network at this time. Improvements to the streets in the near future will be by developers of property adjacent to the streets.

EXISTING (2008) LEVELS OF SERVICE

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

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

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

EXISTING TRANSIT SERVICE

This area currently is serviced by City Bus (Rapid Ride) Route 54 (Bridge / Westgate Route) which services this area at 45 minute intervals from 6:00 am to 9:00 pm on weekdays and weekends. No other bus service is available at this time.

PROPOSED DEVELOPMENT

The subject area of land targeted for the commercial development plan totals approximately 8.5 acres. The associated trip generation rates as summarized in the following table:

Central / 98th St. Commercial Development - SW Corner

Trip Generation Data (ITE Trip Generation Manual - 8th Edition)

USE (ITE CODE)			24 HR VOL	A. M. PEAK HR.		P. M. PEAK HR.	
DESCRIPTION			*GROSS*	*ENTER*	*EXIT*	*ENTER*	*EXIT*
Summary Sheet	Units						
Walgreen's (Local Data)	16.51		2,064	37	26	136	142
Fast Food Restaurant w/ Drive-Thru Window (934)	6.31		3,131	159	153	111	102
Fast Food Restaurant w/ Drive-Thru Window (934)	4.82		2,391	121	117	85	78
Fast Food Restaurant w/ Drive-Thru Window (934)	5.30		2,629	133	128	93	86
Shopping Center (820)	12.00		1,712	27	17	75	78
General Office Building (710) - Less than 51,000 S.F.	12.00		177	22	3	5	24
Drive-In Bank (912)	5.00		696	27	20	67	70
Subtotal			**12,800**	**526**	**464**	**572**	**580**
Pass-by Trips		***30%***	(3840)	(158)	(139)	(172)	(174)
Total			**8,960**	**368**	**325**	**400**	**406**

See the conceptual site development plan on Page A-2 in the Appendix of this report to acquire more detailed information about the proposed development. This site plan is preliminary at this point in time and is subject to some changes as progress takes place in the design process. The plan should, however, provide a reliable basis upon which to analyze the impact of the development on the adjacent transportation system and provide guidelines for mitigating the impact and establishing access criteria. The conceptual site plan as it is shown in this report proposes two right-turn-in, right-turn-out access driveways – one onto Central Ave and one onto 98th St, one full-access driveway onto 98th St., and another full-access driveway on Sunset Gardens Rd. west of 98th St.

TRIP GENERATION

Projected trips were calculated from data in the Institute of Transportation Engineers Trip Generation report (7th Edition, 2003). Trips for the development were determined based on land uses defined on the Conceptual Site Development Plan on Page A-2 in the the Appendix of this report. The Trip Generation Summary can be seen on the preceding section or the Trip Generation Summary Table and Trip Generation Worksheets can be reviewed in the Appendix of this study.

TRIP DISTRIBUTION

Primary and Diverted Linked Trips:

Trips were distributed as follows:

Commercial / Office Land Use

Primary and diverted linked trips for the both the commercial land use and the office land use development were distributed proportionally to the 2012 projected population of Data Analysis Subzones within a two-mile radius of the proposed development. Population data for the years 2004 and 2030 were taken from the 2030 Socioeconomic Forecasts for Data Analysis Subzones for the Mid-Region of NM, S-03-01, supplied by the Mid-Region Council of Governments (MRCOG). Population data from the years 2004 and 2030 was interpolated (extrapolated) linearly to obtain 2012 population data to utilize for this analysis. Population Subzones were grouped based on the most likely major street(s) or route(s) to the subject development. The trip distribution worksheets and associated map of subareas and data analysis subzones is shown in the Appendix. The Trip Distribution Map for commercial land uses is shown in the Appendix, pg A-17.

TRIP ASSIGNMENTS

Trips were assigned to the transportation network in accordance with the results of the trip distribution analysis above and logical routing. Trip assignments utilized in this study are displayed on the Trip Assignments Maps in the Appendix on pages A-18 thru A-19.

BACKGROUND TRAFFIC GROWTH

Background traffic growth rates were considered for each individual approach to an intersection that was targeted for analysis based on data from the 2003, 2004, 2005, 2006, 2007 Traffic Flow maps prepared by the Mid-Region Council of Governments (MRCOG). Almost all of the Traffic Flow Data for those years taken from the MRCOG Traffic Flow Maps were Standard Data. The data from those years for each approach was plotted on a graph and a linear "regression trend line" calculated using the equation format $y=mx+b$. The growth rate was determined by calculating the average volume increase per year during the time period considered and dividing that volume into the most recent AWDT used in the analysis from which future volumes will be calculated. The rate of growth of that trend line was utilized as the growth rate for each approach if that calculated rate appeared feasible. However, there were some instances where the rate indicated a negative growth trend. In those cases, an appropriate growth rate from an adjacent segment of the same roadway was considered. Due to the potential for growth in the area, it was believed that a zero percent growth rate was inappropriate for this study. Additionally, if the R^2 value of the trend line was low, other means of establishing a probable growth rate from the data accumulated was considered. Historical Growth Rate Graphs with linear regression trendlines are shown in the the Appendix D. A Historic Growth Map can be found in the Appendix, pg. A-28. The growth rate utilized for each approach to an intersection is printed at the top of the Turning Movement sheets for each intersection (pp. A-31 thru A-44 in the Appendix).

PROJECTED PEAK HOUR TURNING MOVEMENTS FOR 2012 BUILDOUT

The calculated growth rates were applied to the 2007-2008 peak hour traffic counts and trips from previously approved (but not yet constructed) projects wer added in to establish the 2012 background traffic volumes. To these volumes, the generated trips based on implementation of the proposed Preliminary Site Development Plan were added to obtain BUILD volumes for the intersection analyses. See the Appendix for further information regarding turning movement counts.

INTERSECTION CAPACITY ANALYSIS

Intersection capacity analyses were performed in accordance with the procedures for signalized and unsignalized intersections utilized in the Synchro (Version 7, Build 755) Transportation System analysis software program as required by the New Mexico Department of Transportation. Synchro software deviates from the 2000 Highway Capacity Manual methods in several areas. The results obtained using Synchro software are generally deemed by the State to be close to those based on the 2000 Highway Capacity Manual in most cases.

For signalized intersections, the operational method of analysis was used for 2012 conditions (NO BUILD and BUILD). In addition to utilizing the operational analysis for the intersections, the planning method may also used to provide additional information at the intersection to help define critical lane volumes and to help analyze a solution.

Capacity analyses were performed for the following traffic conditions.

2012 without development of Proposed Project (No Build)
2012 with development of Proposed Project (Build)

RESULTS AND DISCUSSION OF INTERSECTION CAPACITY ANALYSES

Signalized Intersection Capacity Analysis

IMPLEMENTATION YEAR (2012)

Tower Rd. / 98th St. – Intersection #1 – Pages A-45 thru A-52

The results of the implementation year analysis of the signalized intersection of Central Tower Rd. / 98th St. are summarized in the following table:

Tower Rd. / 98th St.	2012 No Build		2012 BUILD	
	A.M.	P.M.	A.M.	P.M.
Existing Geometry	***D-41.5***	***B-15.8***	***E-59.3***	***B-19.3***
Make EBL Perm/Prot & SBR Perm/Overlap			***D-53.2***	***C-22.9***

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

Geometry used for this analysis of Tower Rd. / 98th St. is demonstrated in the following table:

Existing Geometry (Tower Rd. / 98th St.)

Approach	Left Turn Lanes	Thru/Lefts	Thru Lanes	Thru/Rights	Right Turn Lanes
EB Tower Rd.	1	0	1	1	0
WB Tower Rd.	1	0	2	0	1*
NB 98th St.	1	0	2	0	1*
SB 98th St.	1	0	2	0	1

* - Right Turn Lane by-passes the signal.

The analysis for the signalized intersection of Tower Rd. / 98th St. demonstrates that the intersection will operate at acceptable levels-of-service for all conditions except the AM BUILD condition, which will experience excessive delays. Mitigating the intersection by making the eastbound left turn permitted/protected and the southbound right turn permitted/overlap improves the level-of-service in the AM and increases the delay in the PM; however, both the AM and PM will experience acceptable levels of service.

The following table summarizes the results of the queuing analysis for the auxiliary lanes at the intersection:

Driveway "D"/ 98th St – Intersection #7 – Pages A-71 thru A-72

This intersection is proposed as a full access driveway. The results of the implementation year analysis of the unsignalized intersection of Driveway "D" / 98th St. are summarized in the following table:

	2012 BUILD	
	AM	PM
Driveway "D" / 98th St		
Minor Street (Driveway "D")		
EB Left	F-*	F-*
EB Right	B-11	B-14
Major Street (98th St.)		
NB Left	C-20	F-*

*-LOS > 180 seconds

The analysis for the unsignalized intersection of Driveway "D" / 98th St. demonstrates that the intersection will experience excessive delays for the eastbound left turn during the AM and PM Peak Hour BUILD conditions and for the northbound left turn during the PM Peak Hour Build condition. These delays on the side street (Driveway "D") are based on 2000 HCM methodology and do not take into account the fact that there are existing traffic signals to the north (Central Ave.) and to the south (Sunset Gardens Rd.). The presence of a signal to the north and to the south of Driveway "D" should create gaps in northbound and southbound traffic on 98th St., thus allowing traffic to turn left from Driveway "D" onto northbound 98th St. with greater ease than what is indicated in the table above. Thus, this analysis finds that the operation of Driveway "D" / 98th St. is probably better than what the analysis demonstrates given the location of existing signals on either side of the intersection; however the delays will still be excessive. Mitigating the intersection with a signal is not an option due to the close proximity to the signalized intersection of Central Ave. / 98th St.

Driveway "A" and Driveway "D" on the proposed site plan for the project should be relocated so that Driveway "D" (full access driveway) is located approximately 400 feet south of Central Ave. (centerline to centerline) and Driveway "A" is located approximately midway between Driveway "D" and Sunset Gardens Ave. Driveway "A" is recommended to be a right-in, right-out only driveway.

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

LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

Average Delay (secs)	Level-of-Service
≤ 10	A
> 10 and ≤ 20	B
> 20 and ≤ 35	C
> 35 and ≤ 55	D
> 55 and ≤ 80	E
> 80	F

LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

Average Delay (secs)	Level-of-Service
≤ 10	A
> 10 and ≤ 15	B
> 15 and ≤ 25	C
> 25 and ≤ 35	D
> 35 and ≤ 50	E
> 50	F

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

CONCLUSIONS

Based on projected traffic volumes for the year 2012, the operation of the signalized intersection of Central Ave. / 98th St. will be moderately impacted by the development of the proposed project at the Southwest corner of Central Ave. / 98th St., and the intersection of Tower Rd. / 98th St. will be minimally impacted by the implementation of this development. Based on the results of the analysis contained in this study, the implementation of the proposed Central Ave. / 98th St. Commercial Development (also called "Colucci Commercial Development) at the Southwest corner of Central Ave. / 98th St. will have no significant impact on the adjacent transportation system provided the following recommendations are followed:

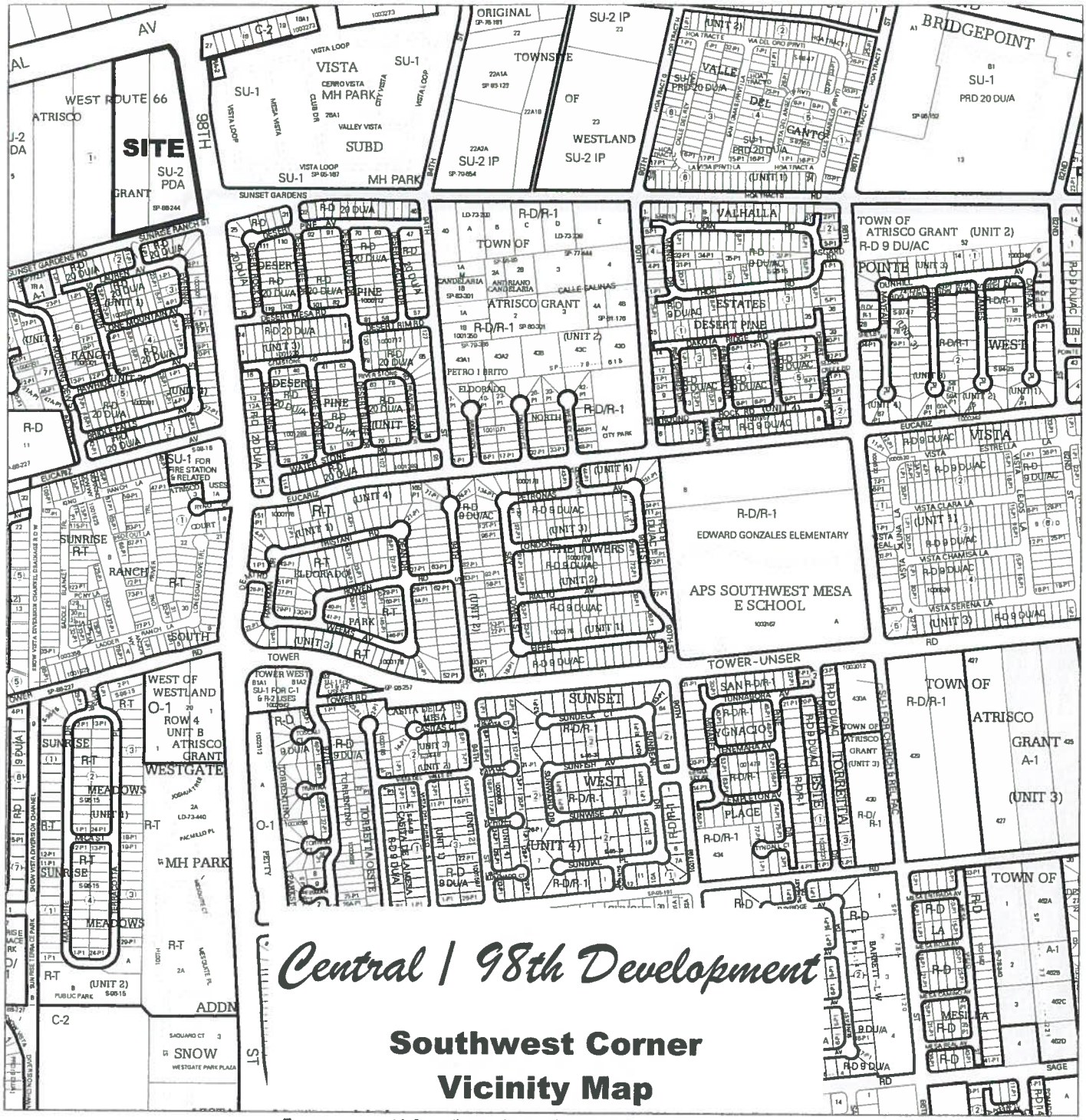
RECOMMENDATIONS

- All design and construction of onsite and offsite improvements associated with this project shall take necessary precautions to preserve and maintain adequate sight distances at all intersections and driveways on which the improvements are constructed.
- **Tower Rd. / 98th St.** – consideration should be given to making the eastbound left turn permitted/protected and the southbound right turn permitted/overlap
- **Central Ave. / 98th St.** – consideration should be given to implementing dual eastbound and dual westbound left turn lanes on Central Ave. beyond the implementation year (2012). The dual eastbound left turn lanes should be

constructed to a minimum length of 225 feet plus transition. The dual westbound left turn lanes should be constructed to a minimum length of 350 feet plus transition. The dual eastbound / westbound left turn lanes on Central Ave. should not be implemented until so authorized by the City of Albuquerque. It should be noted that dialog has occurred recently between the City of Albuquerque and other developers in this area regarding the need for the dual eastbound and westbound left turn lanes at this intersection. The City of Albuquerque has decided in those meetings that construction of dual eastbound and / or westbound left turn lanes on Central Ave. was not necessary. The projected level-of-service at Central Ave. / 98th St. associated with this analysis is "E" if single eastbound and westbound left turn lanes are maintained. This report finds that this condition is desireable since implementation of dual eastbound and / or westbound left turn lanes would likely increase delays at the intersection during the non-peak hours by virtue of the fact that it would force eastbound and westbound left turn movements to be limited to a protected left turn only. This report recommends that the City of Albuquerque defer implementation of the dual eastbound and / or westbound left turn lanes until beyond the year 2012.

- **Sunset Gardens Ave. / 98th St.** – provide striping for a new 150 feet long eastbound left turn lane on Sunset Gardens Ave. at 98th St.
- Four driveways should be constructed to serve this facility described as follows:
  - **Driveway "A"** – a right-in, right-out only unsignalized driveway accessing 98th St. approximately midway between Driveway "D" and Sunset Gardens Ave. It is proposed to construct a 120' long deceleration lane with reduced transition length due to the proximity of Driveway "D".
  - **Driveway "B"** – recommended to be a full access unsignalized driveway accessing Sunset Gardens Rd approximately 200 feet west of 98th St. (centerline to centerline).
  - **Driveway "C"** – a right-in, right-out only unsignalized driveway accessing Central Ave. approximately 350 feet west of 98th St. (centerline to centerline). An eastbound right turn deceleration lane on Central Ave. at Driveway "C" is warranted based on the projected volumes. The eastbound right turn lane is required to be a minimum length of 150 feet plus transition to conform to the City of Albuquerque's Development Process Manual (D.P.M.). However, there is an existing driveway on the adjacent property to the west approximately 75 feet west of the project's west property line. Thus, it is not feasible to construct the eastbound right turn lane on Central Ave.
  - **Driveway "D"** –a full access unsignalized driveway accessing 98th St. approximately 400 feet south of Central Ave. (centerline to centerline). A northbound left turn lane should be constructed on 98th St. at Driveway "D" to a minimum length of 250 feet plus transition. Even though the calculated length of the left turn queue is longer, the maximum length of left turn lane that can be constructed is approximately 250 feet long. Driveway "D" should be constructed with two eastbound exiting lanes (one for left turns and one for right turns, and one entering lane). A 150 feet long (plus transition) southbound right turn deceleration lane should be constructed at Driveway "D".

Appendix



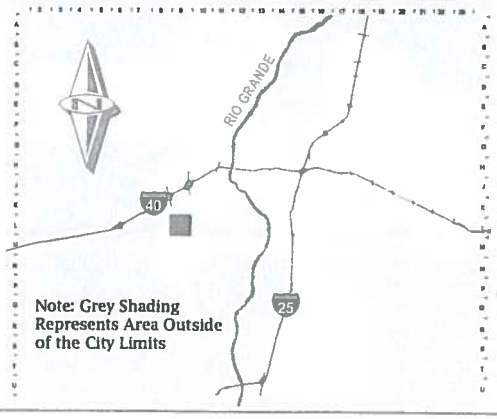
Central / 98th Development

Southwest Corner Vicinity Map

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

Albuquerque Geographic Information System

Map amended through: 6/13/2008



Note: Grey Shading Represents Area Outside of the City Limits

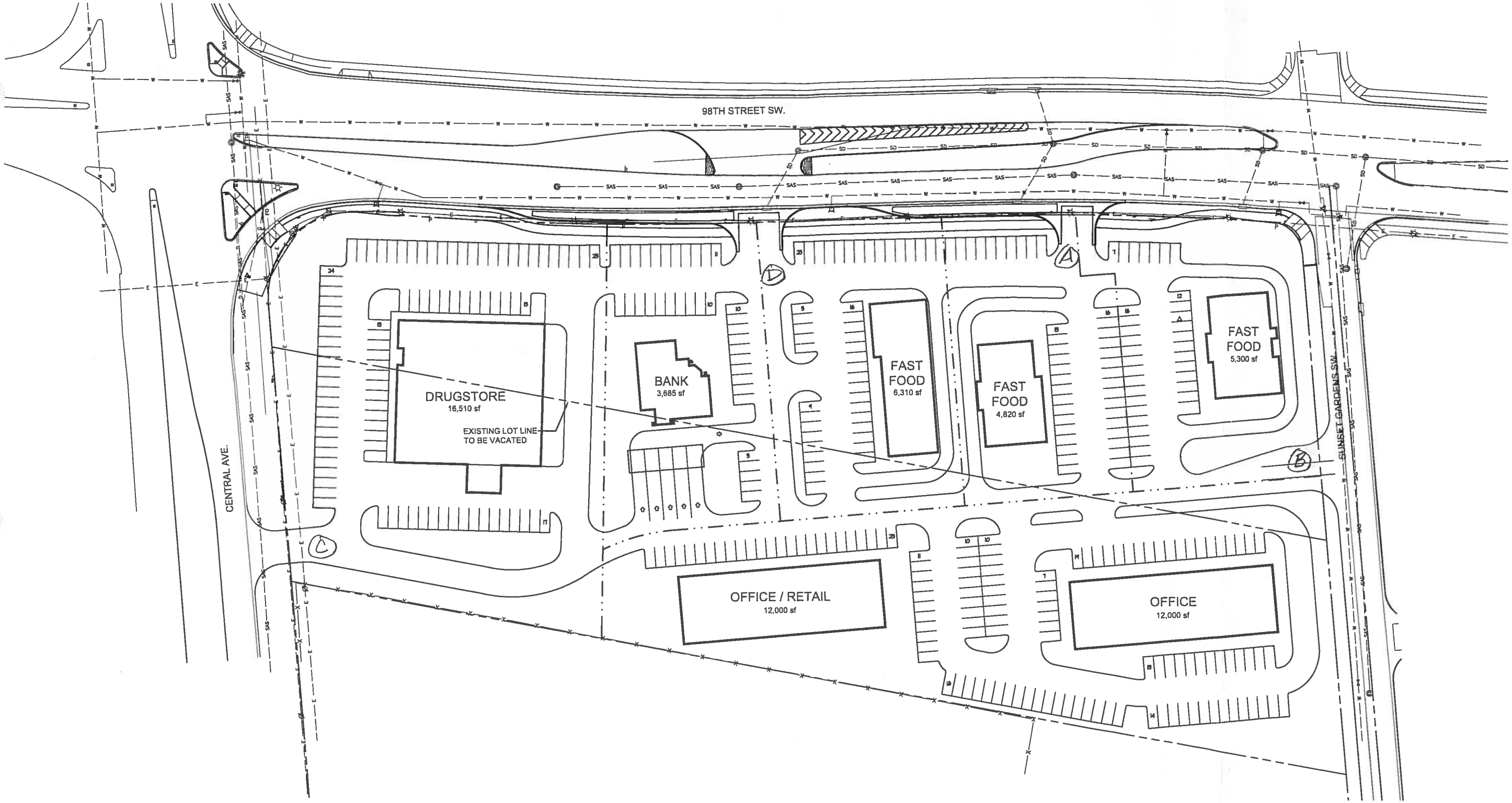
Zone Atlas Page:

L-09-Z

Selected Symbols

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

0 750 1,500 Feet



MERCADO CAMINO 66

98TH STREET AND CENTRAL AVENUE

ILLUSTRATIVE SITE PLAN

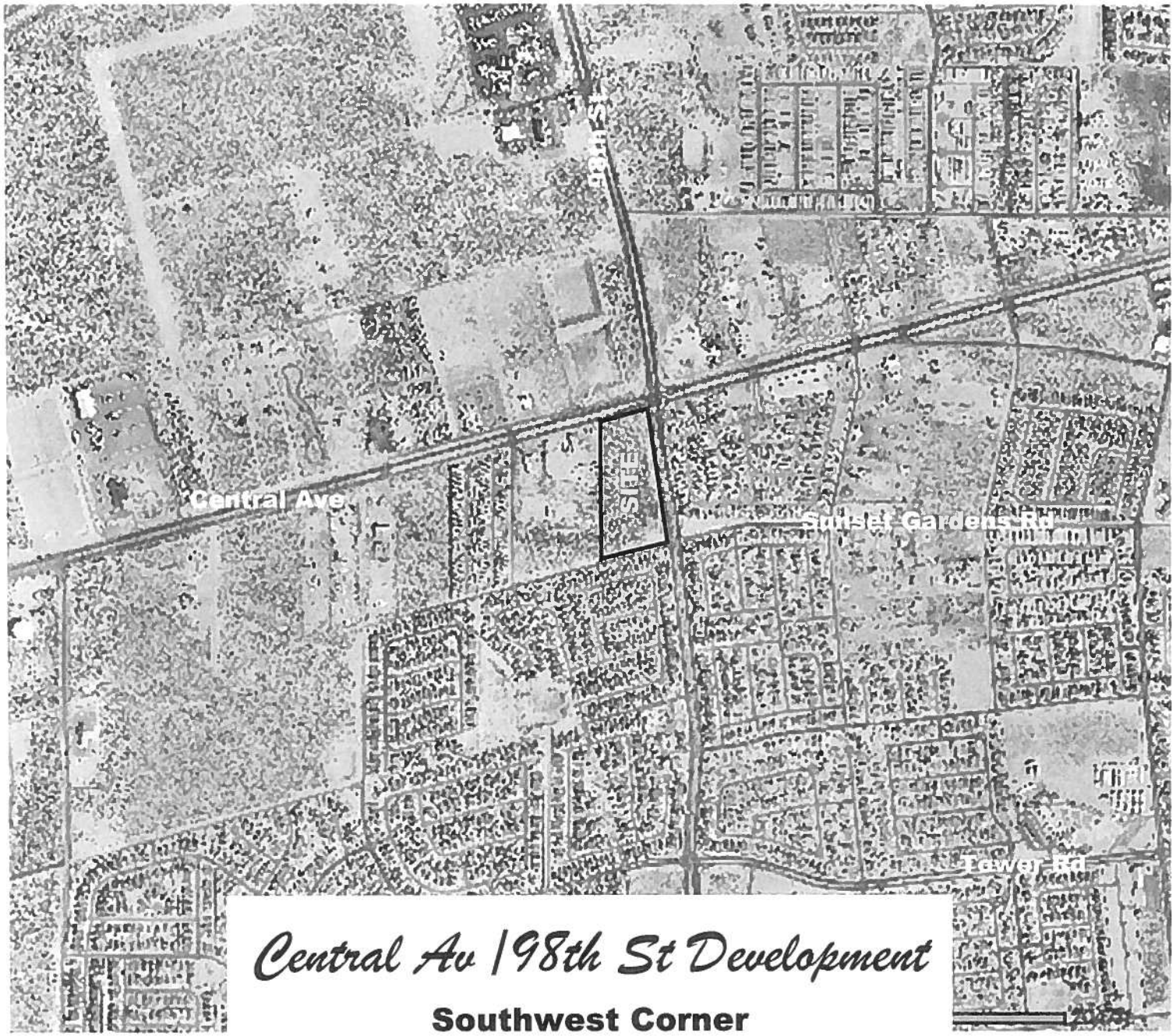
NORTH 20 0 40 80

APRIL 2, 2009

CONSENSUS PLANNING, INC.
Planning / Landscape Architecture
302 Eighth Street NW
Albuquerque, NM 87102
(505) 764-9801 Fax 842-5495
e-mail: cp@consensusplanning.com

LARKIN GROUP NM, INC.
CONSULTING ENGINEERS AND SURVEYORS
ALBUQUERQUE NEW MEXICO

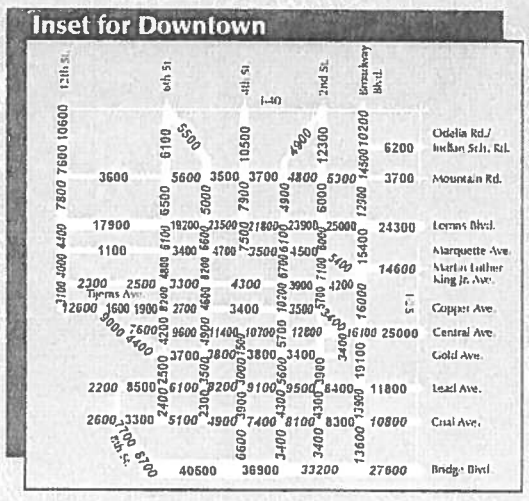

Central Ave.
98th St.
COLUCCI
DEVELOPMENT
Sunset Gardens Rd.
Sunrise
Beach
St.
GRAPHIC SCALE
200
0
100
200
400
800
(IN FEET)
1 inch = 200 ft.

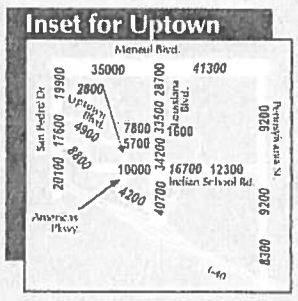


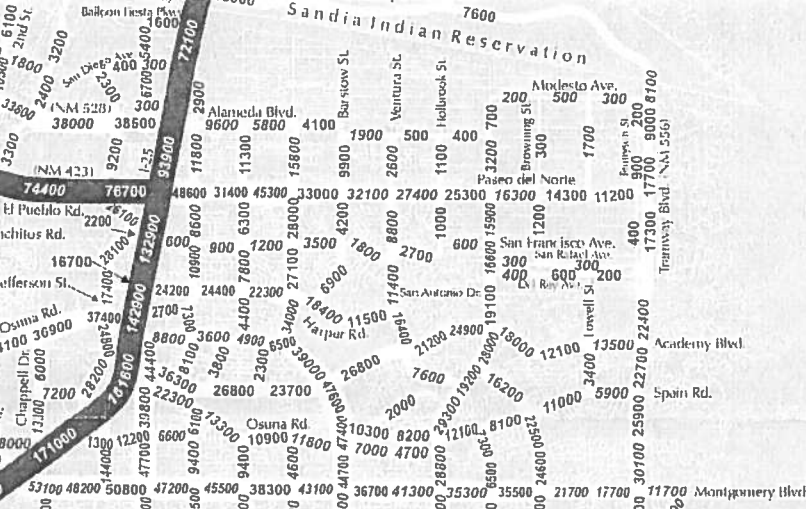
Central Av 198th St Development

Southwest Corner

Aerial Photo - 2006







Average Weekday Traffic Flows

- 0 - 900
- 1000 - 4900
- 5000 - 14900
- 15000 - 24900
- 25000 - 34900
- 35000 - 44900
- 45000 - 54900
- 55000 - 194900

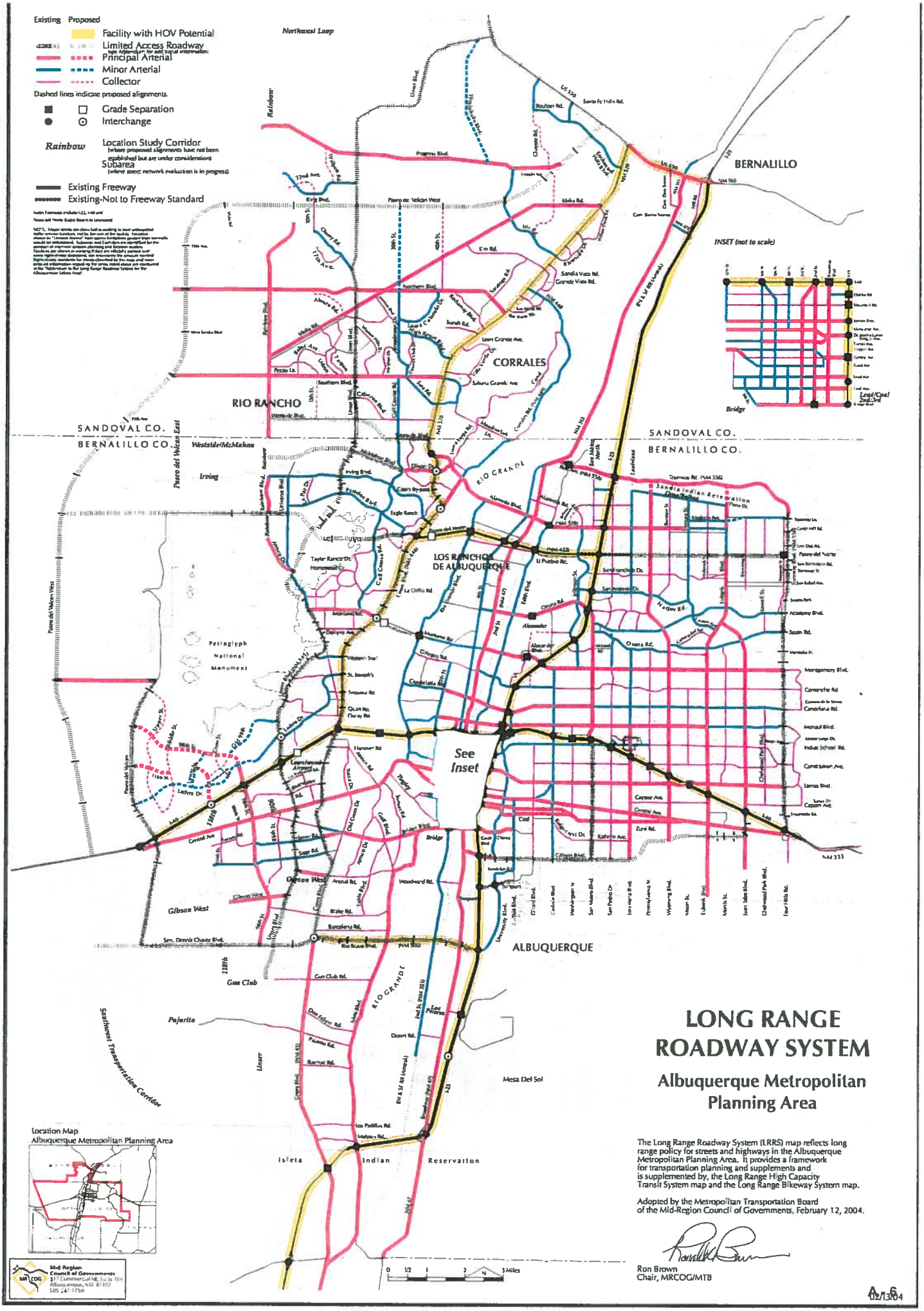
Standard Data 9500 — Link Volume is based on traffic count data accepted by the NM Department of Transportation Traffic Monitoring System (TMS) as standard in accordance with the New Mexico State Traffic Monitoring Standards (NMSTMS).

Non-Standard Data 9500 — Link Volume is based either on traffic count data not in compliance with the NMSTMS or on professional judgement. NMDOT recommends that nonstandard data be used with caution.

0 1 2 3 4 Miles

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

2007 Traffic Flows
for the Greater Albuquerque Area



LONG RANGE ROADWAY SYSTEM

Albuquerque Metropolitan Planning Area

The Long Range Roadway System (LRRS) map reflects long range policy for streets and highways in the Albuquerque Metropolitan Planning Area. It provides a framework for transportation planning and supplements and is supplemented by, the Long Range High Capacity Transit System map and the Long Range Bikeway System map.

Adopted by the Metropolitan Transportation Board of the Mid-Region Council of Governments, February 12, 2004.

Ron Brown
Chair, MRCOG/MTB

Mid-Region Council of Governments
809 Copper Ave. NW
Albuquerque, NM 87102
505.247.1750

A-6

02/13/04

Central / 98th St. Commercial Development - SW Corner

Trip Generation Data (ITE Trip Generation Manual - 8th Edition)

USE (ITE CODE)		24 HOUR TWO-WAY VOLUME	A. M. PEAK HOUR		P. M. PEAK HOUR	
		GROSS	ENTER	EXIT	ENTER	EXIT
	Units					
Walgreen's (Local Data)	***16.51***	2,064	37	26	136	142
	1,000 S.F.					

ITE Trip Generation Equations:

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

T = ***125*** **(X) +** ***0***
50% Enter, ***50%*** Exit

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

T = ***3.79*** **(X) +** ***0***
59% Enter, ***41%*** Exit

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

T = ***16.82*** **(X) +** ***0***
49% Enter, ***51%*** Exit

Comments:
Tract No.

Based on ITE Trip Generation Manual - 8th Edition

Central / 98th St. Commercial Development - SW Corner

Trip Generation Data (ITE Trip Generation Manual - 8th Edition)

USE (ITE CODE)		24 HOUR TWO-WAY VOLUME	A. M. PEAK HOUR		P. M. PEAK HOUR	
		GROSS	ENTER	EXIT	ENTER	EXIT
	Units					
Fast Food Restaurant w/ Drive-Thru Window (934)	***6.31***	3,131	159	153	111	102
	1,000 S.F.					

ITE Trip Generation Equations:

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

T = ***496.12*** (X) + ***0***

50% Enter, ***50%*** Exit

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

T = ***49.35*** (X) + ***0***

51% Enter, ***49%*** Exit

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

T = ***33.84*** (X) + ***0***

52% Enter, ***48%*** Exit

Comments:
Tract No.

Based on ITE Trip Generation Manual - 8th Edition

Central / 98th St. Commercial Development - SW Corner

Trip Generation Data (ITE Trip Generation Manual - 8th Edition)

USE (ITE CODE)	Units	24 HOUR TWO-WAY VOLUME	A. M. PEAK HOUR		P. M. PEAK HOUR	
		GROSS	ENTER	EXIT	ENTER	EXIT
Fast Food Restaurant w/ Drive-Thru Window (934)	***4.82*** **1,000 S.F.**	2,391	121	117	85	78

ITE Trip Generation Equations:

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

T = ***496.12*** **(X) +** ***0***
50% Enter, ***50%*** Exit

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

T = ***49.35*** **(X) +** ***0***
51% Enter, ***49%*** Exit

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

T = ***33.84*** **(X) +** ***0***
52% Enter, ***48%*** Exit

Comments:
Tract No.

Based on ITE Trip Generation Manual - 8th Edition

Central / 98th St. Commercial Development - SW Corner

Trip Generation Data (ITE Trip Generation Manual - 8th Edition)

USE (ITE CODE)		24 HOUR TWO-WAY VOLUME	A. M. PEAK HOUR		P. M. PEAK HOUR	
		GROSS	ENTER	EXIT	ENTER	EXIT
	Units					
Fast Food Restaurant w/ Drive-Thru Window (934)	***5.30***	2,629	133	128	93	86
	1,000 S.F.					

ITE Trip Generation Equations:

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

T = ***496.12*** **(X) +** ***0***
50% Enter, ***50%*** Exit

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

T = ***49.35*** **(X) +** ***0***
51% Enter, ***49%*** Exit

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

T = ***33.84*** **(X) +** ***0***
52% Enter, ***48%*** Exit

Comments:
Tract No.

Based on ITE Trip Generation Manual - 8th Edition

Central / 98th St. Commercial Development - SW Corner

Trip Generation Data (ITE Trip Generation Manual - 8th Edition)

USE (ITE CODE)		24 HOUR TWO-WAY VOLUME	A. M. PEAK HOUR		P. M. PEAK HOUR	
		GROSS	ENTER	EXIT	ENTER	EXIT
	Units					
Shopping Center (820)	*12.00*	1,712	27	17	75	78
	1,000 S.F.					

ITE Trip Generation Equations:

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

Ln(T) = *0.65* Ln(X) + *5.83*

50% Enter, *50%* Exit

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

Ln(T) = *0.59* Ln(X) + *2.32*

61% Enter, *39%* Exit

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

Ln(T) = *0.67* Ln(X) + *3.37*

49% Enter, *51%* Exit

Comments:
Tract No.

Based on ITE Trip Generation Manual - 8th Edition

Central / 98th St. Commercial Development - SW Corner

Trip Generation Data (ITE Trip Generation Manual - 8th Edition)

USE (ITE CODE)		24 HOUR TWO-WAY VOLUME	A. M. PEAK HOUR		P. M. PEAK HOUR	
		GROSS	ENTER	EXIT	ENTER	EXIT
	Units					
General Office Building (710) - Less than 51,000 S.F.	***12.00***	177	22	3	5	24
	1,000 S.F.					

ITE Trip Generation Equations:

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

T = ***14.729*** **(X) +** ***0***
50% Enter, ***50%*** Exit

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

T = ***2.055*** **(X) +** ***0***
88% Enter, ***12%*** Exit

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

T = ***2.369*** **(X) +** ***0***
17% Enter, ***83%*** Exit

Comments:
Tract No.

Based on ITE Trip Generation Manual - 8th Edition

A-12a

Central / 98th St. Commercial Development - SW Corner

Trip Generation Data (ITE Trip Generation Manual - 8th Edition)

USE (ITE CODE)		24 HOUR TWO-WAY VOLUME	A. M. PEAK HOUR		P. M. PEAK HOUR	
		GROSS	ENTER	EXIT	ENTER	EXIT
	Units					
Drive-In Bank (912)	*5.00*	696	27	20	67	70
	Drive-In Lanes					

ITE Trip Generation Equations:

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

T = *139.25* (X) + *0*

50% Enter, *50%* Exit

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

T = *9.44* (X) + *0*

58% Enter, *42%* Exit

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

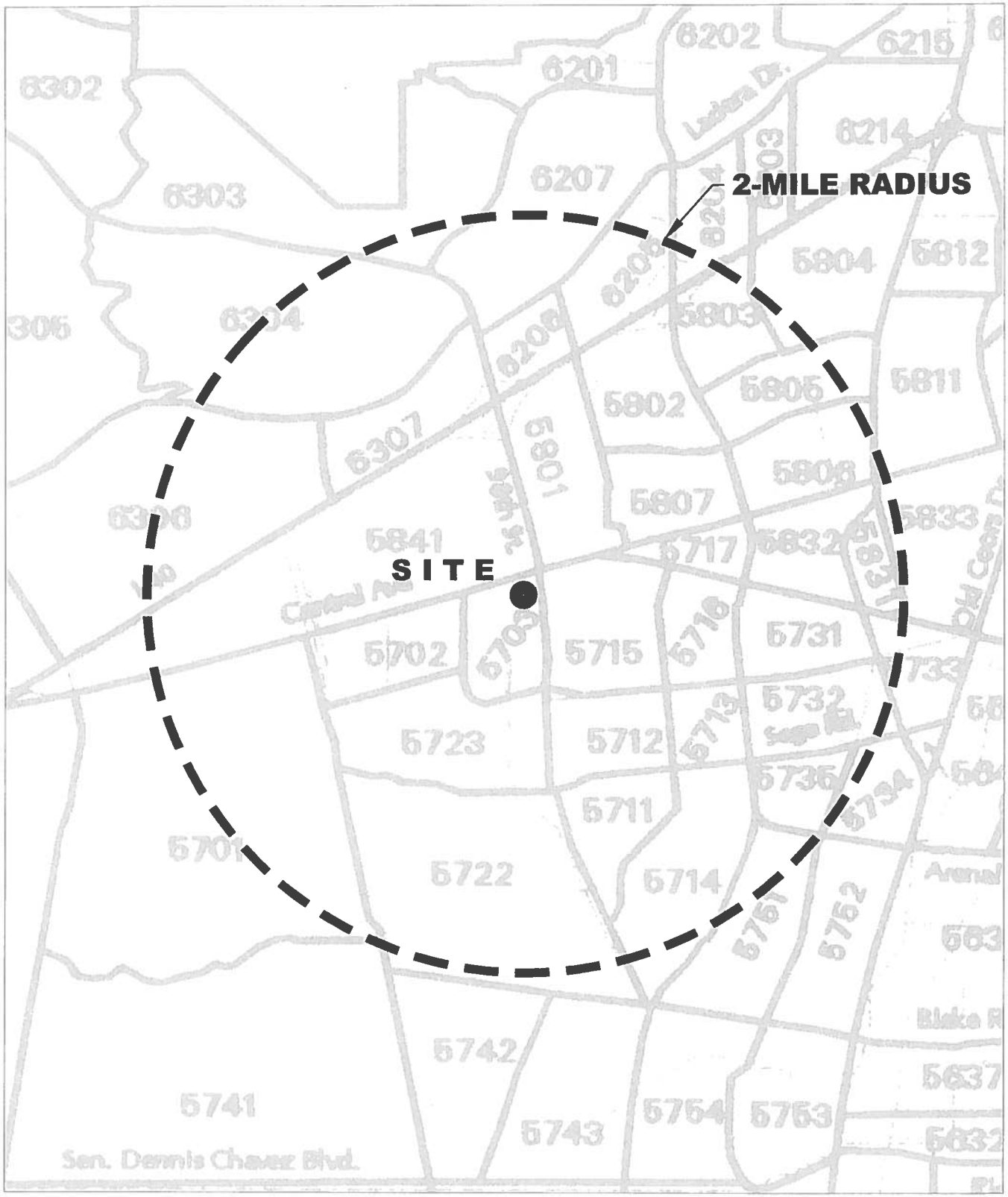
T = *27.41* (X) + *0*

49% Enter, *51%* Exit

Comments:
Tract No.

Based on ITE Trip Generation Manual - 8th Edition

A-126



DATA ANALYSIS SUBZONE (DASZ) MAP

Central / 98th St Development (Southwest Corner)

Trip Distribution Table

Central / 98th St Development (Southwest Corner)

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

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

							(9N) 98th St North			(CE) Central Av East			(SE) Sunset Gardens Rd East		
DASZ #	% Sub Area in Study	2004 Population	2030 Population	Interpolated Population for the Year	Population in Study	Percent Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population
		2004	2030	2012											
Boundary Specified on DASZ Map															
5701	45%	1345	2017	1,552	698	1.84%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5702	100%	49	58	52	52	0.14%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5703	100%	1890	1762	1,851	1,851	4.89%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5711	100%	1703	1658	1,689	1,689	4.46%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5712	100%	1881	1992	1,915	1,915	5.06%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5713	100%	409	733	509	509	1.34%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5714	90%	3963	4264	4,056	3,650	9.64%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5715	100%	2515	2774	2,595	2,595	6.85%	0%	0.00%	0	10%	0.69%	260	40%	2.74%	1,038
5716	100%	1795	2263	1,939	1,939	5.12%	0%	0.00%	0	0%	0.00%	0	70%	3.59%	1,357
5717	100%	3	350	110	110	0.29%	0%	0.00%	0	100%	0.29%	110	0%	0.00%	0
5722	90%	4878	9670	6,352	5,717	15.10%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5723	100%	3993	4116	4,031	4,031	10.65%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5731	100%	1010	1063	1,026	1,026	2.71%	0%	0.00%	0	100%	2.71%	1,026	0%	0.00%	0
5732	95%	127	758	321	305	0.81%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5733	15%	110	220	144	22	0.06%	0%	0.00%	0	100%	0.06%	22	0%	0.00%	0
5734	10%	384	918	548	55	0.15%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5735	100%	1608	1491	1,572	1,572	4.15%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5751	25%	3362	3151	3,297	824	2.18%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5801	100%	542	926	660	660	1.74%	75%	1.31%	495	25%	0.44%	165	0%	0.00%	0
5802	100%	467	432	456	456	1.20%	0%	0.00%	0	100%	1.20%	456	0%	0.00%	0
5803	95%	0	0	0	0	0.00%	50%	0.00%	0	50%	0.00%	0	0%	0.00%	0
5804	5%	1983	2412	2,115	106	0.28%	100%	0.28%	106	0%	0.00%	0	0%	0.00%	0
5805	80%	79	97	85	68	0.18%	0%	0.00%	0	100%	0.18%	68	0%	0.00%	0
5806	95%	609	635	617	586	1.55%	0%	0.00%	0	100%	1.55%	586	0%	0.00%	0
5807	100%	737	1424	948	948	2.50%	0%	0.00%	0	100%	2.50%	948	0%	0.00%	0
5831	100%	609	635	617	617	1.63%	0%	0.00%	0	100%	1.63%	617	0%	0.00%	0
5832	100%	1214	1283	1,235	1,235	3.26%	0%	0.00%	0	100%	3.26%	1,235	0%	0.00%	0
5833	5%	3608	3385	3,539	177	0.47%	0%	0.00%	0	100%	0.47%	177	0%	0.00%	0
5841	90%	479	438	466	419	1.11%	25%	0.28%	105	0%	0.00%	0	0%	0.00%	0
6204	10%	1209	1357	1,255	126	0.33%	100%	0.33%	126	0%	0.00%	0	0%	0.00%	0
6205	70%	1331	1312	1,325	928	2.45%	100%	2.45%	928	0%	0.00%	0	0%	0.00%	0
6206	100%	0	854	263	263	0.69%	100%	0.69%	263	0%	0.00%	0	0%	0.00%	0
6207	45%	1998	4709	2,832	1,274	3.37%	100%	3.37%	1,274	0%	0.00%	0	0%	0.00%	0
6303	5%	0	2684	826	41	0.11%	100%	0.11%	41	0%	0.00%	0	0%	0.00%	0
6304	50%	0	4261	1,311	656	1.73%	100%	1.73%	656	0%	0.00%	0	0%	0.00%	0
6306	45%	0	2093	644	290	0.77%	100%	0.77%	290	0%	0.00%	0	0%	0.00%	0
6307	100%	0	1460	449	449	1.19%	100%	1.19%	449	0%	0.00%	0	0%	0.00%	0
				53,202	37,859	100.00%			4,733			5,670			2,395
									12.50%			14.98%			6.33%

Trip Distribution Table

Central / 98th St Development (Southwest Corner)

Data Analysis Subzone Population Data for determination of Local Trip Distribution for Proposed **Retail Commercial**

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

							(9C) 98th St Central			(TE) Tower Rd East			(9S) 98th St South		
DASZ #	% Sub Area in Study	2004 Population	2030 Population	Interpolated Population for the Year	Population in Study	Percent Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population
		2004	2030	2012											
Boundary Specified on DASZ Map															
5701	45%	1345	2017	1,552	698	1.84%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5702	100%	49	58	52	52	0.14%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5703	100%	1890	1762	1,851	1,851	4.89%	10%	0.49%	185	0%	0.00%	0	0%	0.00%	0
5711	100%	1703	1658	1,689	1,689	4.46%	0%	0.00%	0	0%	0.00%	0	100%	4.46%	1,689
5712	100%	1881	1992	1,915	1,915	5.06%	0%	0.00%	0	50%	2.53%	958	50%	2.53%	958
5713	100%	409	733	509	509	1.34%	0%	0.00%	0	100%	1.34%	509	0%	0.00%	0
5714	90%	3963	4264	4,056	3,650	9.64%	0%	0.00%	0	0%	0.00%	0	100%	9.64%	3,650
5715	100%	2515	2774	2,595	2,595	6.85%	10%	0.69%	260	40%	2.74%	1,038	0%	0.00%	0
5716	100%	1795	2263	1,939	1,939	5.12%	0%	0.00%	0	30%	1.54%	582	0%	0.00%	0
5717	100%	3	350	110	110	0.29%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5722	90%	4878	9670	6,352	5,717	15.10%	0%	0.00%	0	0%	0.00%	0	75%	11.33%	4,288
5723	100%	3993	4116	4,031	4,031	10.65%	0%	0.00%	0	50%	5.32%	2,016	50%	5.32%	2,016
5731	100%	1010	1063	1,026	1,026	2.71%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5732	95%	127	758	321	305	0.81%	0%	0.00%	0	0%	0.00%	0	100%	0.81%	305
5733	15%	110	220	144	22	0.06%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5734	10%	384	918	548	55	0.15%	0%	0.00%	0	0%	0.00%	0	100%	0.15%	55
5735	100%	1608	1491	1,572	1,572	4.15%	0%	0.00%	0	0%	0.00%	0	100%	4.15%	1,572
5751	25%	3362	3151	3,297	824	2.18%	0%	0.00%	0	0%	0.00%	0	100%	2.18%	824
5801	100%	542	926	660	660	1.74%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5802	100%	467	432	456	456	1.20%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5803	95%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5804	5%	1983	2412	2,115	106	0.28%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5805	80%	79	97	85	68	0.18%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5806	95%	609	635	617	586	1.55%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5807	100%	737	1424	948	948	2.50%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5831	100%	609	635	617	617	1.63%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5832	100%	1214	1283	1,235	1,235	3.26%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5833	5%	3608	3385	3,539	177	0.47%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5841	90%	479	438	466	419	1.11%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6204	10%	1209	1357	1,255	126	0.33%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6205	70%	1331	1312	1,325	928	2.45%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6206	100%	0	854	263	263	0.69%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6207	45%	1998	4709	2,832	1,274	3.37%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6303	5%	0	2684	826	41	0.11%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6304	50%	0	4261	1,311	656	1.73%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6306	45%	0	2093	644	290	0.77%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6307	100%	0	1460	449	449	1.19%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
				53,202	37,859	100.00%			445			5,102			15,356
									1.17%			13.48%			40.56%

Trip Distribution Table

Central / 98th St Development (Southwest Corner)

Data Analysis Subzone Population Data for determination of Local Trip Distribution for Proposed **Retail Commercial**

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

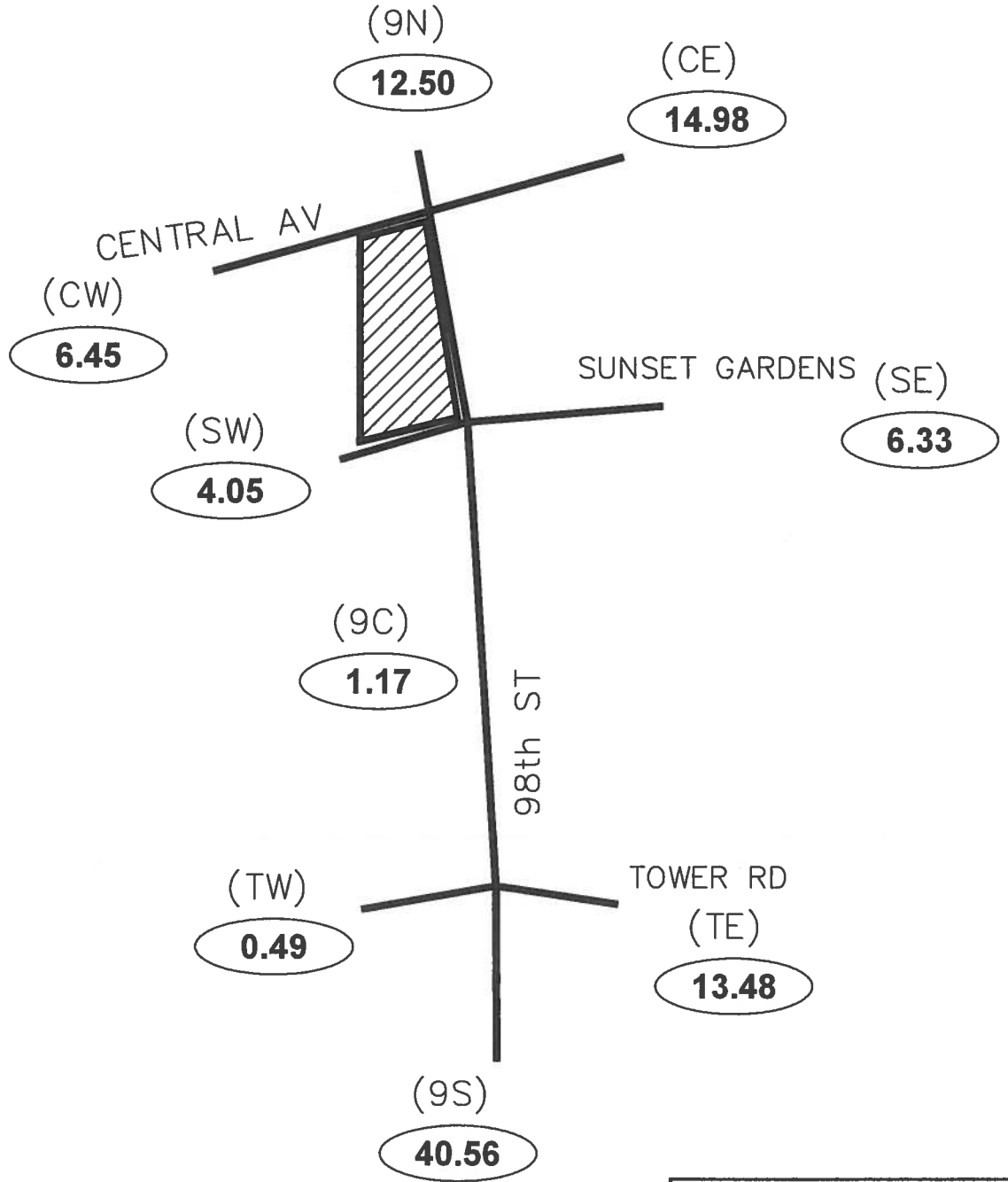
							(TW) Tower Rd West			(SW) Sunset Gardens Rd West			(CW) Central Av West		
DASZ #	% Sub Area in Study	2004 Population	2030 Population	Interpolated Population for the Year	Population In Study	Percent Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population
		2004	2030	2012											
Boundary Specified on DASZ Map															
5701	45%	1345	2017	1,552	698	1.84%	0%	0.00%	0	0%	0.00%	0	100%	1.84%	698
5702	100%	49	58	52	52	0.14%	0%	0.00%	0	100%	0.14%	52	0%	0.00%	0
5703	100%	1890	1762	1,851	1,851	4.89%	10%	0.49%	185	80%	3.91%	1,481	0%	0.00%	0
5711	100%	1703	1658	1,689	1,689	4.46%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5712	100%	1881	1992	1,915	1,915	5.06%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5713	100%	409	733	509	509	1.34%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5714	90%	3963	4264	4,056	3,650	9.64%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5715	100%	2515	2774	2,595	2,595	6.85%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5716	100%	1795	2263	1,939	1,939	5.12%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5717	100%	3	350	110	110	0.29%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5722	90%	4878	9670	6,352	5,717	15.10%	0%	0.00%	0	0%	0.00%	0	25%	3.78%	1,429
5723	100%	3993	4116	4,031	4,031	10.65%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5731	100%	1010	1063	1,026	1,026	2.71%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5732	95%	127	758	321	305	0.81%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5733	15%	110	220	144	22	0.06%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5734	10%	384	918	548	55	0.15%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5735	100%	1608	1491	1,572	1,572	4.15%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5751	25%	3362	3151	3,297	824	2.18%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5801	100%	542	926	660	660	1.74%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5802	100%	467	432	456	456	1.20%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5803	95%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5804	5%	1983	2412	2,115	106	0.28%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5805	80%	79	97	85	68	0.18%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5806	95%	609	635	617	586	1.55%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5807	100%	737	1424	948	948	2.50%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5831	100%	609	635	617	617	1.63%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5832	100%	1214	1283	1,235	1,235	3.26%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5833	5%	3608	3385	3,539	177	0.47%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5841	90%	479	438	466	419	1.11%	0%	0.00%	0	0%	0.00%	0	75%	0.83%	314
6204	10%	1209	1357	1,255	126	0.33%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6205	70%	1331	1312	1,325	928	2.45%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6206	100%	0	854	263	263	0.69%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6207	45%	1998	4709	2,832	1,274	3.37%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6303	5%	0	2684	826	41	0.11%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6304	50%	0	4261	1,311	656	1.73%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6306	45%	0	2093	644	290	0.77%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6307	100%	0	1460	449	449	1.19%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
				53,202	37,859	100.00%			185			1,533			2,442
									0.49%			4.05%			6.45%

Central / 98th St Development

(Southwest Corner)

Trip Distribution Map (%)

NTS



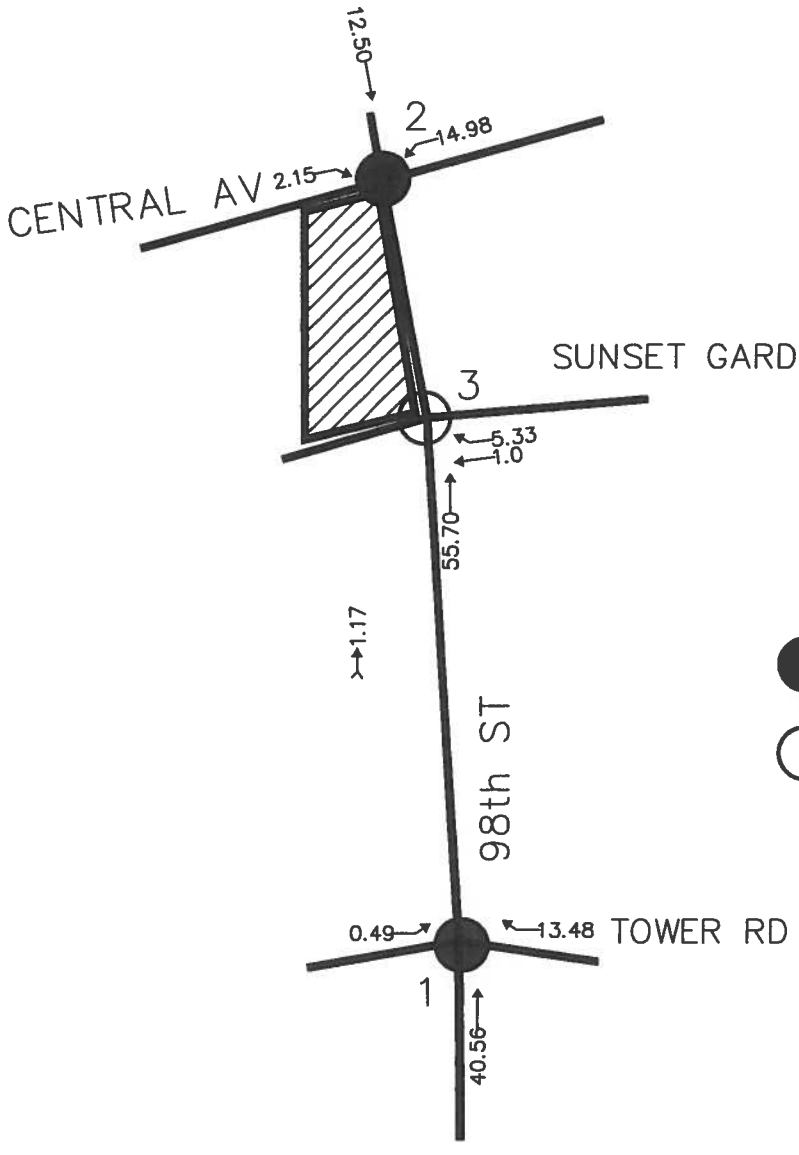
Terry O. Brown, P.E.
P.O. Box 92051
Albuquerque, NM 87199-2051
(505)883-8807 (Voice)
(505)212-0267 (Fax)

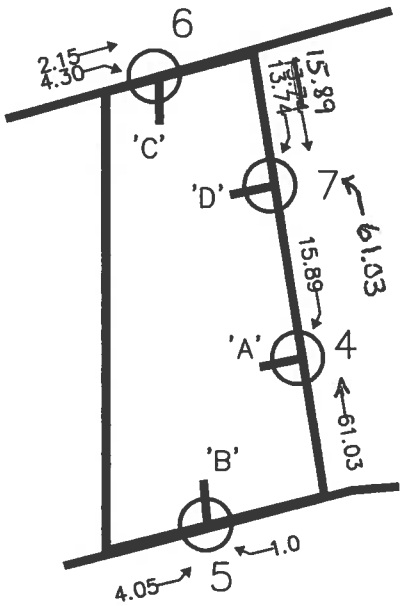
Central / 98th St Development

(Southwest Corner)

Trip Assignments (% Entering)

NTS





DRIVEWAY DETAIL

SIGNALIZED INTERSECTION

UNSIGNALIZED INTERSECTION

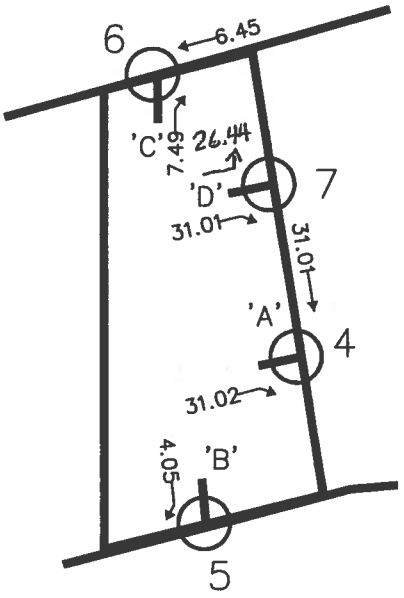
Terry O. Brown, P.E.
P.O. Box 92051
Albuquerque, NM 87199-2051
(505)883-8807 (Voice)
(505)212-0267 (Fax)

Central / 98th St Development

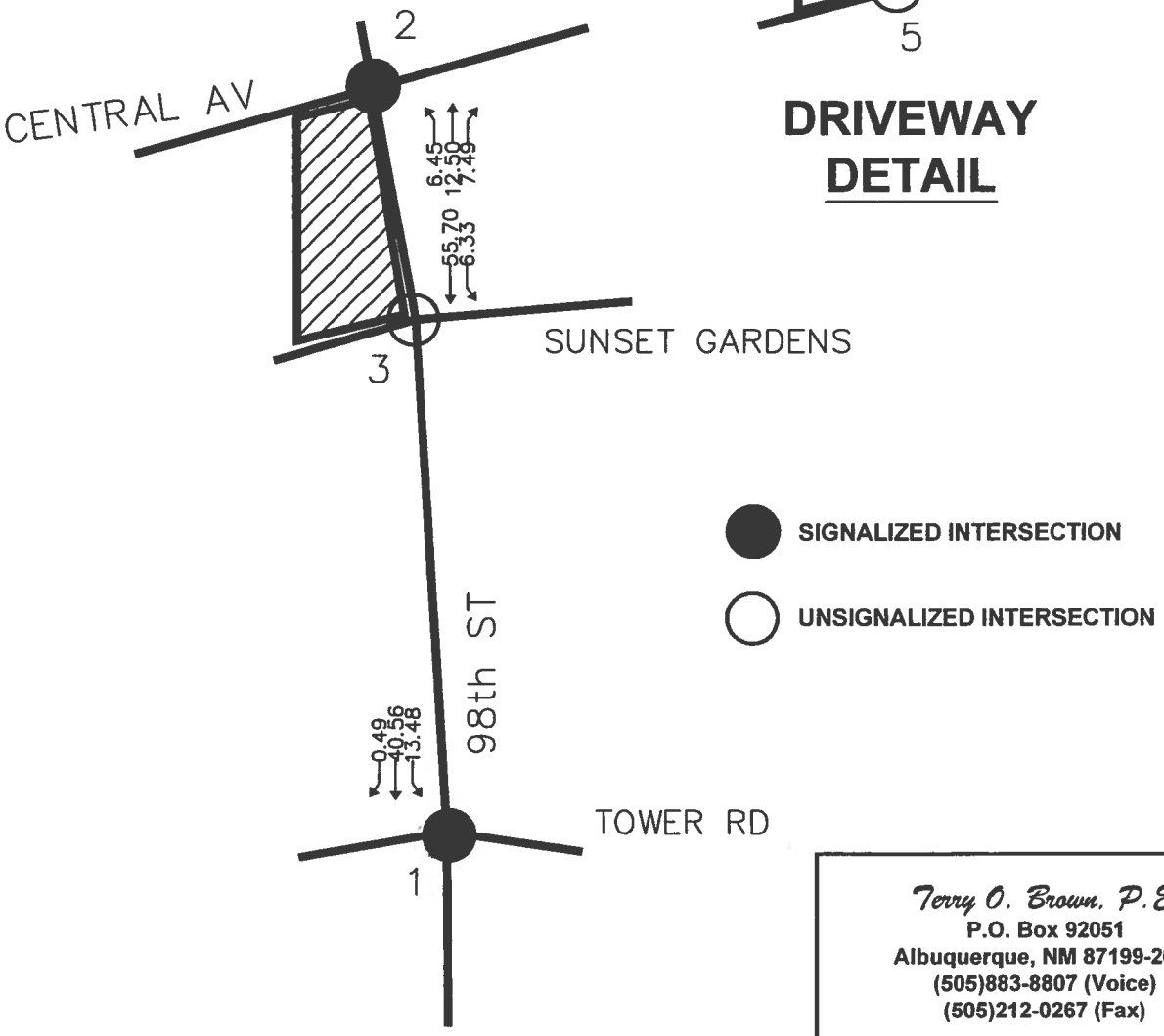
(Southwest Corner)

Trip Assignments (% Exiting)

NTS



DRIVEWAY DETAIL



Terry O. Brown, P.E.
P.O. Box 92051
Albuquerque, NM 87199-2051
(505)883-8807 (Voice)
(505)212-0267 (Fax)

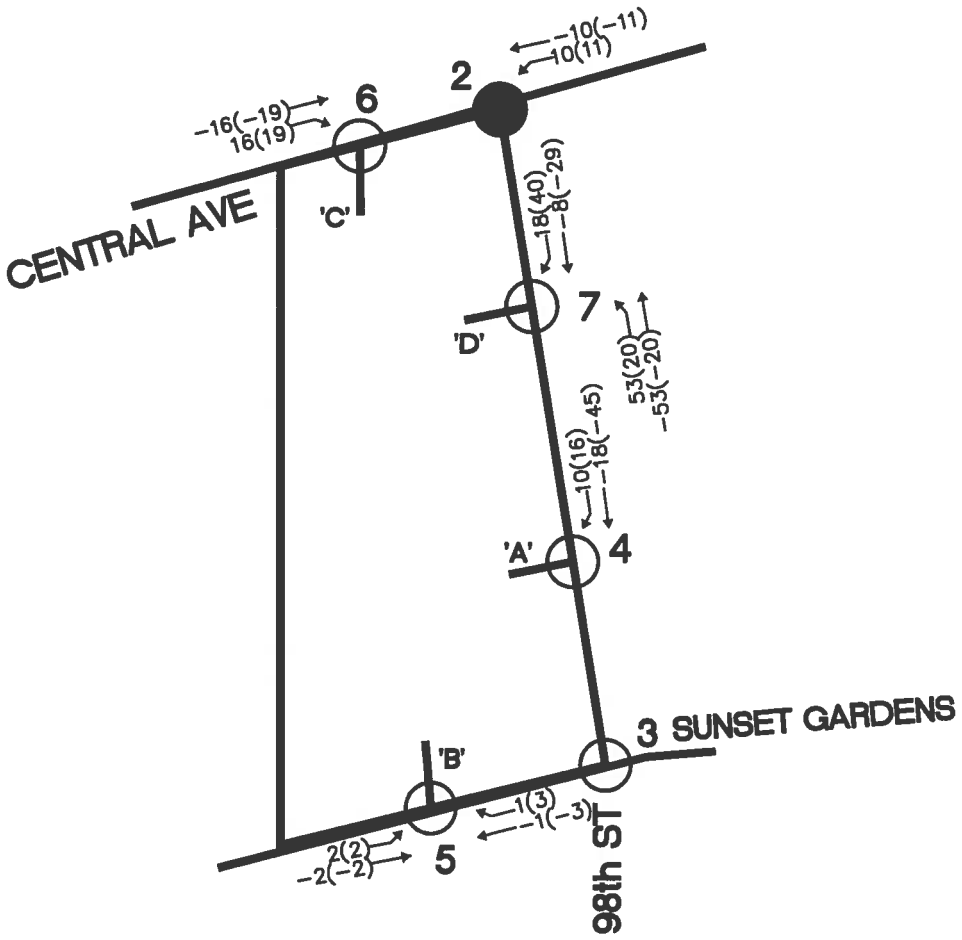
Central / 98th St Development

(Southwest Corner)

Pass-by Trip Assignments (% Entering)

NORTH

NTS



SIGNALIZED INTERSECTION

UNSIGNALIZED INTERSECTION

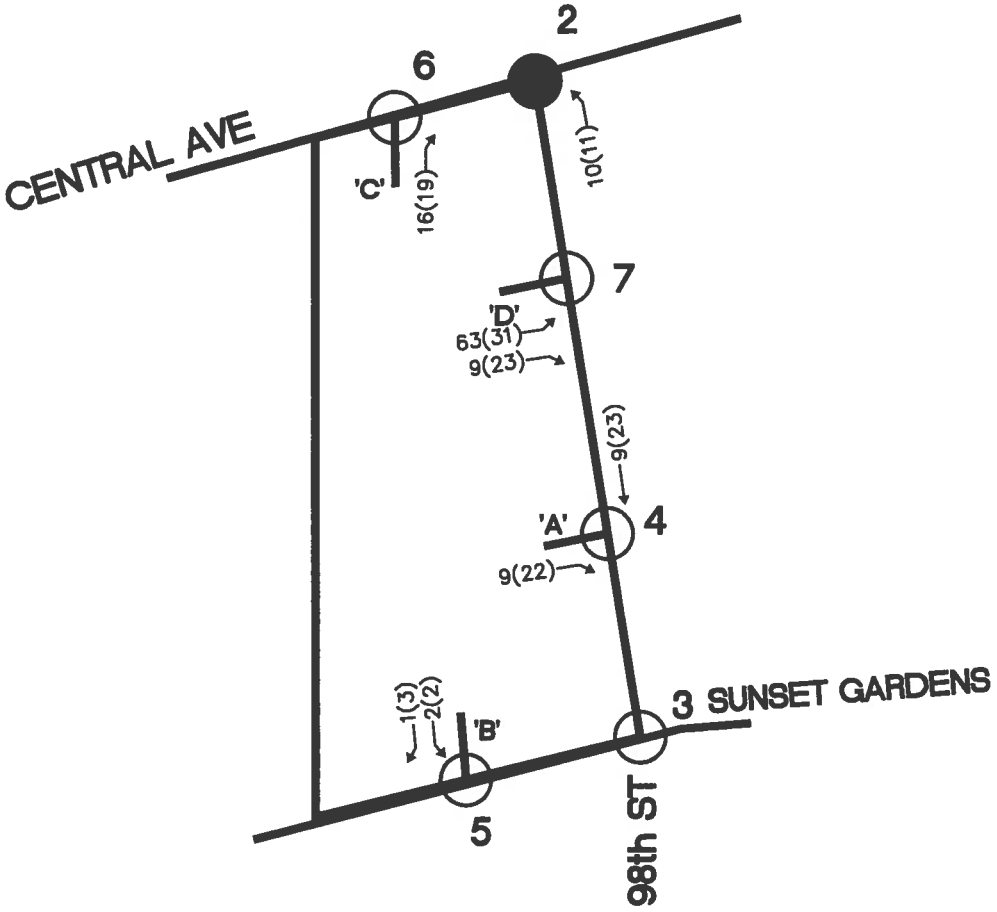
Terry O. Brown, P.E.
P.O. Box 92051
Albuquerque, NM 87199-2051
(505)883-8807 (Voice)
(505)212-0267 (Fax)

A-19a

Central / 98th St Development

(Southwest Corner)

Pass-by Trip Assignments (% Exiting)



SIGNALIZED INTERSECTION

UNSIGNALIZED INTERSECTION

Terry O. Brown, P.E.
P.O. Box 92051
Albuquerque, NM 87199-2051
(505)883-8807 (Voice)
(505)212-0267 (Fax)

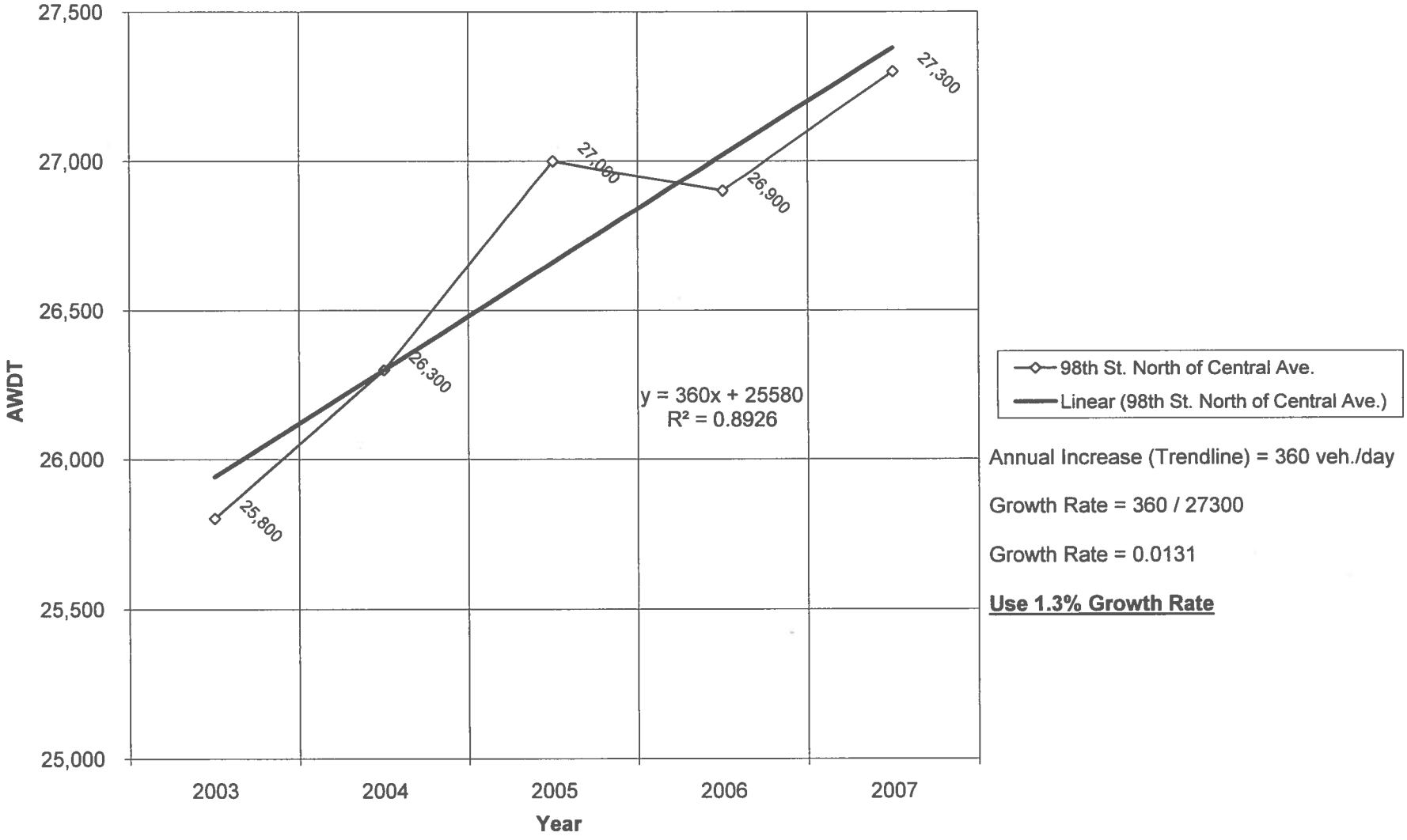
Central / 98th St Comm. Dev. (SW Corner)

Historic Growth Rate Table

Traffic Flows from MRCOG Map

	2003	2004	2005	2006	2007
98th St. North of Central Ave.	25,800	26,300	27,000	26,900	27,300
Central Ave. East of 98th St.	13,600	13,900	14,300	14,500	14,700
98th St. between Central and Tower	14,800	19,800	20,400	20,700	20,900
Tower Rd. East of 98th St.	5,700	6,300	6,500	6,600	6,600
98th St. South of Tower Rd.	13,600	13,900	14,300	14,500	17,900
Tower Rd. West of 98th St.	7,500	7,700	7,900	8,000	8,100
Central Ave. West of 98th St.	6,100	6,200	6,400	6,400	6,500

Historic Growth Chart 98th St. North of Central Ave. (2003-2007)



Annual Increase (Trendline) = 360 veh./day

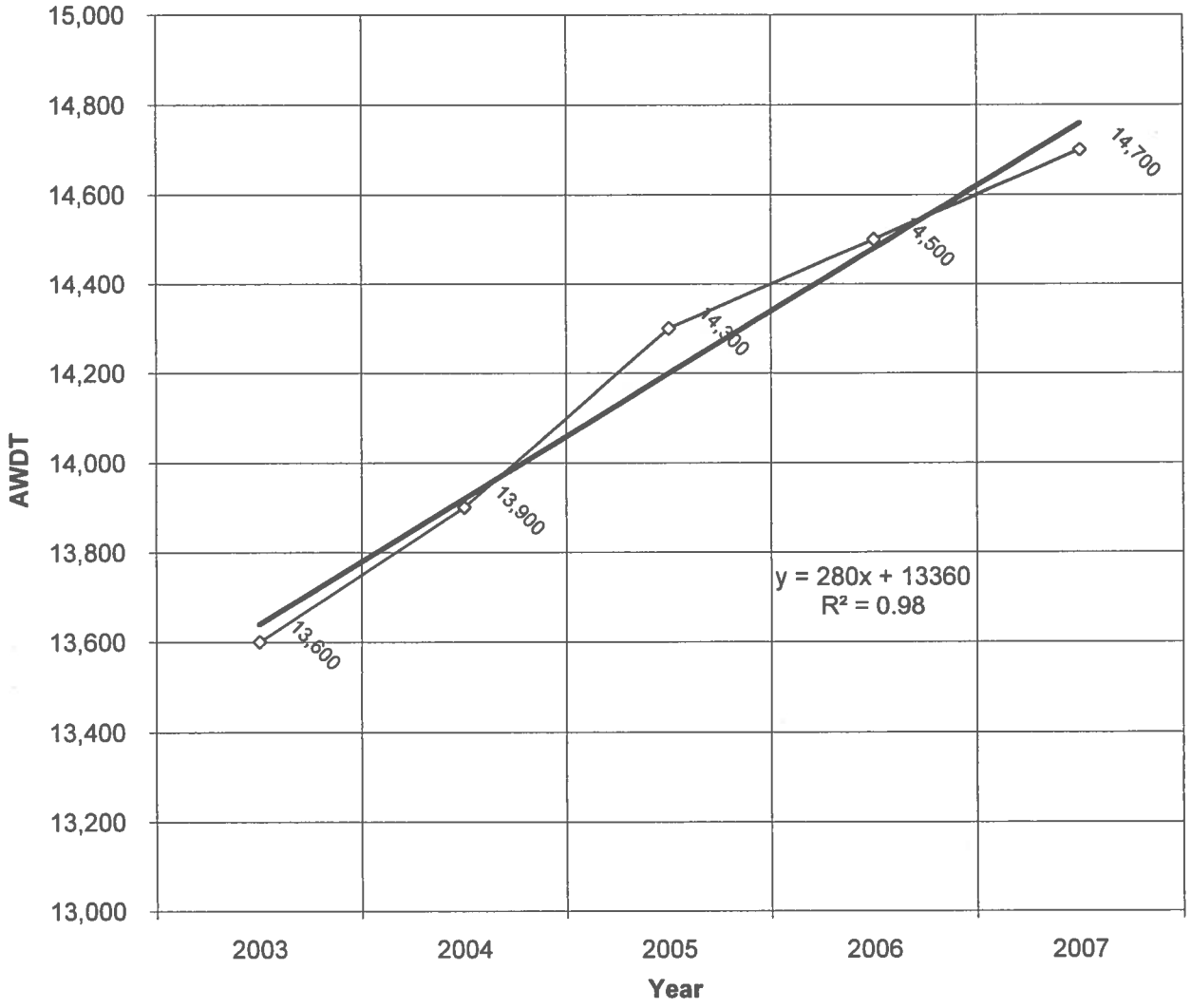
Growth Rate = 360 / 27300

Growth Rate = 0.0131

Use 1.3% Growth Rate

Central-98th-SW_Growth.xls

Historic Growth Chart Central Ave. East of 98th St. (2003-2007)



Annual Increase (Trendline) = 280 veh./day

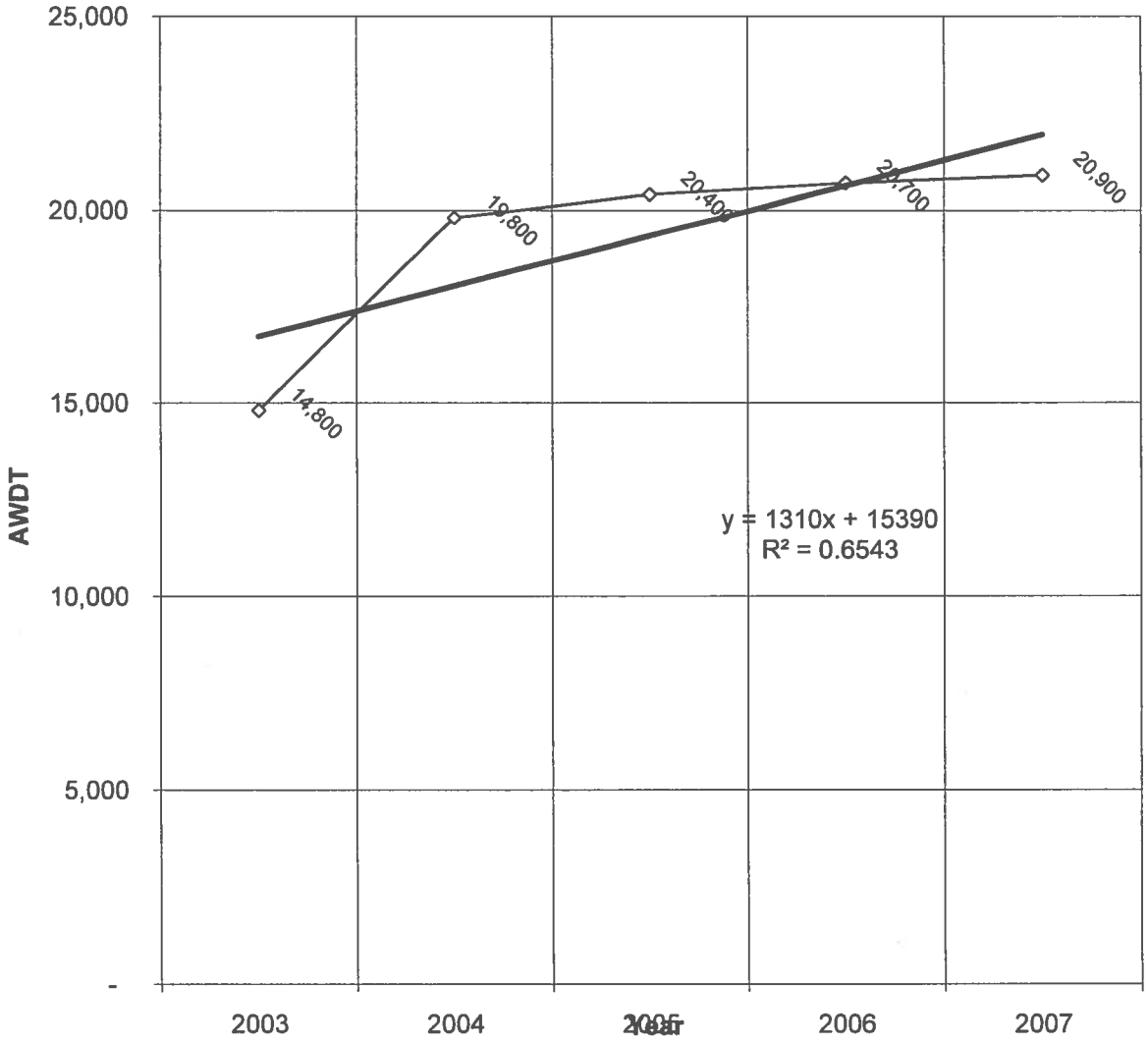
Growth Rate = 280 / 14700

Growth Rate = 0.0190

Use 1.9% Growth Rate

Central-98th-SW_Growth.xls

Historic Growth Chart 98th St. between Central and Tower (2003-2007)



Annual Increase (Trendline) = 1310 veh./day

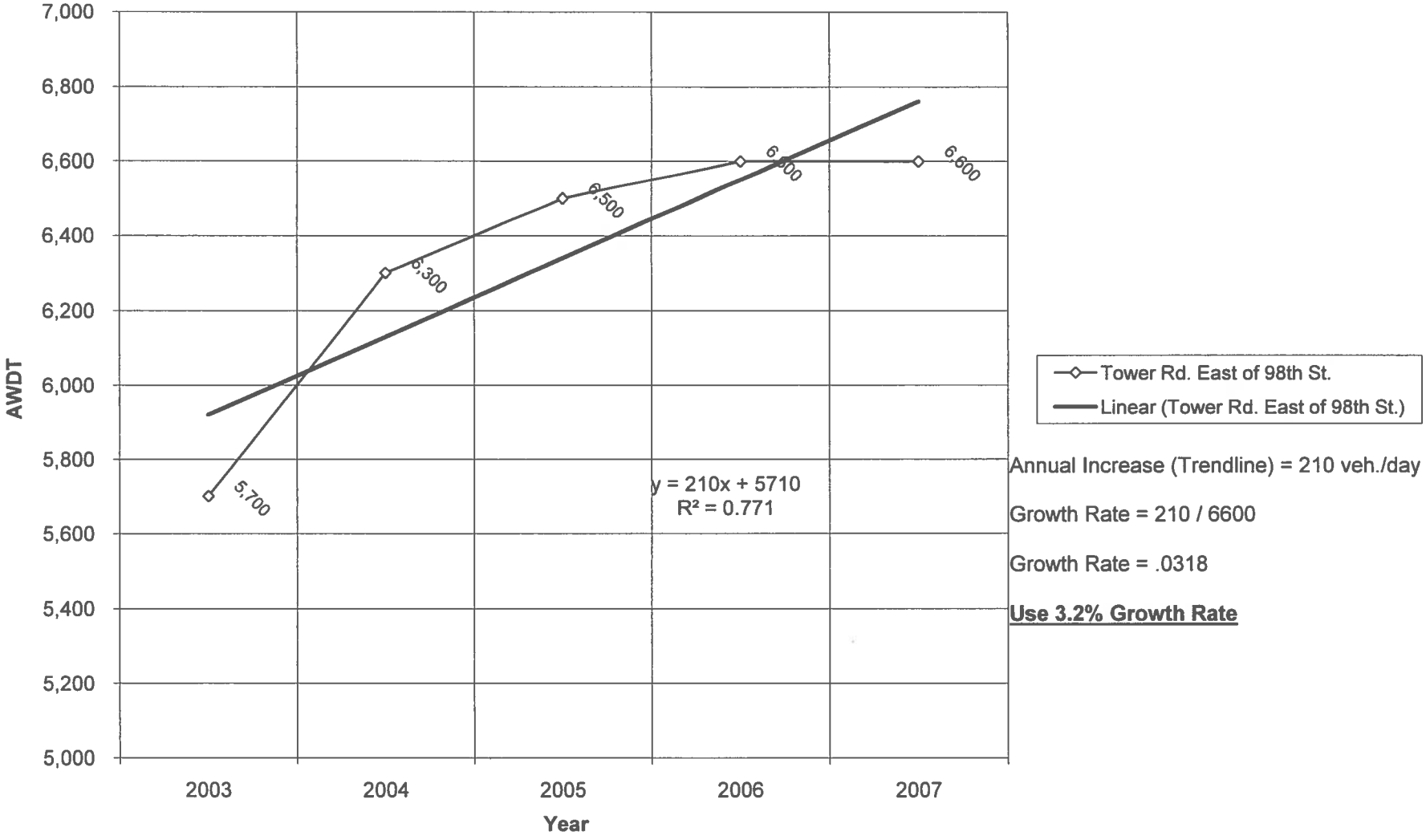
Growth Rate = 1310 / 20900

Growth Rate = 0.0626

Use 6.3% Growth Rate

Central-98th-SW_Growth.xls

Historic Growth Chart Tower Rd. East of 98th St. (2003-2007)



Annual Increase (Trendline) = 210 veh./day

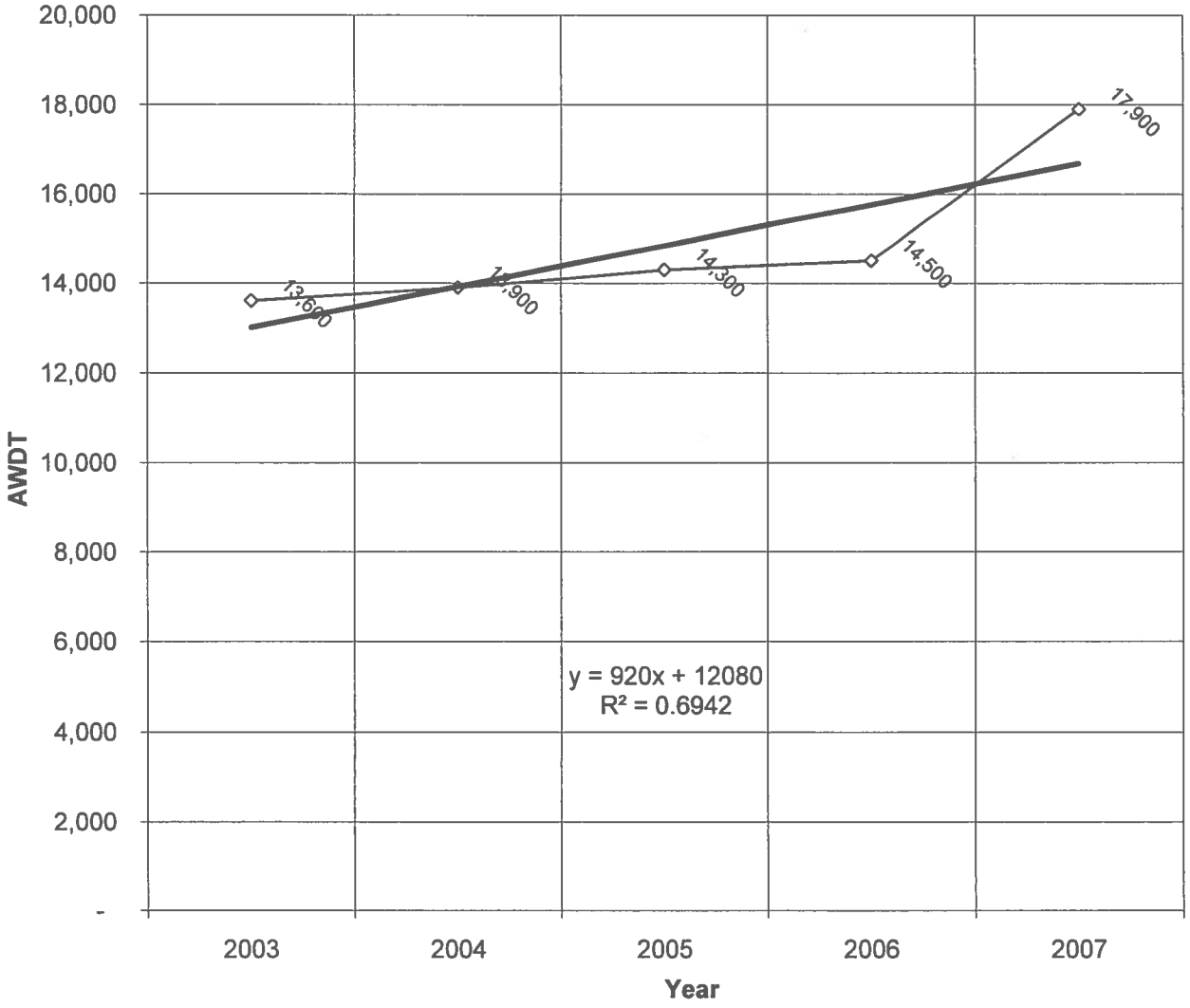
Growth Rate = 210 / 6600

Growth Rate = .0318

Use 3.2% Growth Rate

Central-98th-SW_Growth.xls

Historic Growth Chart 98th St. South of Tower Rd. (2003-2007)



Annual Increase (Trendline) = 920 veh./day

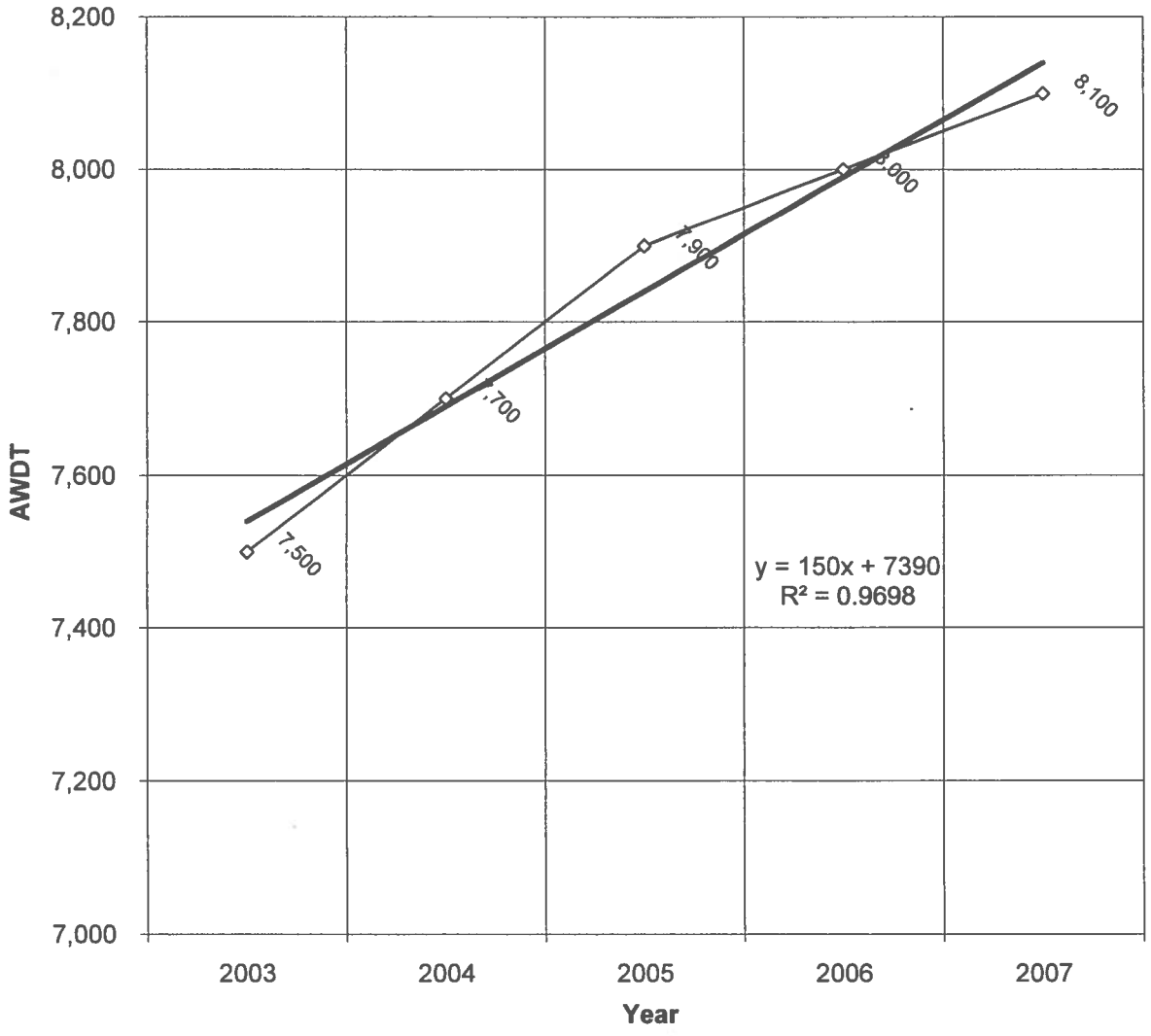
Growth Rate = 920 / 17900

Growth Rate = 0.0513

Use 5.1% Growth Rate

Central-98th-SW_Growth.xls

Historic Growth Chart Tower Rd. West of 98th St. (2003-2007)



Annual Increase (Trendline) = 150 veh./day

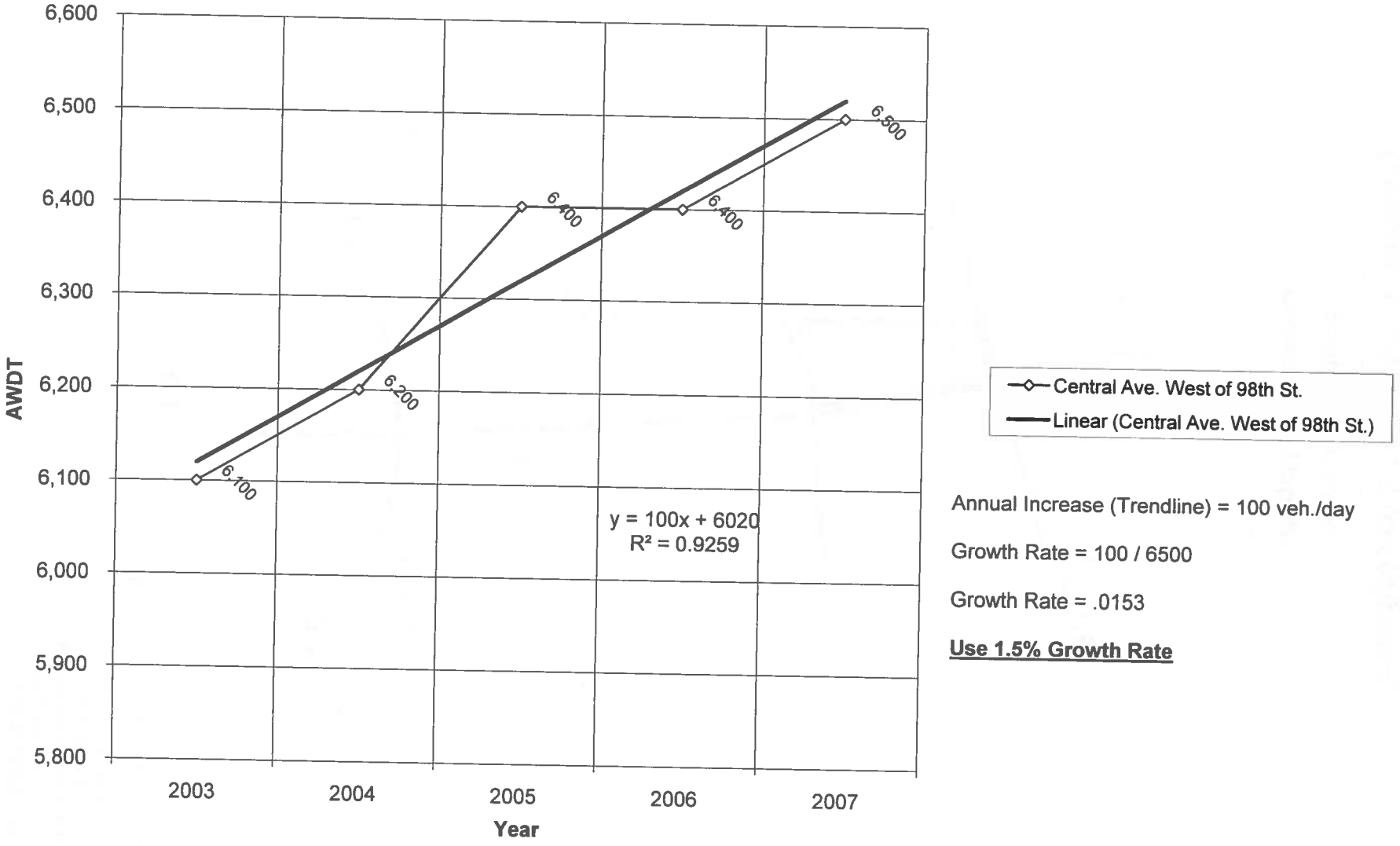
Growth Rate = 150 / 8100

Growth Rate = .0185

Use 1.9% Growth Rate

Central-98th-SW_Growth.xls

Historic Growth Chart Central Ave. West of 98th St. (2003-2007)



Annual Increase (Trendline) = 100 veh./day

Growth Rate = 100 / 6500

Growth Rate = .0153

Use 1.5% Growth Rate

Central-98th-SW_Growth.xls

Central / 98th St Commercial Development (SW corner)

Projected Turning Movements SUMMARY

PROPOSED DEVELOPMENT (2012) - 100% Development

INTERSECTION: **Summary**

Sunset Gardens Rd / Driveway "B" (5)

	0.76			0.76			0.85			0.85		PHF
3.0% Truck	Eastbound (Sunset Gardens Rd)			Westbound (Sunset Gardens Rd)			Northbound (Driveway "B")			Southbound (Driveway "B")		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing (2009)	0	62	0	0	19	0	0	0	0	0	0	0
2012 (NO BUILD - A.M.)	*0*	*73*	*0*	*0*	*23*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2012 (BUILD - A.M.)	***18***	***70***	***0***	***0***	***21***	***6***	***0***	***0***	***0***	***3***	***0***	***14***

	0.84			0.84			0.85			0.85		PHF
	Eastbound (Sunset Gardens Rd)			Westbound (Sunset Gardens Rd)			Northbound (Driveway "B")			Southbound (Driveway "B")		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing (2009)	0	61	0	0	106	0	0	0	0	0	0	0
2012 (NO BUILD - P.M.)	*0*	*71*	*0*	*0*	*125*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2012 (BUILD - P.M.)	***19***	***68***	***0***	***0***	***120***	***9***	***0***	***0***	***0***	***3***	***0***	***21***

Central Ave. / Driveway "C" (6)

	0.79			0.79			0.85			0.85		PHF
3.0% Truck	Eastbound (Central Ave.)			Westbound (Central Ave.)			Northbound (Driveway "C")			Southbound (Driveway "C")		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing (2009)	0	469	0	0	297	0	0	0	0	0	0	0
2012 (NO BUILD - A.M.)	*0*	*583*	*0*	*0*	*397*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2012 (BUILD - A.M.)	***0***	***566***	***41***	***0***	***397***	***0***	***0***	***0***	***46***	***0***	***0***	***0***

	0.82			0.82			0.85			0.85		PHF
	Eastbound (Central Ave.)			Westbound (Central Ave.)			Northbound (Driveway "C")			Southbound (Driveway "C")		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing (2009)	0	438	0	0	434	0	0	0	0	0	0	0
2012 (NO BUILD - P.M.)	*0*	*552*	*0*	*0*	*567*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
2012 (BUILD - P.M.)	***0***	***528***	***50***	***0***	***567***	***0***	***0***	***0***	***63***	***0***	***0***	***0***

Driveway "D" / 98th St (7)

	0.85			0.85			0.83			0.83		PHF
3.0% Truck	Eastbound (Driveway "D")			Westbound (Driveway "D")			Northbound (98th St)			Southbound (98th St)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing (2009)	0	0	0	0	0	0	0	1,568	0	0	564	0
2012 (NO BUILD - A.M.)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2,236*	*0*	*0*	*932*	*0*
2012 (BUILD - A.M.)	***174***	***0***	***114***	***0***	***0***	***0***	***309***	***2,152***	***0***	***0***	***977***	***79***

	0.85			0.85			0.94			0.94		PHF
	Eastbound (Driveway "D")			Westbound (Driveway "D")			Northbound (98th St)			Southbound (98th St)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing (2009)	0	0	0	0	0	0	0	764	0	0	1,759	0
2012 (NO BUILD - P.M.)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1,272*	*0*	*0*	*2,492*	*0*
2012 (BUILD - P.M.)	***161***	***0***	***166***	***0***	***0***	***0***	***278***	***1,238***	***0***	***0***	***2,506***	***124***

Central / 98th St Commercial Development (SW corner)

Projected Turning Movements Worksheet

Tower Rd / 98th St

INTERSECTION: E-W Street: **Tower Rd** (1)

N-S Street: **98th St**

Year of Existing Counts 2008

Implementation Year **2012**

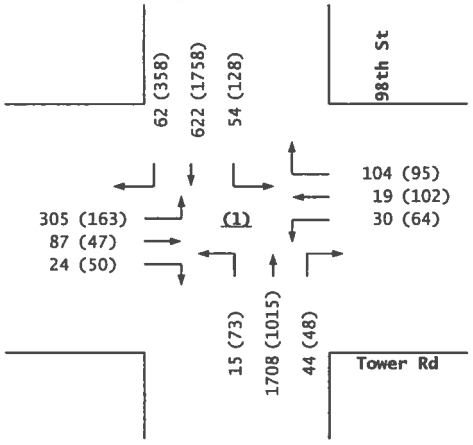
Growth Rates	1.90%			3.20%			5.10%			6.30%		
	Eastbound (Tower Rd)			Westbound (Tower Rd)			Northbound (98th St)			Southbound (98th St)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	275	81	21	23	17	74	5	1,159	36	27	329	43
Background Traffic Growth	21	6	2	3	2	9	1	236	7	7	83	11
Subtotal	296	87	23	26	19	83	6	1,395	43	34	412	54
Southwest Mesa Developments	0	0	1	4	0	0	9	195	1	0	100	0
Central / 98th St NW corner	3	0	0	0	0	7	0	39	0	7	36	3
Central / 98th St NE corner	6	0	0	0	0	14	0	79	0	13	74	5
Subtotal (NO BUILD - A.M.)	***305***	***87***	***24***	***30***	***19***	***104***	***15***	***1,708***	***44***	***54***	***622***	***62***
Percent Commercial Trips Generated(Entering)	*0.49%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*13.48%*	*0.00%*	*40.56%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Percent Commercial Trips Generated(Exiting)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*13.48%*	*40.56%*	*0.49%*
Total Trips Generated	2	0	0	0	0	50	0	149	0	44	132	2
Total AM Peak Hour BUILD Volumes	**307**	**87**	**24**	**30**	**19**	**154**	**15**	**1,857**	**44**	**98**	**754**	**64**

	Eastbound (Tower Rd)			Westbound (Tower Rd)			Northbound (98th St)			Southbound (98th St)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	143	44	40	57	90	63	55	607	38	85	1,133	279
Background Traffic Growth	11	3	3	7	12	8	11	124	8	21	286	70
Subtotal	154	47	43	64	102	71	66	731	46	106	1,419	349
Southwest Mesa Developments	0	0	7	0	0	0	7	152	2	0	214	0
Central / 98th St NW corner	4	0	0	0	0	10	0	55	0	10	56	4
Central / 98th St NE corner	5	0	0	0	0	14	0	77	0	12	69	5
Subtotal (NO BUILD - P.M.)	***163***	***47***	***50***	***64***	***102***	***95***	***73***	***1,015***	***48***	***128***	***1,758***	***358***
Percent Commercial Trips Generated(Entering)	*0.49%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*13.48%*	*0.00%*	*40.56%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Percent Commercial Trips Generated(Exiting)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*13.48%*	*40.56%*	*0.49%*
Total Trips Generated	2	0	0	0	0	54	0	162	0	55	165	2
Total PM Peak Hour BUILD Volumes	**165**	**47**	**50**	**64**	**102**	**149**	**73**	**1,177**	**48**	**183**	**1,923**	**360**

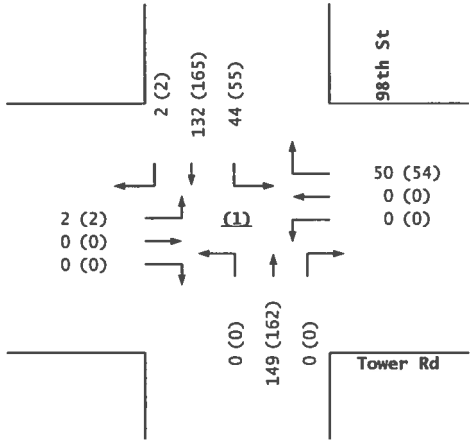
	Entering	Exiting		
Number of Commercial Trips Generated	368	325	A.M.	100% Commercial Development
	400	406	P.M.	

	Eastbound (Tower Rd)			Westbound (Tower Rd)			Northbound (98th St)			Southbound (98th St)		
2009 AM Peak Hr. Volumes	280	83	21	24	18	76	5	1,218	38	29	350	46
2009 PM Peak Hr. Volumes	146	45	41	59	93	65	58	638	40	90	1,204	297

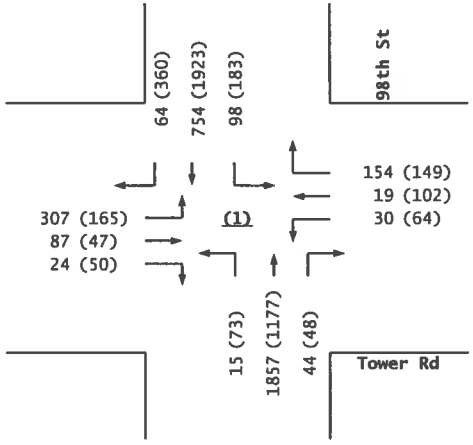
2012
NO BUILD



Trips



2012
BUILD



Tower Rd / 98th St

Central / 98th St Commercial Development (SW corner)

Projected Turning Movements Worksheet

Central Ave / 98th St

INTERSECTION: E-W Street: **Central Ave** (2)

N-S Street: **98th St**

Year of Existing Counts 2007

Implementation Year **2012**

Growth Rates	1.50%			1.90%			6.30%			1.30%		
	Eastbound (Central Ave)			Westbound (Central Ave)			Northbound (98th St)			Southbound (98th St)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	231	206	18	114	141	47	25	1,121	329	34	399	122
Background Traffic Growth	17	15	1	11	13	4	8	353	104	2	26	8
Subtotal	248	221	19	125	154	51	33	1,474	433	36	425	130
Southwest Mesa Developments	24	0	1	12	3	0	12	151	30	0	71	8
Central / 98th St NW corner	23	0	0	0	0	35	0	65	0	32	60	21
Central / 98th St NE corner	46	0	0	0	17	49	0	131	0	65	123	26
Subtotal (NO BUILD - A.M.)	***341***	***221***	***20***	***137***	***174***	***135***	***45***	***1,821***	***463***	***133***	***679***	***185***
Percent Commercial Trips Generated(Entering)	*0.00%*	*0.00%*	*2.15%*	*14.98%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*12.50%*	*0.00%*
Percent Commercial Trips Generated(Exiting)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*6.45%*	*12.50%*	*7.49%*	*0.00%*	*0.00%*	*0.00%*
Total Trips Generated	0	0	8	55	0	0	21	41	24	0	46	0
Subtotal AM Pk Hr. BUILD Volumes	**341**	**221**	**28**	**192**	**174**	**135**	**66**	**1,862**	**487**	**133**	**725**	**185**
Pass-by Trip Adjustments	*0*	*0*	*0*	*16*	*-16*	*0*	*14*	*0*	*0*	*0*	*0*	*0*
Total AM Peak Hour BUILD Volumes	**341**	**221**	**28**	**208**	**158**	**135**	**80**	**1,862**	**487**	**133**	**725**	**185**

	Eastbound (Central Ave)			Westbound (Central Ave)			Northbound (98th St)			Southbound (98th St)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	182	192	51	397	240	40	25	509	185	69	1,207	156
Background Traffic Growth	14	14	4	38	23	4	8	160	58	4	78	10
Subtotal	196	206	55	435	263	44	33	669	243	73	1,285	166
Southwest Mesa Developments	15	0	3	33	10	0	7	144	1	0	176	24
Central / 98th St NW corner	32	0	0	0	0	49	0	92	0	50	94	33
Central / 98th St NE corner	45	0	0	0	16	48	0	128	0	60	114	24
Subtotal (NO BUILD - P.M.)	***288***	***206***	***58***	***468***	***289***	***141***	***40***	***1,033***	***244***	***183***	***1,669***	***247***
Percent Commercial Trips Generated(Entering)	*0.00%*	*0.00%*	*2.15%*	*14.98%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*12.50%*	*0.00%*
Percent Commercial Trips Generated(Exiting)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*6.45%*	*12.50%*	*7.49%*	*0.00%*	*0.00%*	*0.00%*
Total Trips Generated	0	0	9	60	0	0	26	51	30	0	50	0
Subtotal PM Pk Hr. BUILD Volumes	**288**	**206**	**67**	**528**	**289**	**141**	**66**	**1,084**	**274**	**183**	**1,719**	**247**
Pass-by Trip Adjustments	*0*	*0*	*0*	*19*	*-19*	*0*	*19*	*0*	*0*	*0*	*0*	*0*
Total PM Peak Hour BUILD Volumes	**288**	**206**	**67**	**547**	**270**	**141**	**85**	**1,084**	**274**	**183**	**1,719**	**247**

	Entering	Exiting		
Number of Commercial Trips Generated	**368**	**325**	A.M.	100% Commercial Development
	400	**406**	P.M.	

	Eastbound (Central Ave)			Westbound (Central Ave)			Northbound (98th St)			Southbound (98th St)		
2009 AM Peak Hr. Volumes	238	212	19	118	146	49	28	1,262	370	35	409	125
2009 PM Peak Hr. Volumes	187	198	53	412	249	42	28	573	208	71	1,238	160

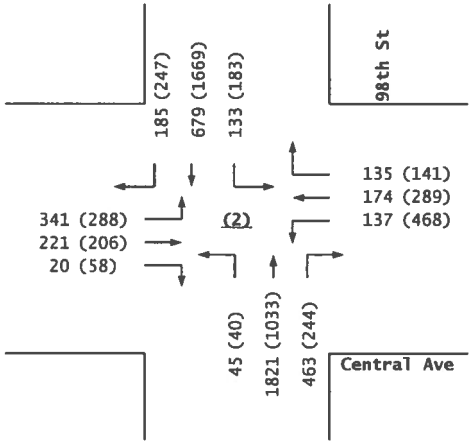
Pass-by Trip Calculations:

AM Pass-by Trips	***Eastbound (Central Ave)***			***Westbound (Central Ave)***			***Northbound (98th St)***			***Southbound (98th St)***		
Percent Entering	*0.00%*	*0.00%*	*0.00%*	*10.00%*	*-10.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Volume Entering	*0*	*0*	*0*	*16*	*-16*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Percent Exiting	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*10.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Volume Exiting	*0*	*0*	*0*	*0*	*0*	*0*	*14*	*0*	*0*	*0*	*0*	*0*
Net AM Passby Trips	***0***	***0***	***0***	***16***	***-16***	***0***	***14***	***0***	***0***	***0***	***0***	***0***

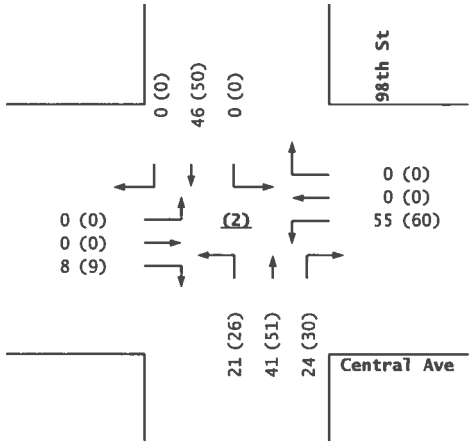
PM Pass-by Trips	***Eastbound (Central Ave)***			***Westbound (Central Ave)***			***Northbound (98th St)***			***Southbound (98th St)***		
Percent Entering	*0.00%*	*0.00%*	*0.00%*	*11.00%*	*-11.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Volume Entering	*0*	*0*	*0*	*19*	*-19*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Percent Exiting	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*11.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Volume Exiting	*0*	*0*	*0*	*0*	*0*	*0*	*19*	*0*	*0*	*0*	*0*	*0*
Net PM Passby Trips	***0***	***0***	***0***	***19***	***-19***	***0***	***19***	***0***	***0***	***0***	***0***	***0***

	Entering	*Exiting*	
Pass-by Trips	***158***	***139***	*AM*
	172	***174***	*PM*

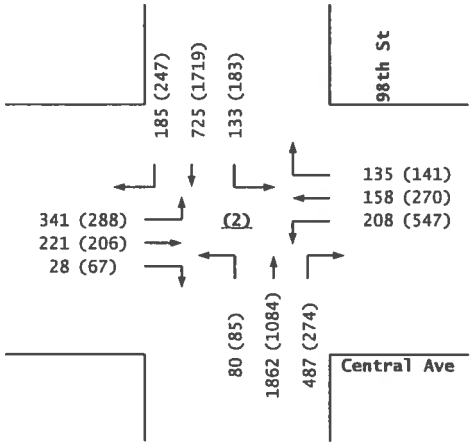
2012
NO BUILD



Trips



2012
BUILD



Central Ave / 98th St

Central / 98th St Commercial Development (SW corner)

Projected Turning Movements Worksheet

Sunset Gardens Rd / 98th St

INTERSECTION: E-W Street: **Sunset Gardens Rd** (3)

N-S Street: **98th St**

Year of Existing Counts 2008

Implementation Year **2012**

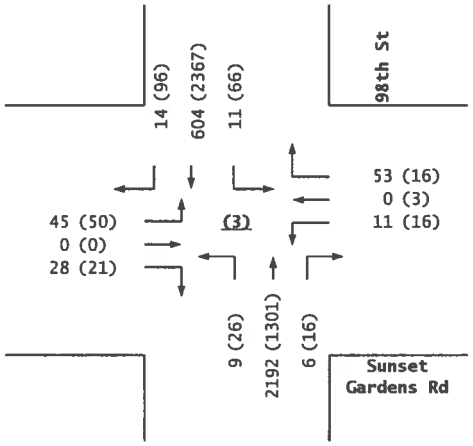
Growth Rates	**6.30%**			**6.30%**			**6.30%**			**6.30%**		
	Eastbound (Sunset Gardens Rd)			**Westbound (Sunset Gardens Rd)**			**Northbound (98th St)**			**Southbound (98th St)**		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	36	0	22	9	0	42	7	1,440	5	9	269	11
Background Traffic Growth	9	0	6	2	0	11	2	363	1	2	68	3
Subtotal	45	0	28	11	0	53	9	1,803	6	11	337	14
Southwest Mesa Developments	0	0	0	0	0	0	0	193	0	0	84	0
Central / 98th St NW corner	0	0	0	0	0	0	0	65	0	0	60	0
Central / 98th St NE corner	0	0	0	0	0	0	0	131	0	0	123	0
Subtotal (NO BUILD - A.M.)	***45***	***0***	***28***	***11***	***0***	***53***	***9***	***2,192***	***6***	***11***	***604***	***14***
Percent Commercial Trips Generated(Entering)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1.00%*	*5.33%*	*0.00%*	*55.70%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Percent Commercial Trips Generated(Exiting)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*6.33%*	*55.70%*	*0.00%*
Total Trips Generated	0	0	0	0	4	20	0	205	0	21	181	0
Total AM Peak Hour BUILD Volumes	**45**	**0**	**28**	**11**	**4**	**73**	**9**	**2,397**	**6**	**32**	**785**	**14**

	Eastbound (Sunset Gardens Rd)			**Westbound (Sunset Gardens Rd)**			**Northbound (98th St)**			**Southbound (98th St)**		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	40	0	17	13	2	13	21	742	13	53	1,555	77
Background Traffic Growth	10	0	4	3	1	3	5	187	3	13	392	19
Subtotal	50	0	21	16	3	16	26	929	16	66	1,947	96
Southwest Mesa Developments	0	0	0	0	0	0	0	152	0	0	212	0
Central / 98th St NW corner	0	0	0	0	0	0	0	92	0	0	94	0
Central / 98th St NE corner	0	0	0	0	0	0	0	128	0	0	114	0
Subtotal (NO BUILD - P.M.)	***50***	***0***	***21***	***16***	***3***	***16***	***26***	***1,301***	***16***	***66***	***2,367***	***96***
Percent Commercial Trips Generated(Entering)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1.00%*	*5.33%*	*0.00%*	*55.70%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Percent Commercial Trips Generated(Exiting)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*6.33%*	*55.70%*	*0.00%*
Total Trips Generated	0	0	0	0	4	21	0	223	0	26	226	0
Total PM Peak Hour BUILD Volumes	**50**	**0**	**21**	**16**	**7**	**37**	**26**	**1,524**	**16**	**92**	**2,593**	**96**

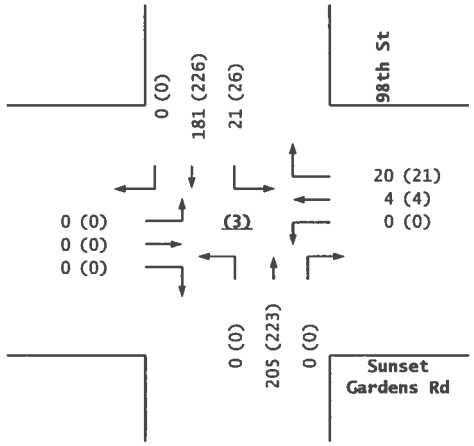
	Entering	Exiting		
Number of Commercial Trips Generated	**368**	**325**	A.M.	100% Commercial Development
	400	**406**	P.M.	

	Eastbound (Sunset Gardens Rd)			**Westbound (Sunset Gardens Rd)**			**Northbound (98th St)**			**Southbound (98th St)**		
2009 AM Peak Hr. Volumes	38	0	23	10	0	45	7	1,531	5	10	286	12
2009 PM Peak Hr. Volumes	43	0	18	14	2	14	22	789	14	56	1,653	82

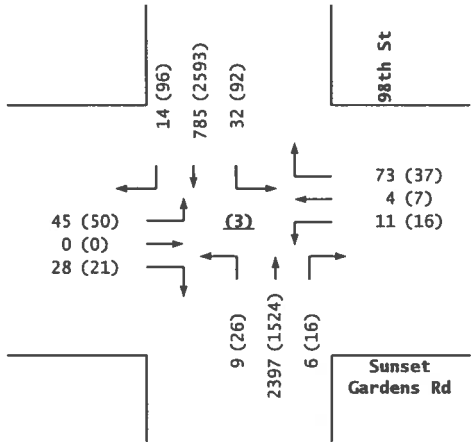
2012
NO BUILD



Trips



2012
BUILD



Sunset Gardens Rd / 98th St

Central / 98th St Commercial Development (SW corner)

Projected Turning Movements Worksheet

Driveway "A" / 98th St

INTERSECTION: E-W Street: **Driveway "A"** (4)

N-S Street: **98th St**

Year of Existing Counts **2007**

Implementation Year **2012**

Growth Rates **10.10%** **10.10%** **10.10%** **10.10%**

	Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (98th St)			Southbound (98th St)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	0	0	0	0	0	0	1,475	0	0	531	0
Background Traffic Growth	0	0	0	0	0	0	0	745	0	0	268	0
Subtotal	0	0	0	0	0	0	0	2,220	0	0	799	0
Southwest Mesa Developments	0	0	0	0	0	0	0	193	0	0	84	0
Central / 98th St NW corner	0	0	0	0	0	0	0	65	0	0	60	0
Central / 98th St NE corner	0	0	0	0	0	0	0	131	0	0	123	0
Subtotal (NO BUILD - A.M.)	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***2,609***	***0***	***0***	***1,066***	***0***
Percent Commercial Trips Generated(Entering)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*61.03%*	*0.00%*	*0.00%*	*0.00%*	*15.89%*
Percent Commercial Trips Generated(Exiting)	*0.00%*	*0.00%*	*31.02%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Total Trips Generated	0	0	101	0	0	0	0	225	0	0	0	58
Subtotal AM Pk Hr. BUILD Volumes	**0**	**0**	**101**	**0**	**0**	**0**	**0**	**2,834**	**0**	**0**	**1,066**	**58**
Pass-by Trip Adjustments	*0*	*0*	*13*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*-28*	*16*
Total AM Peak Hour BUILD Volumes	**0**	**0**	**114**	**0**	**0**	**0**	**0**	**2,834**	**0**	**0**	**1,038**	**74**

	Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (98th St)			Southbound (98th St)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	0	0	0	0	0	0	719	0	0	1,655	0
Background Traffic Growth	0	0	0	0	0	0	0	363	0	0	836	0
Subtotal	0	0	0	0	0	0	0	1,082	0	0	2,491	0
Southwest Mesa Developments	0	0	0	0	0	0	0	152	0	0	212	0
Central / 98th St NW corner	0	0	0	0	0	0	0	92	0	0	94	0
Central / 98th St NE corner	0	0	0	0	0	0	0	128	0	0	114	0
Subtotal (NO BUILD - P.M.)	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***1,454***	***0***	***0***	***2,911***	***0***
Percent Commercial Trips Generated(Entering)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*61.03%*	*0.00%*	*0.00%*	*0.00%*	*15.89%*
Percent Commercial Trips Generated(Exiting)	*0.00%*	*0.00%*	*31.02%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Total Trips Generated	0	0	126	0	0	0	0	244	0	0	0	64
Subtotal PM Pk Hr. BUILD Volumes	**0**	**0**	**126**	**0**	**0**	**0**	**0**	**1,698**	**0**	**0**	**2,911**	**64**
Pass-by Trip Adjustments	*0*	*0*	*38*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*-77*	*28*
Total PM Peak Hour BUILD Volumes	**0**	**0**	**164**	**0**	**0**	**0**	**0**	**1,698**	**0**	**0**	**2,834**	**92**

	Entering	Exiting		
Number of Commercial Trips Generated	**368**	**325**	A.M.	100% Commercial Development
	400	**406**	P.M.	

	Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (98th St)			Southbound (98th St)		
2009 AM Peak Hr. Volumes	0	0	0	0	0	0	0	1,773	0	0	638	0
2009 PM Peak Hr. Volumes	0	0	0	0	0	0	0	864	0	0	1,989	0

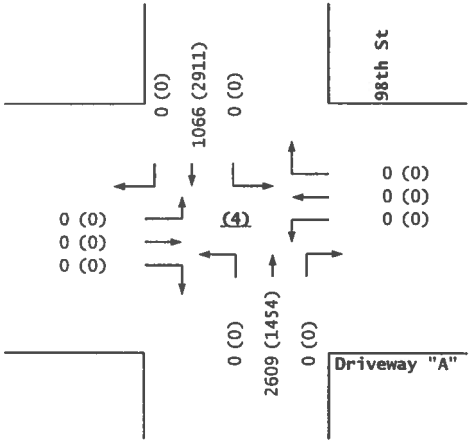
Pass-by Trip Calculations:

AM Pass-by Trips	Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (98th St)			Southbound (98th St)		
Percent Entering	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*-18.00%*	*10.00%*
Volume Entering	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*-28*	*16*
Percent Exiting	*0.00%*	*0.00%*	*9.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Volume Exiting	*0*	*0*	*13*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Net AM Passby Trips	***0***	***0***	***13***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***-28***	***16***

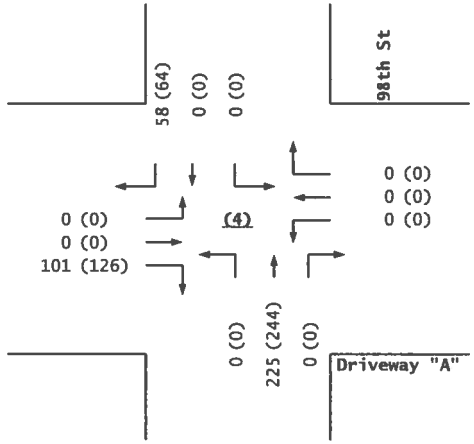
PM Pass-by Trips	Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (98th St)			Southbound (98th St)		
Percent Entering	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*-45.00%*	*16.00%*
Volume Entering	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*-77*	*28*
Percent Exiting	*0.00%*	*0.00%*	*22.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Volume Exiting	*0*	*0*	*38*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Net PM Passby Trips	***0***	***0***	***38***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***-77***	***28***

	Entering	Exiting	
Pass-by Trips	***158***	***139***	*AM*
	172	***174***	*PM*

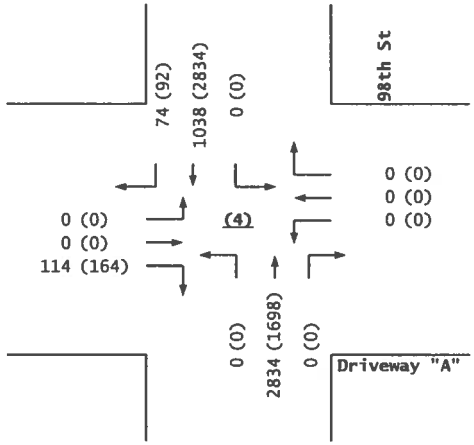
2012
NO BUILD



Trips



2012
BUILD



Driveway "A" / 98th St

Central / 98th St Commercial Development (SW corner)

Projected Turning Movements Worksheet

Sunset Gardens Rd / Driveway "B"

INTERSECTION: E-W Street: **Sunset Gardens Rd** (5)

N-S Street: **Driveway "B"**

Year of Existing Counts 2008

Implementation Year **2012**

Growth Rates 6.30% 6.30% 6.30% 6.30%

	Eastbound (Sunset Gardens Rd)			Westbound (Sunset Gardens Rd)			Northbound (Driveway "B")			Southbound (Driveway "B")		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	58	0	0	18	0	0	0	0	0	0	0
Background Traffic Growth	0	15	0	0	5	0	0	0	0	0	0	0
Subtotal	0	73	0	0	23	0	0	0	0	0	0	0
Subtotal (NO BUILD - A.M.)	***0***	***73***	***0***	***0***	***23***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Percent Commercial Trips Generated(Entering)	*4.05%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Percent Commercial Trips Generated(Exiting)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*4.05%*
Total Trips Generated	15	0	0	0	0	4	0	0	0	0	0	13
Subtotal AM Pk Hr. BUILD Volumes	**15**	**73**	**0**	**0**	**23**	**4**	**0**	**0**	**0**	**0**	**0**	**13**
Pass-by Trip Adjustments	*3*	*-3*	*0*	*0*	*-2*	*2*	*0*	*0*	*0*	*3*	*0*	*1*
Total AM Peak Hour BUILD Volumes	**18**	**70**	**0**	**0**	**21**	**6**	**0**	**0**	**0**	**3**	**0**	**14**

	Eastbound (Sunset Gardens Rd)			Westbound (Sunset Gardens Rd)			Northbound (Driveway "B")			Southbound (Driveway "B")		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	57	0	0	100	0	0	0	0	0	0	0
Background Traffic Growth	0	14	0	0	25	0	0	0	0	0	0	0
Subtotal	0	71	0	0	125	0	0	0	0	0	0	0
Subtotal (NO BUILD - P.M.)	***0***	***71***	***0***	***0***	***125***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Percent Commercial Trips Generated(Entering)	*4.05%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*1.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Percent Commercial Trips Generated(Exiting)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*4.05%*
Total Trips Generated	16	0	0	0	0	4	0	0	0	0	0	16
Subtotal PM Pk Hr. BUILD Volumes	**16**	**71**	**0**	**0**	**125**	**4**	**0**	**0**	**0**	**0**	**0**	**16**
Pass-by Trip Adjustments	*3*	*-3*	*0*	*0*	*-5*	*5*	*0*	*0*	*0*	*3*	*0*	*5*
Total PM Peak Hour BUILD Volumes	**19**	**68**	**0**	**0**	**120**	**9**	**0**	**0**	**0**	**3**	**0**	**21**

	Entering	Exiting		
Number of Commercial Trips Generated	**368**	**325**	A.M.	100% Commercial Development
	400	**406**	P.M.	

	Eastbound (Sunset Gardens Rd)			Westbound (Sunset Gardens Rd)			Northbound (Driveway "B")			Southbound (Driveway "B")		
2009 AM Peak Hr. Volumes	0	62	0	0	19	0	0	0	0	0	0	0
2009 PM Peak Hr. Volumes	0	61	0	0	106	0	0	0	0	0	0	0

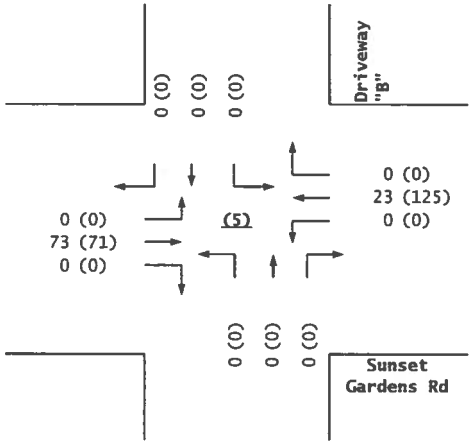
Pass-by Trip Calculations:

AM Pass-by Trips	Eastbound (Sunset Gardens Rd)			Westbound (Sunset Gardens Rd)			Northbound (Driveway "B")			Southbound (Driveway "B")		
Percent Entering	*2.00%*	*-2.00%*	*0.00%*	*0.00%*	*-1.00%*	*1.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Volume Entering	*3*	*-3*	*0*	*0*	*-2*	*2*	*0*	*0*	*0*	*0*	*0*	*0*
Percent Exiting	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*2.00%*	*0.00%*	*1.00%*
Volume Exiting	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*1*
Net AM Passby Trips	***3***	***-3***	***0***	***0***	***-2***	***2***	***0***	***0***	***0***	***3***	***0***	***1***

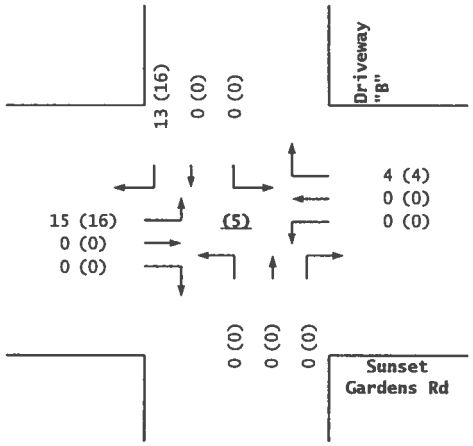
PM Pass-by Trips	Eastbound (Sunset Gardens Rd)			Westbound (Sunset Gardens Rd)			Northbound (Driveway "B")			Southbound (Driveway "B")		
Percent Entering	*2.00%*	*-2.00%*	*0.00%*	*0.00%*	*-3.00%*	*3.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Volume Entering	*3*	*-3*	*0*	*0*	*-5*	*5*	*0*	*0*	*0*	*0*	*0*	*0*
Percent Exiting	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*2.00%*	*0.00%*	*3.00%*
Volume Exiting	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*5*
Net PM Passby Trips	***3***	***-3***	***0***	***0***	***-5***	***5***	***0***	***0***	***0***	***3***	***0***	***5***

	Entering	*Exiting*	
Pass-by Trips	***158***	***139***	*AM*
	172	***174***	*PM*

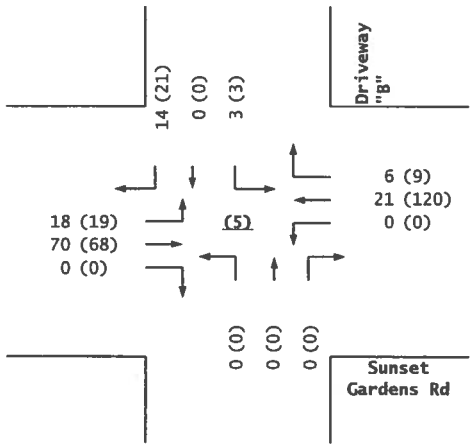
2012
NO BUILD



Trips



2012
BUILD



Sunset Gardens Rd / Driveway "B"

Central / 98th St Commercial Development (SW corner)

Projected Turning Movements Worksheet

Central Ave. / Driveway "C"

INTERSECTION: E-W Street: **Central Ave.** (6)

N-S Street: **Driveway "C"**

Year of Existing Counts **2007**

Implementation Year **2012**

Growth Rates 1.50% 1.50% 1.50% 1.50%

	Eastbound (Central Ave.)			Westbound (Central Ave.)			Northbound (Driveway "C")			Southbound (Driveway "C")		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	455	0	0	288	0	0	0	0	0	0	0
Background Traffic Growth	0	34	0	0	22	0	0	0	0	0	0	0
Subtotal	0	489	0	0	310	0	0	0	0	0	0	0
Southwest Mesa Developments	0	25	0	0	23	0	0	0	0	0	0	0
Central / 98th St NW corner	0	23	0	0	21	0	0	0	0	0	0	0
Central / 98th St NE corner	0	46	0	0	43	0	0	0	0	0	0	0
Subtotal (NO BUILD - A.M.)	***0***	***583***	***0***	***0***	***397***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Percent Commercial Trips Generated(Entering)	*0.00%*	*2.15%*	*4.30%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Percent Commercial Trips Generated(Exiting)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*7.49%*	*0.00%*	*0.00%*	*0.00%*
Total Trips Generated	0	8	16	0	0	0	0	0	24	0	0	0
Subtotal AM Pk Hr. BUILD Volumes	**0**	**591**	**16**	**0**	**397**	**0**	**0**	**0**	**24**	**0**	**0**	**0**
Pass-by Trip Adjustments	*0*	*-25*	*25*	*0*	*0*	*0*	*0*	*0*	*22*	*0*	*0*	*0*
Total AM Peak Hour BUILD Volumes	**0**	**566**	**41**	**0**	**397**	**0**	**0**	**0**	**46**	**0**	**0**	**0**

	Eastbound (Central Ave.)			Westbound (Central Ave.)			Northbound (Driveway "C")			Southbound (Driveway "C")		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	425	0	0	421	0	0	0	0	0	0	0
Background Traffic Growth	0	32	0	0	32	0	0	0	0	0	0	0
Subtotal	0	457	0	0	453	0	0	0	0	0	0	0
Southwest Mesa Developments	0	18	0	0	41	0	0	0	0	0	0	0
Central / 98th St NW corner	0	32	0	0	33	0	0	0	0	0	0	0
Central / 98th St NE corner	0	45	0	0	40	0	0	0	0	0	0	0
Subtotal (NO BUILD - P.M.)	***0***	***552***	***0***	***0***	***567***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Percent Commercial Trips Generated(Entering)	*0.00%*	*2.15%*	*4.30%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Percent Commercial Trips Generated(Exiting)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*7.49%*	*0.00%*	*0.00%*	*0.00%*
Total Trips Generated	0	9	17	0	0	0	0	0	30	0	0	0
Subtotal PM Pk Hr. BUILD Volumes	**0**	**561**	**17**	**0**	**567**	**0**	**0**	**0**	**30**	**0**	**0**	**0**
Pass-by Trip Adjustments	*0*	*-33*	*33*	*0*	*0*	*0*	*0*	*0*	*33*	*0*	*0*	*0*
Total PM Peak Hour BUILD Volumes	**0**	**528**	**50**	**0**	**567**	**0**	**0**	**0**	**63**	**0**	**0**	**0**

	Entering	Exiting		
Number of Commercial Trips Generated	**368**	**325**	A.M.	100% Commercial Development
	400	**406**	P.M.	

	Eastbound (Central Ave.)			Westbound (Central Ave.)			Northbound (Driveway "C")			Southbound (Driveway "C")		
2009 AM Peak Hr. Volumes	0	469	0	0	297	0	0	0	0	0	0	0
2009 PM Peak Hr. Volumes	0	438	0	0	434	0	0	0	0	0	0	0

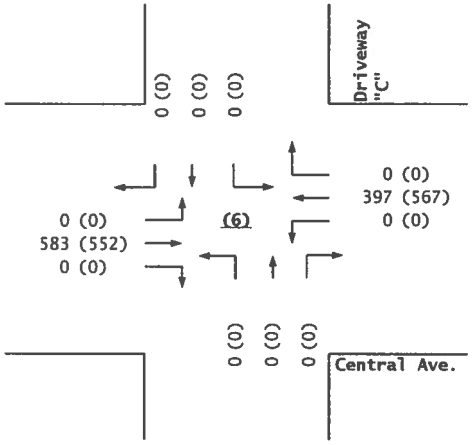
Pass-by Trip Calculations:

AM Pass-by Trips	Eastbound (Central Ave.)			Westbound (Central Ave.)			Northbound (Driveway "C")			Southbound (Driveway "C")		
Percent Entering	*0.00%*	*-16.00%*	*16.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Volume Entering	*0*	*-25*	*25*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Percent Exiting	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*16.00%*	*0.00%*	*0.00%*	*0.00%*
Volume Exiting	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*22*	*0*	*0*	*0*
Net AM Passby Trips	***0***	***-25***	***25***	***0***	***0***	***0***	***0***	***0***	***22***	***0***	***0***	***0***

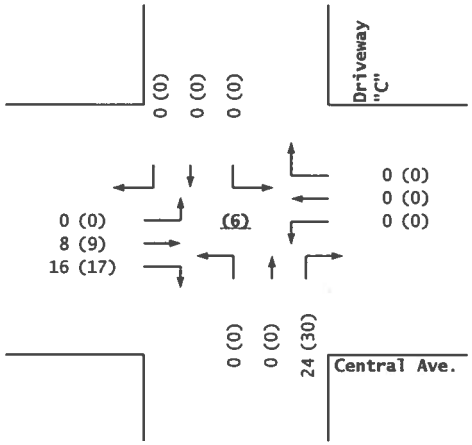
PM Pass-by Trips	Eastbound (Central Ave.)			Westbound (Central Ave.)			Northbound (Driveway "C")			Southbound (Driveway "C")		
Percent Entering	*0.00%*	*-19.00%*	*19.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Volume Entering	*0*	*-33*	*33*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Percent Exiting	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*19.00%*	*0.00%*	*0.00%*	*0.00%*
Volume Exiting	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*33*	*0*	*0*	*0*
Net PM Passby Trips	***0***	***-33***	***33***	***0***	***0***	***0***	***0***	***0***	***33***	***0***	***0***	***0***

	Entering	*Exiting*	
Pass-by Trips	***158***	***139***	*AM*
	172	***174***	*PM*

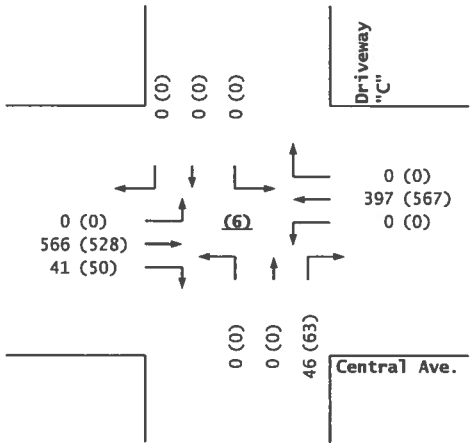
2012
NO BUILD



Trips



2012
BUILD



Central Ave. / Driveway "C"

Central / 98th St Commercial Development (SW corner)

Projected Turning Movements Worksheet

Driveway "D" / 98th St

INTERSECTION: E-W Street: **Driveway "D"** (7)

N-S Street: **98th St**

Year of Existing Counts 2008

Implementation Year **2012**

Growth Rates 6.30% 6.30% 6.30% 6.30%

	Eastbound (Driveway "D")			Westbound (Driveway "D")			Northbound (98th St)			Southbound (98th St)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	0	0	0	0	0	0	1,475	0	0	531	0
Background Traffic Growth	0	0	0	0	0	0	0	372	0	0	134	0
Subtotal	0	0	0	0	0	0	0	1,847	0	0	665	0
Southwest Mesa Developments	0	0	0	0	0	0	0	193	0	0	84	0
Central / 98th St NW corner	0	0	0	0	0	0	0	65	0	0	60	0
Central / 98th St NE corner	0	0	0	0	0	0	0	131	0	0	123	0
Subtotal (NO BUILD - A.M.)	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***2,236***	***0***	***0***	***932***	***0***
Percent Commercial Trips Generated(Entering)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*61.03%*	*0.00%*	*0.00%*	*0.00%*	*15.89%*	*13.74%*
Percent Commercial Trips Generated(Exiting)	*26.44%*	*0.00%*	*31.01%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Total Trips Generated	86	0	101	0	0	0	225	0	0	0	58	51
Subtotal AM Pk Hr. BUILD Volumes	**86**	**0**	**101**	**0**	**0**	**0**	**225**	**2,236**	**0**	**0**	**990**	**51**
Pass-by Trip Adjustments	*88*	*0*	*13*	*0*	*0*	*0*	*84*	*-84*	*0*	*0*	*-13*	*28*
Total AM Peak Hour BUILD Volumes	**174**	**0**	**114**	**0**	**0**	**0**	**309**	**2,152**	**0**	**0**	**977**	**79**

	Eastbound (Driveway "D")			Westbound (Driveway "D")			Northbound (98th St)			Southbound (98th St)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	0	0	0	0	0	0	719	0	0	1,655	0
Background Traffic Growth	0	0	0	0	0	0	0	181	0	0	417	0
Subtotal	0	0	0	0	0	0	0	900	0	0	2,072	0
Southwest Mesa Developments	0	0	0	0	0	0	0	152	0	0	212	0
Central / 98th St NW corner	0	0	0	0	0	0	0	92	0	0	94	0
Central / 98th St NE corner	0	0	0	0	0	0	0	128	0	0	114	0
Subtotal (NO BUILD - P.M.)	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***1,272***	***0***	***0***	***2,492***	***0***
Percent Commercial Trips Generated(Entering)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*61.03%*	*0.00%*	*0.00%*	*0.00%*	*15.89%*	*13.74%*
Percent Commercial Trips Generated(Exiting)	*26.44%*	*0.00%*	*31.01%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Total Trips Generated	107	0	126	0	0	0	244	0	0	0	64	55
Subtotal PM Pk Hr. BUILD Volumes	**107**	**0**	**126**	**0**	**0**	**0**	**244**	**1,272**	**0**	**0**	**2,556**	**55**
Pass-by Trip Adjustments	*54*	*0*	*40*	*0*	*0*	*0*	*34*	*-34*	*0*	*0*	*-50*	*69*
Total PM Peak Hour BUILD Volumes	**161**	**0**	**166**	**0**	**0**	**0**	**278**	**1,238**	**0**	**0**	**2,506**	**124**

	Entering	Exiting		
Number of Commercial Trips Generated	**368**	**325**	A.M.	100% Commercial Development
	400	**406**	P.M.	

	Eastbound (Driveway "D")			Westbound (Driveway "D")			Northbound (98th St)			Southbound (98th St)		
2009 AM Peak Hr. Volumes	0	0	0	0	0	0	0	1,568	0	0	564	0
2009 PM Peak Hr. Volumes	0	0	0	0	0	0	0	764	0	0	1,759	0

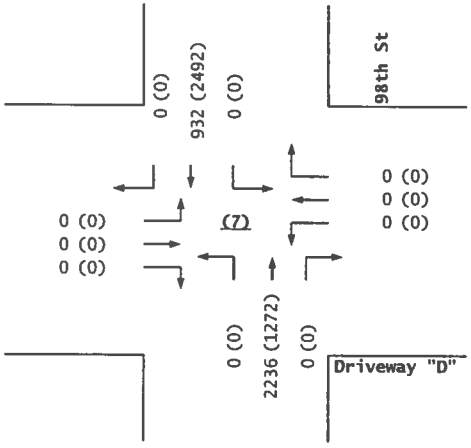
Pass-by Trip Calculations:

AM Pass-by Trips	***Eastbound (Driveway "D")***			***Westbound (Driveway "D")***			***Northbound (98th St)***			***Southbound (98th St)***		
Percent Entering	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*53.00%*	*-53.00%*	*0.00%*	*0.00%*	*-8.00%*	*18.00%*
Volume Entering	*0*	*0*	*0*	*0*	*0*	*0*	*84*	*-84*	*0*	*0*	*-13*	*28*
Percent Exiting	*63.00%*	*0.00%*	*9.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Volume Exiting	*88*	*0*	*13*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Net AM Passby Trips	***88***	***0***	***13***	***0***	***0***	***0***	***84***	***-84***	***0***	***0***	***-13***	***28***

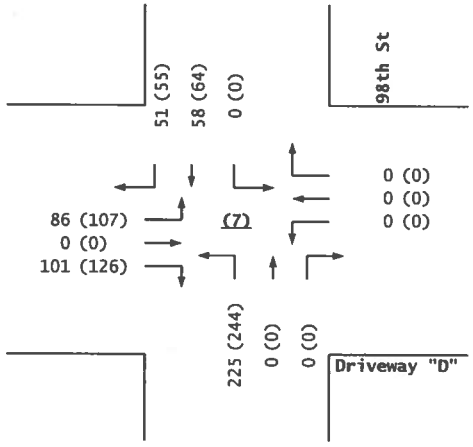
PM Pass-by Trips	***Eastbound (Driveway "D")***			***Westbound (Driveway "D")***			***Northbound (98th St)***			***Southbound (98th St)***		
Percent Entering	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*20.00%*	*-20.00%*	*0.00%*	*0.00%*	*-29.00%*	*40.00%*
Volume Entering	*0*	*0*	*0*	*0*	*0*	*0*	*34*	*-34*	*0*	*0*	*-50*	*69*
Percent Exiting	*31.00%*	*0.00%*	*23.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Volume Exiting	*54*	*0*	*40*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Net PM Passby Trips	***54***	***0***	***40***	***0***	***0***	***0***	***34***	***-34***	***0***	***0***	***-50***	***69***

	Entering	*Exiting*	
Pass-by Trips	***158***	***139***	*AM*
	172	***174***	*PM*

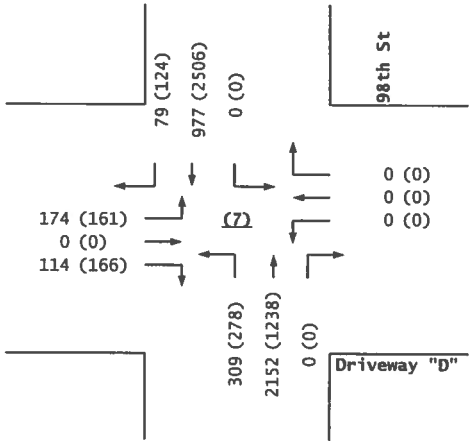
2012
NO BUILD



Trips



2012
BUILD



Driveway "D" / 98th St

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	305	87	30	19	104	15	1708	44	54	622	62
Turn Type	Perm		Perm		Free	pm+pt		Free	pm+pt		Perm
Protected Phases		4		8		5	2		1	6	
Permitted Phases	4		8		Free	2		Free	6		6
Detector Phase	4	4	8	8		5	2		1	6	6
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0		8.0	20.0		8.0	20.0	20.0
Total Split (s)	37.0	37.0	37.0	37.0	0.0	8.0	75.0	0.0	8.0	75.0	75.0
Total Split (%)	30.8%	30.8%	30.8%	30.8%	0.0%	6.7%	62.5%	0.0%	6.7%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5	0.5		0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	Min		Min	C-Min		Min	C-Min	C-Min
Act Effct Green (s)	33.0	33.0	33.0	33.0	120.0	75.0	71.0	120.0	75.0	71.0	71.0
Actuated g/C Ratio	0.28	0.28	0.28	0.28	1.00	0.62	0.59	1.00	0.62	0.59	0.59
v/c Ratio	1.07	0.15	0.11	0.02	0.08	0.05	1.00	0.03	0.56	0.37	0.08
Control Delay	107.3	26.8	33.7	31.9	0.1	7.5	45.7	0.0	37.0	11.4	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	107.3	26.8	33.7	31.9	0.1	7.5	45.7	0.0	37.0	11.4	1.7
LOS	F	C	C	C	A	A	D	A	D	B	A
Approach Delay		85.8		10.7			44.3			12.5	
Approach LOS		F		B			D			B	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 42 (35%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 41.0 — Intersection LOS: D
Intersection Capacity Utilization 77.4% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: Tower Rd & 98th St

Terry O. Brown, P.E.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	305	87	24	30	19	104	15	1708	44	54	622	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3390		1752	3505	1568	1752	3505	1568	1752	3505	1568
Flt Permitted	0.74	1.00		0.66	1.00	1.00	0.31	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1368	3390		1216	3505	1568	570	3505	1568	104	3505	1568
Peak-hour factor, PHF	0.76	0.76	0.76	0.84	0.84	0.84	0.82	0.82	0.82	0.81	0.81	0.81
Adj. Flow (vph)	401	114	32	36	23	124	18	2083	54	67	768	77
RTOR Reduction (vph)	0	21	0	0	0	0	0	0	0	0	0	31
Lane Group Flow (vph)	401	125	0	36	23	124	18	2083	54	67	768	46
Turn Type	Perm			Perm		Free	pm+pt		Free	pm+pt		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		Free	2		Free	6		6
Actuated Green, G (s)	33.0	33.0		33.0	33.0	120.0	75.0	71.0	120.0	75.0	71.0	71.0
Effective Green, g (s)	33.0	33.0		33.0	33.0	120.0	75.0	71.0	120.0	75.0	71.0	71.0
Actuated g/C Ratio	0.28	0.28		0.28	0.28	1.00	0.62	0.59	1.00	0.62	0.59	0.59
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	376	932		334	964	1568	396	2074	1568	120	2074	928
v/s Ratio Prot		0.04			0.01		0.00	c0.59		c0.02	0.22	
v/s Ratio Perm	c0.29			0.03		0.08	0.03		0.03	0.33		0.03
v/c Ratio	1.07	0.13		0.11	0.02	0.08	0.05	1.00	0.03	0.56	0.37	0.05
Uniform Delay, d1	43.5	32.7		32.5	31.7	0.0	9.0	24.5	0.0	28.2	12.8	10.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.69	0.84	0.66
Incremental Delay, d2	65.2	0.1		0.1	0.0	0.1	0.0	20.8	0.0	5.4	0.5	0.1
Delay (s)	108.7	32.8		32.6	31.8	0.1	9.0	45.3	0.0	53.1	11.3	6.9
Level of Service	F	C		C	C	A	A	D	A	D	B	A
Approach Delay (s)		88.4			10.5			43.9			14.0	
Approach LOS		F			B			D			B	

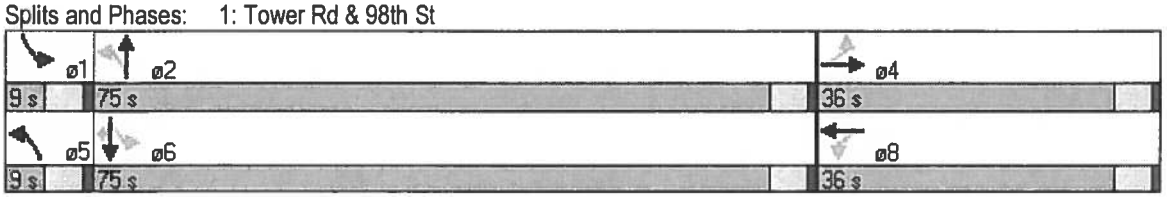
Intersection Summary			
HCM Average Control Delay	41.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	307	87	30	19	154	15	1857	44	98	754	64
Turn Type	Perm		Perm		Free	pm+pt		Free	pm+pt		Perm
Protected Phases		4		8		5	2		1	6	
Permitted Phases	4		8		Free	2		Free	6		6
Detector Phase	4	4	8	8		5	2		1	6	6
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0		9.0	21.0		9.0	21.0	21.0
Total Split (s)	36.0	36.0	36.0	36.0	0.0	9.0	75.0	0.0	9.0	75.0	75.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	0.0%	7.5%	62.5%	0.0%	7.5%	62.5%	62.5%
Yellow Time (s)	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag						Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	Min		Min	Min		Min	Min	Min
Act Effct Green (s)	31.0	31.0	31.0	31.0	120.0	74.0	70.0	120.0	74.0	70.0	70.0
Actuated g/C Ratio	0.26	0.26	0.26	0.26	1.00	0.62	0.58	1.00	0.62	0.58	0.58
v/c Ratio	1.14	0.16	0.11	0.03	0.12	0.06	1.11	0.03	1.01	0.46	0.08
Control Delay	132.8	28.0	35.4	33.4	0.1	7.6	81.9	0.0	107.9	15.1	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	132.8	28.0	35.4	33.4	0.1	7.6	81.9	0.0	107.9	15.1	2.6
LOS	F	C	D	C	A	A	F	A	F	B	A
Approach Delay		105.0		8.6			79.4			24.1	
Approach LOS		F		A			E			C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 64.0 — Intersection LOS: E
Intersection Capacity Utilization 92.9% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 1: Tower Rd & 98th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	307	87	24	30	19	154	15	1857	44	98	754	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3390		1752	3505	1568	1752	3505	1568	1752	3505	1568
Flt Permitted	0.74	1.00		0.66	1.00	1.00	0.25	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1368	3390		1216	3505	1568	455	3505	1568	105	3505	1568
Peak-hour factor, PHF	0.76	0.76	0.76	0.84	0.84	0.84	0.82	0.82	0.82	0.81	0.81	0.81
Adj. Flow (vph)	404	114	32	36	23	183	18	2265	54	121	931	79
RTOR Reduction (vph)	0	22	0	0	0	0	0	0	0	0	0	33
Lane Group Flow (vph)	404	124	0	36	23	183	18	2265	54	121	931	46
Turn Type	Perm			Perm		Free	pm+pt		Free	pm+pt		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		Free	2		Free	6		6
Actuated Green, G (s)	31.0	31.0		31.0	31.0	120.0	74.0	70.0	120.0	74.0	70.0	70.0
Effective Green, g (s)	31.0	31.0		31.0	31.0	120.0	74.0	70.0	120.0	74.0	70.0	70.0
Actuated g/C Ratio	0.26	0.26		0.26	0.26	1.00	0.62	0.58	1.00	0.62	0.58	0.58
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	353	876		314	905	1568	324	2045	1568	120	2045	915
v/s Ratio Prot		0.04			0.01		0.00	c0.65		c0.03	0.27	
v/s Ratio Perm	c0.30			0.03		0.12	0.03		0.03	0.59		0.03
v/c Ratio	1.14	0.14		0.11	0.03	0.12	0.06	1.11	0.03	1.01	0.46	0.05
Uniform Delay, d1	44.5	34.3		34.0	33.2	0.0	9.7	25.0	0.0	32.4	14.2	10.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	93.2	0.1		0.2	0.0	0.2	0.1	56.2	0.0	84.4	0.2	0.0
Delay (s)	137.7	34.3		34.2	33.2	0.2	9.8	81.2	0.0	116.8	14.3	10.8
Level of Service	F	C		C	C	A	A	F	A	F	B	B
Approach Delay (s)		110.3			8.4			78.8			25.1	
Approach LOS		F			A			E			C	

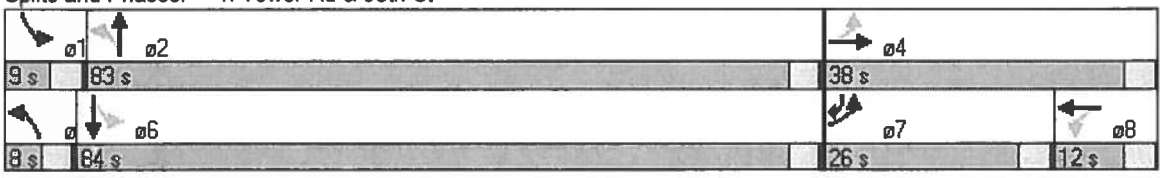
Intersection Summary			
HCM Average Control Delay	64.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	307	87	30	19	154	15	1857	44	98	754	64
Turn Type	pm+pt		Perm		Free	pm+pt		Free	pm+pt		pm+ov
Protected Phases	7	4		8		5	2		1	6	7
Permitted Phases	4		8		Free	2		Free	6		6
Detector Phase	7	4	8	8		5	2		1	6	7
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0		8.0	20.0		8.0	20.0	8.0
Total Split (s)	26.0	38.0	12.0	12.0	0.0	8.0	83.0	0.0	9.0	84.0	26.0
Total Split (%)	20.0%	29.2%	9.2%	9.2%	0.0%	6.2%	63.8%	0.0%	6.9%	64.6%	20.0%
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5	0.5		0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead		Lag	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	Min		Min	C-Min		Min	C-Min	None
Act Effct Green (s)	33.4	33.4	7.4	7.4	130.0	83.4	79.0	130.0	85.8	80.2	106.2
Actuated g/C Ratio	0.26	0.26	0.06	0.06	1.00	0.64	0.61	1.00	0.66	0.62	0.82
v/c Ratio	1.08	0.16	0.52	0.12	0.12	0.05	1.06	0.03	0.92	0.43	0.06
Control Delay	113.4	30.7	85.3	59.1	0.1	7.3	64.9	0.0	88.1	12.4	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	113.4	30.7	85.3	59.1	0.1	7.3	64.9	0.0	88.1	12.4	1.1
LOS	F	C	F	E	A	A	E	A	F	B	A
Approach Delay		91.4		18.4			62.9			19.7	
Approach LOS		F		B			E			B	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 52 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.08
Intersection Signal Delay: 52.6 Intersection LOS: D
Intersection Capacity Utilization 90.4% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Tower Rd & 98th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	307	87	24	30	19	154	15	1857	44	98	754	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3390		1752	3505	1568	1752	3505	1568	1752	3505	1568
Flt Permitted	0.48	1.00		0.66	1.00	1.00	0.25	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	888	3390		1216	3505	1568	470	3505	1568	92	3505	1568
Peak-hour factor, PHF	0.76	0.76	0.76	0.84	0.84	0.84	0.82	0.82	0.82	0.81	0.81	0.81
Adj. Flow (vph)	404	114	32	36	23	183	18	2265	54	121	931	79
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	0	17
Lane Group Flow (vph)	404	126	0	36	23	183	18	2265	54	121	931	62
Turn Type	pm+pt			Perm		Free	pm+pt		Free	pm+pt		pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	4			8		Free	2		Free	6		6
Actuated Green, G (s)	33.4	33.4		7.4	7.4	130.0	83.4	79.0	130.0	85.8	80.2	102.2
Effective Green, g (s)	33.4	33.4		7.4	7.4	130.0	83.4	79.0	130.0	85.8	80.2	102.2
Actuated g/C Ratio	0.26	0.26		0.06	0.06	1.00	0.64	0.61	1.00	0.66	0.62	0.79
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	374	871		69	200	1568	345	2130	1568	132	2162	1281
v/s Ratio Prot	c0.18	0.04			0.01		0.00	c0.65		c0.04	0.27	0.01
v/s Ratio Perm	c0.09			0.03		c0.12	0.03		0.03	0.56		0.03
v/c Ratio	1.08	0.14		0.52	0.12	0.12	0.05	1.06	0.03	0.92	0.43	0.05
Uniform Delay, d1	46.5	37.3		59.6	58.2	0.0	9.2	25.5	0.0	39.0	13.0	3.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.29	0.90	2.10
Incremental Delay, d2	69.7	0.1		6.9	0.3	0.2	0.1	38.9	0.0	52.4	0.6	0.0
Delay (s)	116.1	37.4		66.5	58.4	0.2	9.2	64.4	0.0	102.6	12.2	6.5
Level of Service	F	D		E	E	A	A	E	A	F	B	A
Approach Delay (s)		95.2			15.6			62.5			21.5	
Approach LOS		F			B			E			C	

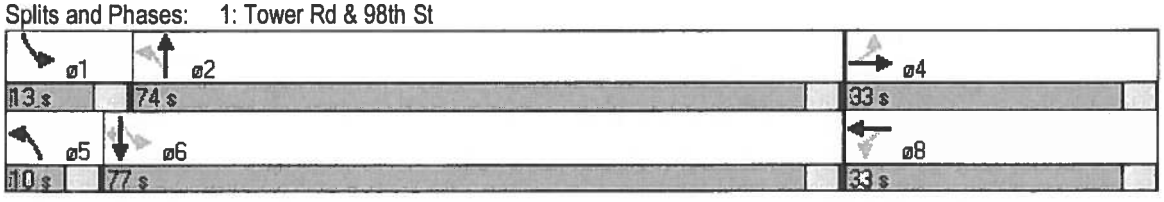
Intersection Summary			
HCM Average Control Delay	53.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	163	47	64	102	95	73	1015	48	128	1758	358
Turn Type	Perm		Perm		Free	pm+pt		Free	pm+pt		Perm
Protected Phases		4		8		5	2		1	6	
Permitted Phases	4		8		Free	2		Free	6		6
Detector Phase	4	4	8	8		5	2		1	6	6
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0		8.0	20.0		8.0	20.0	20.0
Total Split (s)	33.0	33.0	33.0	33.0	0.0	10.0	74.0	0.0	13.0	77.0	77.0
Total Split (%)	27.5%	27.5%	27.5%	27.5%	0.0%	8.3%	61.7%	0.0%	10.8%	64.2%	64.2%
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5	0.5		0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	Min		Min	C-Min		Min	C-Min	C-Min
Act Effct Green (s)	24.6	24.6	24.6	24.6	120.0	81.7	75.5	120.0	85.1	77.2	77.2
Actuated g/C Ratio	0.20	0.20	0.20	0.20	1.00	0.68	0.63	1.00	0.71	0.64	0.64
v/c Ratio	0.84	0.18	0.27	0.15	0.06	0.51	0.49	0.03	0.38	0.80	0.33
Control Delay	72.2	19.2	41.3	38.2	0.1	25.8	13.8	0.0	6.1	12.5	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.2	19.2	41.3	38.2	0.1	25.8	13.8	0.0	6.1	12.5	1.5
LOS	E	B	D	D	A	C	B	A	A	B	A
Approach Delay		52.4		25.1			13.9			10.3	
Approach LOS		D		C			B			B	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 57 (48%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 15.9 — Intersection LOS: B
Intersection Capacity Utilization 78.3% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: Tower Rd & 98th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	163	47	50	64	102	95	73	1015	48	128	1758	358
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3234		1752	3505	1568	1752	3505	1568	1752	3505	1568
Flt Permitted	0.68	1.00		0.67	1.00	1.00	0.06	1.00	1.00	0.20	1.00	1.00
Satd. Flow (perm)	1260	3234		1235	3505	1568	102	3505	1568	367	3505	1568
Peak-hour factor, PHF	0.75	0.75	0.75	0.94	0.94	0.94	0.93	0.93	0.93	0.97	0.97	0.97
Adj. Flow (vph)	217	63	67	68	109	101	78	1091	52	132	1812	369
RTOR Reduction (vph)	0	53	0	0	0	0	0	0	0	0	0	103
Lane Group Flow (vph)	217	77	0	68	109	101	78	1091	52	132	1812	266
Turn Type	Perm			Perm		Free	pm+pt		Free	pm+pt		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		Free	2		Free	6		6
Actuated Green, G (s)	24.6	24.6		24.6	24.6	120.0	81.7	75.5	120.0	85.1	77.2	77.2
Effective Green, g (s)	24.6	24.6		24.6	24.6	120.0	81.7	75.5	120.0	85.1	77.2	77.2
Actuated g/C Ratio	0.20	0.20		0.20	0.20	1.00	0.68	0.63	1.00	0.71	0.64	0.64
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	258	663		253	719	1568	155	2205	1568	351	2255	1009
v/s Ratio Prot		0.02			0.03		c0.03	0.31		0.02	c0.52	
v/s Ratio Perm	c0.17			0.06		c0.06	0.32		0.03	0.24		0.17
v/c Ratio	0.84	0.12		0.27	0.15	0.06	0.50	0.49	0.03	0.38	0.80	0.26
Uniform Delay, d1	45.8	38.8		40.1	39.1	0.0	17.7	12.0	0.0	7.5	15.8	9.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.79	0.62	0.40
Incremental Delay, d2	21.2	0.1		0.6	0.1	0.1	2.6	0.8	0.0	0.4	1.8	0.4
Delay (s)	67.0	38.9		40.7	39.2	0.1	20.3	12.8	0.0	6.3	11.6	4.0
Level of Service	E	D		D	D	A	C	B	A	A	B	A
Approach Delay (s)		56.5			25.4			12.7			10.1	
Approach LOS		E			C			B			B	

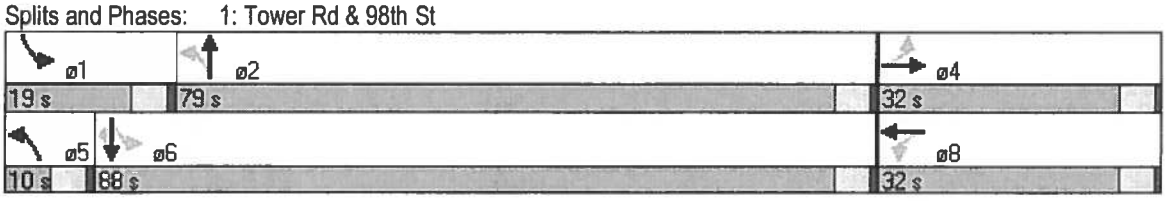
Intersection Summary			
HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	165	47	64	102	149	73	1177	48	183	1923	360
Turn Type	Perm		Perm		Free	pm+pt		Free	pm+pt		Perm
Protected Phases		4		8		5	2		1	6	
Permitted Phases	4		8		Free	2		Free	6		6
Detector Phase	4	4	8	8		5	2		1	6	6
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0		9.0	21.0		9.0	21.0	21.0
Total Split (s)	32.0	32.0	32.0	32.0	0.0	10.0	79.0	0.0	19.0	88.0	88.0
Total Split (%)	24.6%	24.6%	24.6%	24.6%	0.0%	7.7%	60.8%	0.0%	14.6%	67.7%	67.7%
Yellow Time (s)	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag						Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?											
Recall Mode	Min	Min	Min	Min		Min	C-Min		Min	C-Min	C-Min
Act Effct Green (s)	25.2	25.2	25.2	25.2	130.0	85.1	79.6	130.0	93.5	84.3	84.3
Actuated g/C Ratio	0.19	0.19	0.19	0.19	1.00	0.65	0.61	1.00	0.72	0.65	0.65
v/c Ratio	0.90	0.19	0.28	0.16	0.10	0.60	0.59	0.03	0.62	0.87	0.33
Control Delay	87.6	22.0	47.3	43.5	0.1	38.2	17.4	0.0	16.6	14.9	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.6	22.0	47.3	43.5	0.1	38.2	17.4	0.0	16.6	14.9	2.0
LOS	F	C	D	D	A	D	B	A	B	B	A
Approach Delay		63.2		23.8			17.9			13.1	
Approach LOS		E		C			B			B	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 53 (41%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 19.1 — Intersection LOS: B
Intersection Capacity Utilization 85.5% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Tower Rd & 98th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	47	50	64	102	149	73	1177	48	183	1923	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3234		1752	3505	1568	1752	3505	1568	1752	3505	1568
Flt Permitted	0.68	1.00		0.67	1.00	1.00	0.05	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	1260	3234		1235	3505	1568	93	3505	1568	264	3505	1568
Peak-hour factor, PHF	0.75	0.75	0.75	0.94	0.94	0.94	0.93	0.93	0.93	0.97	0.97	0.97
Adj. Flow (vph)	220	63	67	68	109	159	78	1266	52	189	1982	371
RTOR Reduction (vph)	0	54	0	0	0	0	0	0	0	0	0	94
Lane Group Flow (vph)	220	76	0	68	109	159	78	1266	52	189	1982	277
Turn Type	Perm			Perm		Free	pm+pt		Free	pm+pt		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		Free	2		Free	6		6
Actuated Green, G (s)	25.2	25.2		25.2	25.2	130.0	85.1	79.6	130.0	94.5	84.3	84.3
Effective Green, g (s)	25.2	25.2		25.2	25.2	130.0	85.1	79.6	130.0	94.5	84.3	84.3
Actuated g/C Ratio	0.19	0.19		0.19	0.19	1.00	0.65	0.61	1.00	0.73	0.65	0.65
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	244	627		239	679	1568	131	2146	1568	309	2273	1017
v/s Ratio Prot		0.02			0.03		0.03	0.36		c0.05	c0.57	
v/s Ratio Perm	c0.17			0.06		0.10	0.37		0.03	0.40		0.18
v/c Ratio	0.90	0.12		0.28	0.16	0.10	0.60	0.59	0.03	0.61	0.87	0.27
Uniform Delay, d1	51.2	43.3		44.7	43.6	0.0	23.2	15.3	0.0	11.6	18.5	9.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.62	0.59	0.53
Incremental Delay, d2	32.7	0.1		0.7	0.1	0.1	7.1	1.2	0.0	2.3	3.2	0.4
Delay (s)	83.9	43.3		45.4	43.7	0.1	30.3	16.5	0.0	21.0	14.2	5.6
Level of Service	F	D		D	D	A	C	B	A	C	B	A
Approach Delay (s)		68.8			23.4			16.7			13.4	
Approach LOS		E			C			B			B	

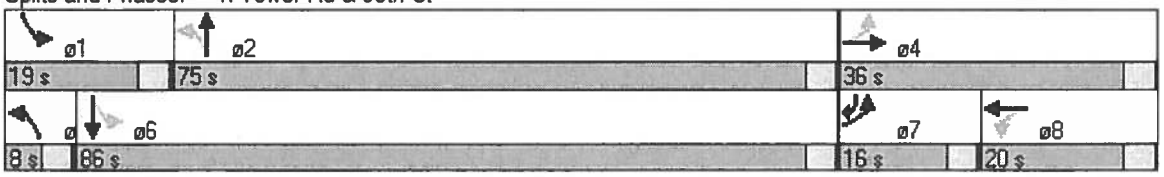
Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Volume (vph)	165	47	64	102	149	73	1177	48	183	1923	360
Turn Type	pm+pt		Perm		Free	pm+pt		Free	pm+pt		pm+ov
Protected Phases	7	4		8		5	2		1	6	7
Permitted Phases	4		8		Free	2		Free	6		6
Detector Phase	7	4	8	8		5	2		1	6	7
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0		8.0	20.0		8.0	20.0	8.0
Total Split (s)	16.0	36.0	20.0	20.0	0.0	8.0	75.0	0.0	19.0	86.0	16.0
Total Split (%)	12.3%	27.7%	15.4%	15.4%	0.0%	6.2%	57.7%	0.0%	14.6%	66.2%	12.3%
Yellow Time (s)	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5	0.5		0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead		Lag	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?											
Recall Mode	None	Min	Min	Min		Min	C-Min		Min	C-Min	None
Act Effct Green (s)	28.5	28.5	12.1	12.1	130.0	84.9	78.9	130.0	92.1	83.4	99.9
Actuated g/C Ratio	0.22	0.22	0.09	0.09	1.00	0.65	0.61	1.00	0.71	0.64	0.77
v/c Ratio	0.77	0.17	0.59	0.34	0.10	0.57	0.59	0.03	0.62	0.88	0.29
Control Delay	64.2	20.4	76.4	57.0	0.1	34.7	18.0	0.0	16.7	25.5	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	20.4	76.4	57.0	0.1	34.7	18.0	0.0	16.7	25.5	1.4
LOS	E	C	E	E	A	C	B	A	B	C	A
Approach Delay		47.9		34.0			18.3			21.3	
Approach LOS		D		C			B			C	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 23.3 — Intersection LOS: C
Intersection Capacity Utilization 83.0% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Tower Rd & 98th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	47	50	64	102	149	73	1177	48	183	1923	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3234		1752	3505	1568	1752	3505	1568	1752	3505	1568
Flt Permitted	0.51	1.00		0.67	1.00	1.00	0.05	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	947	3234		1235	3505	1568	94	3505	1568	258	3505	1568
Peak-hour factor, PHF	0.75	0.75	0.75	0.94	0.94	0.94	0.93	0.93	0.93	0.97	0.97	0.97
Adj. Flow (vph)	220	63	67	68	109	159	78	1266	52	189	1982	371
RTOR Reduction (vph)	0	52	0	0	0	0	0	0	0	0	0	83
Lane Group Flow (vph)	220	78	0	68	109	159	78	1266	52	189	1982	288
Turn Type	pm+pt			Perm		Free	pm+pt		Free	pm+pt		pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	4			8		Free	2		Free	6		6
Actuated Green, G (s)	28.6	28.6		12.1	12.1	130.0	84.9	78.9	130.0	93.4	83.4	95.9
Effective Green, g (s)	28.6	28.6		12.1	12.1	130.0	84.9	78.9	130.0	93.4	83.4	95.9
Actuated g/C Ratio	0.22	0.22		0.09	0.09	1.00	0.65	0.61	1.00	0.72	0.64	0.74
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	286	711		115	326	1568	138	2127	1568	306	2249	1205
v/s Ratio Prot	c0.07	0.02			0.03		0.03	0.36		c0.05	c0.57	0.02
v/s Ratio Perm	c0.10			0.06		0.10	0.35		0.03	0.39		0.16
v/c Ratio	0.77	0.11		0.59	0.33	0.10	0.57	0.60	0.03	0.62	0.88	0.24
Uniform Delay, d1	45.9	40.5		56.6	55.2	0.0	24.0	15.7	0.0	12.3	19.2	5.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.8	0.1		7.9	0.6	0.1	5.2	1.2	0.0	3.7	5.4	0.1
Delay (s)	57.6	40.6		64.5	55.8	0.1	29.2	17.0	0.0	16.0	24.6	5.5
Level of Service	E	D		E	E	A	C	B	A	B	C	A
Approach Delay (s)		51.3			31.2			17.0			21.2	
Approach LOS		D			C			B			C	

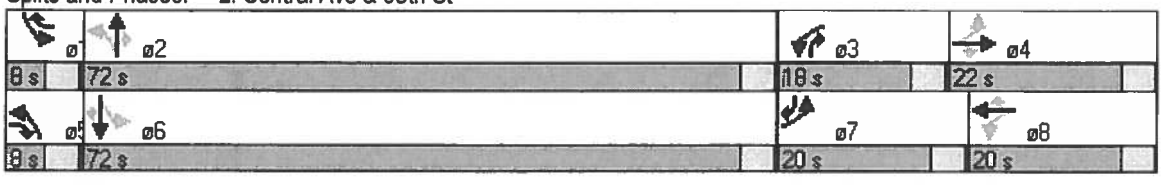
Intersection Summary			
HCM Average Control Delay	22.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	341	221	20	137	174	135	45	1821	463	133	679	185
Turn Type	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	8.0
Total Split (s)	20.0	22.0	8.0	18.0	20.0	8.0	8.0	72.0	18.0	8.0	72.0	20.0
Total Split (%)	16.7%	18.3%	6.7%	15.0%	16.7%	6.7%	6.7%	60.0%	15.0%	6.7%	60.0%	16.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min	Min	Min	C-Min	Min	Min	C-Min	Min
Act Effct Green (s)	31.1	15.7	25.3	25.3	12.5	24.0	73.6	68.0	84.8	77.0	69.9	89.9
Actuated g/C Ratio	0.26	0.13	0.21	0.21	0.10	0.20	0.61	0.57	0.71	0.64	0.58	0.75
v/c Ratio	1.33	0.61	0.07	0.55	0.54	0.47	0.15	1.10	0.49	1.02	0.43	0.19
Control Delay	199.9	55.2	14.0	42.5	56.0	43.8	5.0	69.7	3.7	103.7	15.1	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	199.9	55.2	14.0	42.5	56.0	43.8	5.0	69.7	3.7	103.7	15.1	0.9
LOS	F	E	B	D	E	D	A	E	A	F	B	A
Approach Delay		138.6			48.2			55.3			24.3	
Approach LOS		F			D			E			C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.33
Intersection Signal Delay: 58.6 — Intersection LOS: E
Intersection Capacity Utilization 94.7% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 2: Central Ave & 98th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	341	221	20	137	174	135	45	1821	463	133	679	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	3505	1568	1752	3505	1568
Flt Permitted	0.40	1.00	1.00	0.48	1.00	1.00	0.27	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	736	3505	1568	890	3505	1568	494	3505	1568	106	3505	1568
Peak-hour factor, PHF	0.79	0.79	0.79	0.89	0.89	0.89	0.83	0.83	0.83	0.77	0.77	0.77
Adj. Flow (vph)	432	280	25	154	196	152	54	2194	558	173	882	240
RTOR Reduction (vph)	0	0	21	0	0	12	0	0	26	0	0	68
Lane Group Flow (vph)	432	280	4	154	196	140	54	2194	532	173	882	172
Turn Type	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	31.7	15.7	21.3	25.3	12.5	20.0	73.6	68.0	80.8	77.4	69.9	85.9
Effective Green, g (s)	31.7	15.7	21.3	25.3	12.5	20.0	73.6	68.0	80.8	77.4	69.9	85.9
Actuated g/C Ratio	0.26	0.13	0.18	0.21	0.10	0.17	0.61	0.57	0.67	0.64	0.58	0.72
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	330	459	331	280	365	314	362	1986	1108	171	2042	1175
v/s Ratio Prot	c0.17	0.08	0.00	0.06	0.06	0.03	0.01	c0.63	0.05	c0.06	0.25	0.02
v/s Ratio Perm	c0.17		0.00	0.06		0.06	0.08		0.29	0.59		0.09
v/c Ratio	1.31	0.61	0.01	0.55	0.54	0.45	0.15	1.10	0.48	1.01	0.43	0.15
Uniform Delay, d1	41.8	49.3	40.7	41.0	51.0	45.0	9.9	26.0	9.5	38.9	14.0	5.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.58	0.59	0.44	1.00	1.00	1.00
Incremental Delay, d2	159.3	2.4	0.0	2.3	1.5	1.0	0.1	51.7	0.2	71.9	0.7	0.1
Delay (s)	201.0	51.7	40.7	43.3	52.5	46.0	5.8	67.1	4.3	110.8	14.6	5.5
Level of Service	F	D	D	D	D	D	A	E	A	F	B	A
Approach Delay (s)		138.8			47.7			53.4			25.8	
Approach LOS		F			D			D			C	

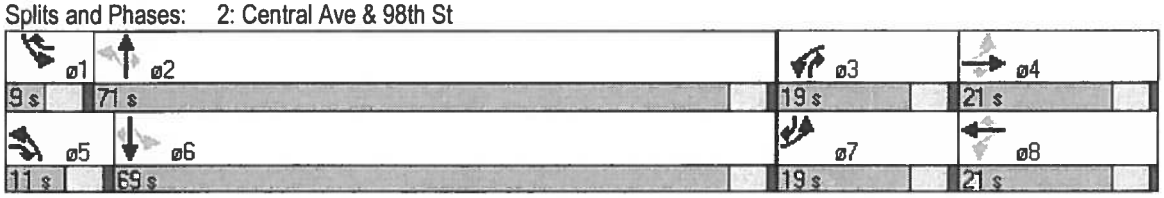
Intersection Summary			
HCM Average Control Delay	58.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	341	221	28	208	158	135	80	1862	487	133	725	185
Turn Type	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	21.0	9.0	9.0	21.0	9.0	9.0	21.0	9.0	9.0	21.0	9.0
Total Split (s)	19.0	21.0	11.0	19.0	21.0	9.0	11.0	71.0	19.0	9.0	69.0	19.0
Total Split (%)	15.8%	17.5%	9.2%	15.8%	17.5%	7.5%	9.2%	59.2%	15.8%	7.5%	57.5%	15.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min	Min	Min	C-Min	Min	Min	C-Min	Min
Act Effct Green (s)	28.2	14.2	25.7	27.9	14.0	25.0	72.5	66.0	84.8	71.5	65.5	84.5
Actuated g/C Ratio	0.24	0.12	0.21	0.23	0.12	0.21	0.60	0.55	0.71	0.60	0.55	0.70
v/c Ratio	1.29	0.68	0.10	0.81	0.44	0.45	0.29	1.16	0.52	1.16	0.49	0.20
Control Delay	187.5	59.1	12.5	59.0	52.3	42.5	7.2	96.9	5.2	150.6	18.3	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	187.5	59.1	12.5	59.0	52.3	42.5	7.2	96.9	5.2	150.6	18.3	1.2
LOS	F	E	B	E	D	D	A	F	A	F	B	A
Approach Delay		131.2			52.4			75.5			32.2	
Approach LOS		F			D			E			C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.29
Intersection Signal Delay: 70.1 — Intersection LOS: E
Intersection Capacity Utilization 98.8% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 2: Central Ave & 98th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	341	221	28	208	158	135	80	1862	487	133	725	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	3505	1568	1752	3505	1568
Flt Permitted	0.59	1.00	1.00	0.40	1.00	1.00	0.23	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1095	3505	1568	746	3505	1568	422	3505	1568	113	3505	1568
Peak-hour factor, PHF	0.79	0.79	0.79	0.89	0.89	0.89	0.83	0.83	0.83	0.77	0.77	0.77
Adj. Flow (vph)	432	280	35	234	178	152	96	2243	587	173	942	240
RTOR Reduction (vph)	0	0	29	0	0	12	0	0	20	0	0	81
Lane Group Flow (vph)	432	280	6	234	178	140	96	2243	567	173	942	159
Turn Type	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	28.2	14.2	20.7	27.8	14.0	20.0	72.5	66.0	79.8	71.5	65.5	79.5
Effective Green, g (s)	28.2	14.2	20.7	27.8	14.0	20.0	72.5	66.0	79.8	71.5	65.5	79.5
Actuated g/C Ratio	0.24	0.12	0.17	0.23	0.12	0.17	0.60	0.55	0.66	0.60	0.55	0.66
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	334	415	336	289	409	327	327	1928	1108	149	1913	1104
v/s Ratio Prot	c0.15	0.08	0.00	0.09	0.05	0.02	0.02	c0.64	0.06	c0.06	0.27	0.02
v/s Ratio Perm	c0.15		0.00	0.09		0.07	0.16		0.30	0.63		0.08
v/c Ratio	1.29	0.67	0.02	0.81	0.44	0.43	0.29	1.16	0.51	1.16	0.49	0.14
Uniform Delay, d1	44.5	50.7	41.2	41.1	49.3	44.9	11.3	27.0	10.2	34.9	16.9	7.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.68	0.63	0.58	1.00	1.00	1.00
Incremental Delay, d2	152.6	4.3	0.0	15.3	0.7	0.9	0.3	77.0	0.2	123.6	0.9	0.1
Delay (s)	197.1	55.0	41.2	56.4	50.1	45.8	8.0	94.0	6.2	158.5	17.8	7.6
Level of Service	F	D	D	E	D	D	A	F	A	F	B	A
Approach Delay (s)		136.5			51.5			73.6			34.0	
Approach LOS		F			D			E			C	

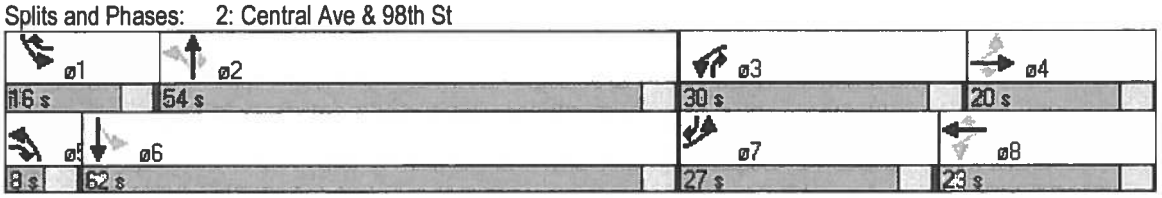
Intersection Summary			
HCM Average Control Delay	70.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	98.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	288	206	58	468	289	141	40	1033	244	183	1669	247
Turn Type	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	8.0
Total Split (s)	27.0	20.0	8.0	30.0	23.0	16.0	8.0	54.0	30.0	16.0	62.0	27.0
Total Split (%)	22.5%	16.7%	6.7%	25.0%	19.2%	13.3%	6.7%	45.0%	25.0%	13.3%	51.7%	22.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min	Min	Min	C-Min	Min	Min	C-Min	Min
Act Effct Green (s)	35.3	13.5	22.8	42.9	17.8	33.0	58.5	53.2	83.2	68.3	59.2	84.9
Actuated g/C Ratio	0.29	0.11	0.19	0.36	0.15	0.28	0.49	0.44	0.69	0.57	0.49	0.71
v/c Ratio	0.85	0.64	0.22	1.13	0.62	0.32	0.31	0.71	0.23	0.71	1.00	0.22
Control Delay	50.7	58.2	26.9	115.4	53.6	18.9	18.1	24.6	2.4	31.7	51.4	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.7	58.2	26.9	115.4	53.6	18.9	18.1	24.6	2.4	31.7	51.4	2.8
LOS	D	E	C	F	D	B	B	C	A	C	D	A
Approach Delay		51.0			80.3			20.3			43.9	
Approach LOS		D			F			C			D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.13
Intersection Signal Delay: 45.4 — Intersection LOS: D
Intersection Capacity Utilization 94.4% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 2: Central Ave & 98th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	288	206	58	468	289	141	40	1033	244	183	1669	247
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	3505	1568	1752	3505	1568
Flt Permitted	0.46	1.00	1.00	0.31	1.00	1.00	0.08	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	854	3505	1568	570	3505	1568	139	3505	1568	214	3505	1568
Peak-hour factor, PHF	0.82	0.82	0.82	0.90	0.90	0.90	0.94	0.94	0.94	0.97	0.97	0.97
Adj. Flow (vph)	351	251	71	520	321	157	43	1099	260	189	1721	255
RTOR Reduction (vph)	0	0	25	0	0	59	0	0	46	0	0	49
Lane Group Flow (vph)	351	251	46	520	321	98	43	1099	214	189	1721	206
Turn Type	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	35.2	13.5	18.8	43.5	17.8	29.1	58.5	53.2	79.2	68.5	59.2	80.9
Effective Green, g (s)	35.2	13.5	18.8	43.5	17.8	29.1	58.5	53.2	79.2	68.5	59.2	80.9
Actuated g/C Ratio	0.29	0.11	0.16	0.36	0.15	0.24	0.49	0.44	0.66	0.57	0.49	0.67
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	413	394	298	463	520	433	139	1554	1087	267	1729	1109
v/s Ratio Prot	0.15	0.07	0.01	c0.24	0.09	0.02	0.01	0.31	0.04	c0.07	c0.49	0.03
v/s Ratio Perm	0.10		0.02	c0.16		0.04	0.14		0.09	0.34		0.10
v/c Ratio	0.85	0.64	0.15	1.12	0.62	0.23	0.31	0.71	0.20	0.71	1.00	0.19
Uniform Delay, d1	37.5	50.9	43.7	34.2	47.9	36.4	26.5	27.1	8.0	19.3	30.3	7.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.79	0.56	1.00	1.00	1.00
Incremental Delay, d2	15.0	3.4	0.2	80.0	2.2	0.3	1.2	2.5	0.1	8.3	20.6	0.1
Delay (s)	52.5	54.3	44.0	114.1	50.1	36.7	26.5	23.8	4.5	27.6	50.8	7.4
Level of Service	D	D	D	F	D	D	C	C	A	C	D	A
Approach Delay (s)		52.3			81.4			20.3			43.7	
Approach LOS		D			F			C			D	

Intersection Summary			
HCM Average Control Delay	45.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	288	206	67	547	270	141	85	1084	274	183	1719	247
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	3505	1568	1752	3505	1568
Flt Permitted	0.57	1.00	1.00	0.31	1.00	1.00	0.08	1.00	1.00	0.08	1.00	1.00
Satd. Flow (perm)	1049	3505	1568	571	3505	1568	139	3505	1568	149	3505	1568
Peak-hour factor, PHF	0.82	0.82	0.82	0.90	0.90	0.90	0.94	0.94	0.94	0.97	0.97	0.97
Adj. Flow (vph)	351	251	82	608	300	157	90	1153	291	189	1772	255
RTOR Reduction (vph)	0	0	20	0	0	61	0	0	39	0	0	34
Lane Group Flow (vph)	351	251	62	608	300	96	90	1153	252	189	1772	221
Turn Type	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	37.8	14.1	19.7	49.1	20.4	33.1	58.8	53.2	83.2	70.9	60.3	84.0
Effective Green, g (s)	37.8	14.1	19.7	49.1	20.4	33.1	58.8	53.2	83.2	70.9	60.3	84.0
Actuated g/C Ratio	0.29	0.11	0.15	0.38	0.16	0.25	0.45	0.41	0.64	0.55	0.46	0.65
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	433	380	298	488	550	460	132	1434	1064	238	1626	1073
v/s Ratio Prot	0.15	0.07	0.01	c0.29	0.09	0.02	0.03	0.33	0.05	c0.08	c0.51	0.04
v/s Ratio Perm	0.09		0.03	c0.18		0.04	0.28		0.11	0.36		0.10
v/c Ratio	0.81	0.66	0.21	1.25	0.55	0.21	0.68	0.80	0.24	0.79	1.09	0.21
Uniform Delay, d1	40.9	55.7	48.3	35.9	50.5	38.1	30.3	33.8	9.9	31.0	34.8	9.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.09	0.77	0.66	1.00	1.00	1.00
Incremental Delay, d2	11.0	4.3	0.4	126.9	1.1	0.2	10.6	3.8	0.1	16.5	51.0	0.1
Delay (s)	51.9	59.9	48.7	162.8	51.6	38.4	43.8	29.7	6.7	47.5	85.9	9.5
Level of Service	D	E	D	F	D	D	D	C	A	D	F	A
Approach Delay (s)		54.4			113.2			26.2			73.8	
Approach LOS		D			F			C			E	

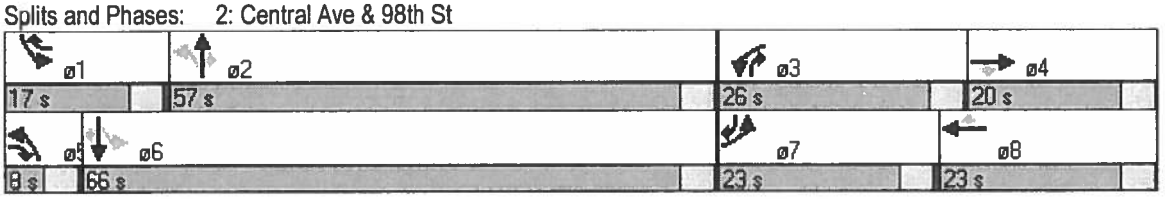
Intersection Summary			
HCM Average Control Delay	65.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	288	206	67	547	270	141	85	1084	274	183	1719	247
Turn Type	Prot		pm+ov	Prot		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8	2		2	6		6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0	8.0
Total Split (s)	23.0	20.0	8.0	26.0	23.0	17.0	8.0	57.0	26.0	17.0	66.0	23.0
Total Split (%)	19.2%	16.7%	6.7%	21.7%	19.2%	14.2%	6.7%	47.5%	21.7%	14.2%	55.0%	19.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min	Min	Min	C-Min	Min	Min	C-Min	Min
Act Effct Green (s)	16.8	13.5	23.4	22.0	18.7	34.0	63.1	57.2	83.2	71.6	62.6	83.4
Actuated g/C Ratio	0.14	0.11	0.20	0.18	0.16	0.28	0.53	0.48	0.69	0.60	0.52	0.70
v/c Ratio	0.74	0.64	0.26	0.98	0.55	0.33	0.61	0.69	0.26	0.69	0.97	0.23
Control Delay	59.0	58.2	38.0	79.6	51.1	27.3	38.2	22.3	2.4	28.0	43.3	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	58.2	38.0	79.6	51.1	27.3	38.2	22.3	2.4	28.0	43.3	4.0
LOS	E	E	D	E	D	C	D	C	A	C	D	A
Approach Delay		56.2			63.9			19.5			37.5	
Approach LOS		E			E			B			D	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 39.9 — Intersection LOS: D
Intersection Capacity Utilization 86.9% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2: Central Ave & 98th St



Terry O. Brown, P.E.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	288	206	67	547	270	141	85	1084	274	183	1719	247
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3505	1568	3400	3505	1568	1752	3505	1568	1752	3505	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.07	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	3400	3505	1568	3400	3505	1568	129	3505	1568	217	3505	1568
Peak-hour factor, PHF	0.82	0.82	0.82	0.90	0.90	0.90	0.94	0.94	0.94	0.97	0.97	0.97
Adj. Flow (vph)	351	251	82	608	300	157	90	1153	291	189	1772	255
RTOR Reduction (vph)	0	0	8	0	0	29	0	0	50	0	0	36
Lane Group Flow (vph)	351	251	74	608	300	129	90	1153	241	189	1772	219
Turn Type	Prot		pm+ov	Prot		pm+ov	pm+pt		pm+ov	pm+pt		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8	2		2	6		6
Actuated Green, G (s)	16.8	13.5	19.4	22.0	18.7	30.0	63.1	57.2	79.2	72.5	62.6	79.4
Effective Green, g (s)	16.8	13.5	19.4	22.0	18.7	30.0	63.1	57.2	79.2	72.5	62.6	79.4
Actuated g/C Ratio	0.14	0.11	0.16	0.18	0.16	0.25	0.53	0.48	0.66	0.60	0.52	0.66
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	476	394	306	623	546	444	148	1671	1087	276	1828	1090
v/s Ratio Prot	0.10	0.07	0.01	c0.18	c0.09	0.03	0.03	0.33	0.04	c0.06	c0.51	0.03
v/s Ratio Perm			0.04			0.05	0.29		0.11	0.35		0.11
v/c Ratio	0.74	0.64	0.24	0.98	0.55	0.29	0.61	0.69	0.22	0.68	0.97	0.20
Uniform Delay, d1	49.5	50.9	43.9	48.7	46.8	36.4	26.3	24.5	8.1	17.8	27.8	7.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.16	0.79	0.52	1.00	1.00	1.00
Incremental Delay, d2	5.9	3.4	0.4	29.8	1.1	0.4	6.4	2.2	0.1	6.9	14.9	0.1
Delay (s)	55.4	54.3	44.3	78.5	47.9	36.7	37.1	21.5	4.3	24.7	42.7	8.0
Level of Service	E	D	D	E	D	D	D	C	A	C	D	A
Approach Delay (s)		53.6			63.7			19.1			37.2	
Approach LOS		D			E			B			D	

Intersection Summary			
HCM Average Control Delay	39.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	1	28	11	1	53	9	2192	6	11	604	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.75	0.75	0.75	0.91	0.91	0.91	0.93	0.93	0.93
Hourly flow rate (vph)	59	1	37	15	1	71	10	2409	7	12	649	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								1			1	
Upstream signal (ft)											1067	
pX, platoon unblocked												
vC, conflicting volume	1976	3116	332	2818	3120	1208	665			2415		
vC1, stage 1 conf vol	681	681		2432	2432							
vC2, stage 2 conf vol	1296	2435		386	688							
vCu, unblocked vol	1976	3116	332	2818	3120	1208	665			2415		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	14	97	94	47	97	59	99			94		
cM capacity (veh/h)	69	41	661	28	50	174	914			191		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	97	87	10	1606	810	12	433	232
Volume Left	59	15	10	0	0	12	0	0
Volume Right	37	71	0	0	7	0	0	15
cSH	103	90	914	1700	1700	191	1700	1700
Volume to Capacity	0.95	0.96	0.01	0.94	0.48	0.06	0.25	0.14
Queue Length 95th (ft)	143	137	1	0	0	5	0	0
Control Delay (s)	150.6	168.0	9.0	0.0	0.0	25.1	0.0	0.0
Lane LOS	F	F	A			D		
Approach Delay (s)	150.6	168.0	0.0			0.4		
Approach LOS	F	F						

Intersection Summary				
Average Delay	9.0			
Intersection Capacity Utilization	78.4%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	1	28	11	4	73	9	2397	6	32	785	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.75	0.75	0.75	0.91	0.91	0.91	0.93	0.93	0.93
Hourly flow rate (vph)	59	1	37	15	5	97	10	2634	7	34	844	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								1			1	
Upstream signal (ft)											1066	
pX, platoon unblocked												
vC, conflicting volume	2357	3581	430	3186	3585	1320	859			2641		
vC1, stage 1 conf vol	920	920		2657	2657							
vC2, stage 2 conf vol	1437	2660		528	928							
vCu, unblocked vol	2357	3581	430	3186	3585	1320	859			2641		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	87	94	25	85	33	99			78		
cM capacity (veh/h)	5	10	571	19	36	146	771			155		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	97	117	10	1756	885	34	563	296
Volume Left	59	15	10	0	0	34	0	0
Volume Right	37	97	0	0	7	0	0	15
cSH	9	75	771	1700	1700	155	1700	1700
Volume to Capacity	11.41	1.57	0.01	1.03	0.52	0.22	0.33	0.17
Queue Length 95th (ft)	Err	245	1	0	0	20	0	0
Control Delay (s)	Err	405.2	9.7	0.0	0.0	34.7	0.0	0.0
Lane LOS	F	F	A			D		
Approach Delay (s)	Err	405.2	0.0			1.3		
Approach LOS	F	F						

Intersection Summary				
Average Delay	272.0			
Intersection Capacity Utilization	84.0%	ICU Level of Service	E	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	1	21	16	3	16	26	1301	16	66	2367	96
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.75	0.75	0.75	0.85	0.85	0.85	0.90	0.90	0.90
Hourly flow rate (vph)	60	1	25	21	4	21	31	1531	19	73	2630	107
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								1			1	
Upstream signal (ft)											1067	
pX, platoon unblocked	0.53	0.53	0.53	0.53	0.53		0.53					
vC, conflicting volume	3680	4441	1368	3088	4485	775	2737			1549		
vC1, stage 1 conf vol	2830	2830		1601	1601							
vC2, stage 2 conf vol	850	1611		1487	2883							
vCu, unblocked vol	4282	5716	0	3167	5799	775	2504			1549		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	90	96	61	0	94	67			83		
cM capacity (veh/h)	8	11	573	54	0	339	93			419		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	86	47	31	1020	529	73	1753	983
Volume Left	60	21	31	0	0	73	0	0
Volume Right	25	21	0	0	19	0	0	107
cSH	11	1	93	1700	1700	419	1700	1700
Volume to Capacity	7.50	91.30	0.33	0.60	0.31	0.17	1.03	0.58
Queue Length 95th (ft)	Err	Err	31	0	0	16	0	0
Control Delay (s)	Err	Err	61.3	0.0	0.0	15.4	0.0	0.0
Lane LOS	F	F	F			C		
Approach Delay (s)	Err	Err	1.2			0.4		
Approach LOS	F	F						

Intersection Summary				
Average Delay	293.4			
Intersection Capacity Utilization	81.5%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	1	21	16	7	37	26	1524	16	92	2593	96
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.75	0.75	0.75	0.85	0.85	0.85	0.90	0.90	0.90
Hourly flow rate (vph)	60	1	25	21	9	49	31	1793	19	102	2881	107
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								Raised			Raised	
Median storage veh)								1			1	
Upstream signal (ft)											1066	
pX, platoon unblocked	0.56	0.56	0.56	0.56	0.56		0.56					
vC, conflicting volume	4151	5012	1494	3534	5056	906	2988			1812		
vC1, stage 1 conf vol	3139	3139		1864	1864							
vC2, stage 2 conf vol	1012	1873		1671	3192							
vCu, unblocked vol	5044	6574	325	3949	6652	906	2978			1812		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	93	17	0	82	52			69		
cM capacity (veh/h)	0	0	376	26	0	277	64			331		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	86	80	31	1195	616	102	1921	1067
Volume Left	60	21	31	0	0	102	0	0
Volume Right	25	49	0	0	19	0	0	107
cSH	0	0	64	1700	1700	331	1700	1700
Volume to Capacity	Err	1273.15	0.48	0.70	0.36	0.31	1.13	0.63
Queue Length 95th (ft)	Err	Err	47	0	0	32	0	0
Control Delay (s)	Err	Err	105.3	0.0	0.0	20.7	0.0	0.0
Lane LOS	F	F	F			C		
Approach Delay (s)	Err	Err	1.7			0.7		
Approach LOS	F	F						

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	92.4%	ICU Level of Service	F	
Analysis Period (min)	15			

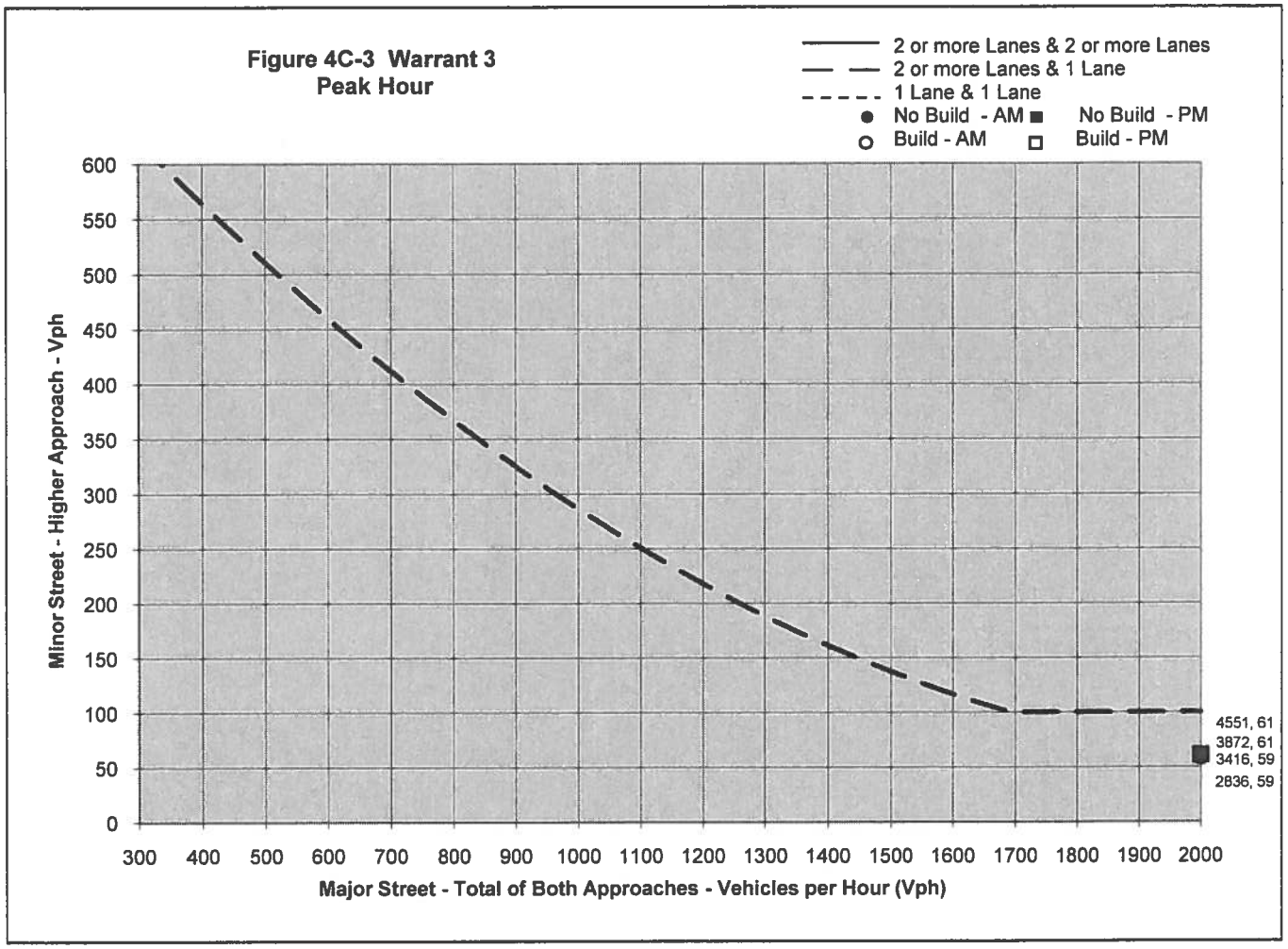
Project Name
Colucci Commercial Development
Intersection
Sunset Gardens Ave. / 98th St.
Analysis Year
2012

Number of Lanes

Major St.	2
Minor St.	1

Analysis Year Traffic Volumes

AM	Major	Minor	PM	Major	Minor
No Build	2836	59	No Build	3872	61
Build	3416	59	Build	4551	61



Comments -

Developed by DWH

A-64a

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	114	0	2834	1038	74
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	124	0	3080	1128	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				1	1	
Upstream signal (ft)					858	
pX, platoon unblocked	0.87	0.87	0.87			
vC, conflicting volume	2668	564	1209			
vC1, stage 1 conf vol	1128					
vC2, stage 2 conf vol	1540					
vCu, unblocked vol	2620	209	948			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	82	100			
cM capacity (veh/h)	105	693	623			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	124	1540	1540	564	564	80
Volume Left	0	0	0	0	0	0
Volume Right	124	0	0	0	0	80
cSH	693	1700	1700	1700	1700	1700
Volume to Capacity	0.18	0.91	0.91	0.33	0.33	0.05
Queue Length 95th (ft)	16	0	0	0	0	0
Control Delay (s)	11.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	11.3	0.0		0.0		
Approach LOS	B					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	164	0	1698	2834	92
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	193	0	1806	3015	98
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				1	1	
Upstream signal (ft)					858	
pX, platoon unblocked	0.55	0.55	0.55			
vC, conflicting volume	3918	1507	3113			
vC1, stage 1 conf vol	3015					
vC2, stage 2 conf vol	903					
vCu, unblocked vol	4671	283	3205			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	51	100			
cM capacity (veh/h)	11	390	50			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	193	903	903	1507	1507	98
Volume Left	0	0	0	0	0	0
Volume Right	193	0	0	0	0	98
cSH	390	1700	1700	1700	1700	1700
Volume to Capacity	0.49	0.53	0.53	0.89	0.89	0.06
Queue Length 95th (ft)	66	0	0	0	0	0
Control Delay (s)	22.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	22.9	0.0		0.0		
Approach LOS	C					

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	18	70	21	6	3	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	76	23	7	3	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	29				141	26
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	29				141	26
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	99
cM capacity (veh/h)	1577				839	1047

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	96	29	18
Volume Left	20	0	3
Volume Right	0	7	15
cSH	1577	1700	1003
Volume to Capacity	0.01	0.02	0.02
Queue Length 95th (ft)	1	0	1
Control Delay (s)	1.6	0.0	8.7
Lane LOS	A		A
Approach Delay (s)	1.6	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	21.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	19	68	120	9	3	21
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.85	0.85
Hourly flow rate (vph)	23	81	143	11	4	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	154				274	148
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	154				274	148
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	97
cM capacity (veh/h)	1421				702	896

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	104	154	28
Volume Left	23	0	4
Volume Right	0	11	25
cSH	1421	1700	866
Volume to Capacity	0.02	0.09	0.03
Queue Length 95th (ft)	1	0	3
Control Delay (s)	1.8	0.0	9.3
Lane LOS	A		A
Approach Delay (s)	1.8	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization		24.8%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱		↑↑		↱
Volume (veh/h)	566	41	0	397	0	46
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	615	45	0	432	0	50
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				310		
pX, platoon unblocked					0.97	
vC, conflicting volume			660		831	308
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			660		771	308
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	93
cM capacity (veh/h)			918		325	685

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	308	308	45	216	216	50
Volume Left	0	0	0	0	0	0
Volume Right	0	0	45	0	0	50
cSH	1700	1700	1700	1700	1700	685
Volume to Capacity	0.18	0.18	0.03	0.13	0.13	0.07
Queue Length 95th (ft)	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	10.7
Lane LOS						B
Approach Delay (s)	0.0			0.0		10.7
Approach LOS						B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱		↑↑		↱
Volume (veh/h)	528	50	0	567	0	63
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.85	0.85
Hourly flow rate (vph)	644	61	0	691	0	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				310		
pX, platoon unblocked					0.93	
vC, conflicting volume			705		990	322
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			705		830	322
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	89
cM capacity (veh/h)			882		284	671

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	322	322	61	346	346	74
Volume Left	0	0	0	0	0	0
Volume Right	0	0	61	0	0	74
cSH	1700	1700	1700	1700	1700	671
Volume to Capacity	0.19	0.19	0.04	0.20	0.20	0.11
Queue Length 95th (ft)	0	0	0	0	0	9
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	11.0
Lane LOS						B
Approach Delay (s)	0.0			0.0		11.0
Approach LOS						B

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	174	114	309	2152	977	79
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	205	134	372	2593	1177	95
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				1	1	
Upstream signal (ft)					397	
pX, platoon unblocked	0.85	0.85	0.85			
vC, conflicting volume	3218	589	1272			
vC1, stage 1 conf vol	1177					
vC2, stage 2 conf vol	2041					
vCu, unblocked vol	3258	146	956			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	82	38			
cM capacity (veh/h)	27	736	599			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	205	134	372	1296	1296	589	589	95
Volume Left	205	0	372	0	0	0	0	0
Volume Right	0	134	0	0	0	0	0	95
cSH	27	736	599	1700	1700	1700	1700	1700
Volume to Capacity	7.56	0.18	0.62	0.76	0.76	0.35	0.35	0.06
Queue Length 95th (ft)	Err	17	107	0	0	0	0	0
Control Delay (s)	Err	11.0	20.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	B	C					
Approach Delay (s)	6045.4		2.6			0.0		
Approach LOS	F							

Intersection Summary			
Average Delay	449.3		
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	161	166	278	1238	2506	124
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	189	195	296	1317	2666	132
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				Raised	Raised	
Median storage veh)				1	1	
Upstream signal (ft)					397	
pX, platoon unblocked	0.54	0.54	0.54			
vC, conflicting volume	3916	1333	2798			
vC1, stage 1 conf vol	2666					
vC2, stage 2 conf vol	1250					
vCu, unblocked vol	4687	0	2628			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	67	0			
cM capacity (veh/h)	0	587	85			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	189	195	296	659	659	1333	1333	132
Volume Left	189	0	296	0	0	0	0	0
Volume Right	0	195	0	0	0	0	0	132
cSH	0	587	85	1700	1700	1700	1700	1700
Volume to Capacity	Err	0.33	3.47	0.39	0.39	0.78	0.78	0.08
Queue Length 95th (ft)	Err	36	Err	0	0	0	0	0
Control Delay (s)	Err	14.2	1215.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	B	F					
Approach Delay (s)	Err		222.9			0.0		
Approach LOS	F							

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

Traffic Count Data Sheet

Year Counts Taken: **2008**

E-W Street **Tower Rd**
N-S Street: **98th St**

Speed Limit (Tower Rd)= **40** MPH
Speed Limit (98th St)= **45** MPH
Date of Count: **8/7/08**

Begin Time	End Time	Eastbound (Tower Rd)			Westbound (Tower Rd)			Northbound (98th St)			Southbound (98th St)		
		L	T	R	L	T	R	L	T	R	L	T	R
7:00 AM	7:15 AM	**86**	**30**	**8**	**4**	**2**	**18**	**1**	**358**	**7**	**5**	**68**	**9**
7:15 AM	7:30 AM	**78**	**24**	**7**	**5**	**3**	**20**	**1**	**303**	**9**	**6**	**72**	**10**
7:30 AM	7:45 AM	**55**	**16**	**3**	**6**	**6**	**22**	**2**	**296**	**12**	**8**	**86**	**12**
7:45 AM	8:00 AM	**56**	**11**	**3**	**8**	**6**	**14**	**1**	**202**	**8**	**8**	**103**	**12**
8:00 AM	8:15 AM	~~51~~	~~21~~	~~8~~	~~5~~	~~6~~	~~16~~	~~6~~	~~172~~	~~10~~	~~10~~	~~69~~	~~9~~
8:15 AM	8:30 AM	~~44~~	~~12~~	~~13~~	~~8~~	~~6~~	~~14~~	~~3~~	~~203~~	~~7~~	~~7~~	~~68~~	~~11~~
8:30 AM	8:45 AM	~~50~~	~~9~~	~~4~~	~~3~~	~~6~~	~~14~~	~~7~~	~~157~~	~~5~~	~~8~~	~~60~~	~~10~~
8:45 AM	9:00 AM	~~31~~	~~10~~	~~5~~	~~5~~	~~2~~	~~9~~	~~5~~	~~151~~	~~8~~	~~3~~	~~61~~	~~8~~
AM Peak Hour Volumes		**275**	**81**	**21**	**23**	**17**	**74**	**5**	**1159**	**36**	**27**	**329**	**43**
% of Total Traffic		13.2%	3.9%	1.0%	1.1%	0.8%	3.5%	0.2%	55.5%	1.7%	1.3%	15.7%	2.1%
% Directional			18.0%			5.5%			57.4%			19.1%	
AM Peak Hour Factor			*0.76*			*0.84*			*0.82*			*0.81*	

Begin Time	End Time	Eastbound (Tower Rd)			Westbound (Tower Rd)			Northbound (98th St)			Southbound (98th St)		
		L	T	R	L	T	R	L	T	R	L	T	R
4:00 PM	4:15 PM	~~25~~	~~11~~	~~2~~	~~12~~	~~14~~	~~9~~	~~9~~	~~141~~	~~8~~	~~22~~	~~214~~	~~36~~
4:15 PM	4:30 PM	~~24~~	~~9~~	~~9~~	~~21~~	~~11~~	~~14~~	~~16~~	~~148~~	~~8~~	~~13~~	~~220~~	~~45~~
4:30 PM	4:45 PM	~~27~~	~~9~~	~~6~~	~~24~~	~~21~~	~~10~~	~~9~~	~~126~~	~~6~~	~~22~~	~~239~~	~~61~~
4:45 PM	5:00 PM	~~26~~	~~5~~	~~10~~	~~20~~	~~20~~	~~15~~	~~15~~	~~131~~	~~9~~	~~20~~	~~274~~	~~58~~
5:00 PM	5:15 PM	**37**	**7**	**9**	**20**	**21**	**9**	**9**	**151**	**7**	**18**	**289**	**75**
5:15 PM	5:30 PM	**34**	**7**	**8**	**11**	**18**	**27**	**13**	**149**	**8**	**19**	**296**	**70**
5:30 PM	5:45 PM	**47**	**19**	**13**	**17**	**28**	**10**	**10**	**153**	**11**	**30**	**278**	**78**
5:45 PM	6:00 PM	**25**	**11**	**10**	**9**	**23**	**17**	**23**	**154**	**12**	**18**	**270**	**56**
PM Peak Hour Volumes		**143**	**44**	**40**	**57**	**90**	**63**	**55**	**607**	**38**	**85**	**1133**	**279**
% of Total Traffic		5.4%	1.7%	1.5%	2.2%	3.4%	2.4%	2.1%	23.0%	1.4%	3.2%	43.0%	10.6%
% Directional			8.6%			8.0%			26.6%			56.8%	
PM Peak Hour Factor			*0.72*			*0.94*			*0.93*			*0.97*	

Traffic Count Data Sheet

Central / 98th St.

Year Counts Taken: **2007**

E-W Street Central Ave.

N-S Street: 98th St.

UNSIGNALIZED

Speed Limit (Central Ave.)= 55 MPH

Speed Limit (98th St.)= 45 MPH

Date of Count: 11/6/07

Begin Time	End Time	Eastbound (Central Ave.)			Westbound (Central Ave.)			Northbound (98th St.)			Southbound (98th St.)		
		L	T	R	L	T	R	L	T	R	L	T	R
7:00 AM	7:15 AM	**81**	**53**	**10**	**26**	**37**	**8**	**5**	**348**	**91**	**7**	**118**	**56**
7:15 AM	7:30 AM	**64**	**72**	**2**	**32**	**42**	**11**	**7**	**315**	**98**	**12**	**89**	**23**
7:30 AM	7:45 AM	**55**	**38**	**3**	**27**	**27**	**17**	**10**	**222**	**69**	**7**	**93**	**20**
7:45 AM	8:00 AM	**31**	**43**	**3**	**29**	**35**	**11**	**3**	**236**	**71**	**8**	**99**	**23**
8:00 AM	8:15 AM	~~31~~	~~29~~	~~1~~	~~34~~	~~29~~	~~7~~	~~5~~	~~209~~	~~48~~	~~2~~	~~62~~	~~23~~
8:15 AM	8:30 AM	~~36~~	~~28~~	~~6~~	~~25~~	~~27~~	~~3~~	~~6~~	~~207~~	~~40~~	~~7~~	~~62~~	~~9~~
8:30 AM	8:45 AM	~~18~~	~~24~~	~~4~~	~~22~~	~~24~~	~~9~~	~~7~~	~~152~~	~~49~~	~~13~~	~~67~~	~~17~~
8:45 AM	9:00 AM	~~16~~	~~37~~	~~7~~	~~25~~	~~17~~	~~6~~	~~3~~	~~115~~	~~36~~	~~13~~	~~59~~	~~26~~
AM Peak Hour Volumes		**231**	**206**	**18**	**114**	**141**	**47**	**25**	**1121**	**329**	**34**	**399**	**122**
% of Total Traffic		8.3%	7.4%	0.6%	4.1%	5.1%	1.7%	0.9%	40.2%	11.8%	1.2%	14.3%	4.4%
% Directional			16.3%			10.8%			52.9%			19.9%	
AM Peak Hour Factor			*0.79*			*0.89*			*0.83*			*0.77*	

Begin Time	End Time	Eastbound (Central Ave.)			Westbound (Central Ave.)			Northbound (98th St.)			Southbound (98th St.)		
		L	T	R	L	T	R	L	T	R	L	T	R
4:00 PM	4:15 PM	~~28~~	~~56~~	~~11~~	~~76~~	~~41~~	~~5~~	~~5~~	~~112~~	~~44~~	~~13~~	~~220~~	~~27~~
4:15 PM	4:30 PM	~~34~~	~~49~~	~~7~~	~~82~~	~~47~~	~~9~~	~~7~~	~~115~~	~~43~~	~~7~~	~~257~~	~~41~~
4:30 PM	4:45 PM	~~28~~	~~45~~	~~16~~	~~96~~	~~56~~	~~9~~	~~9~~	~~100~~	~~51~~	~~19~~	~~213~~	~~48~~
4:45 PM	5:00 PM	**35**	**51**	**19**	**94**	**50**	**7**	**3**	**131**	**41**	**22**	**315**	**33**
5:00 PM	5:15 PM	**69**	**52**	**9**	**98**	**66**	**9**	**7**	**111**	**47**	**21**	**274**	**49**
5:15 PM	5:30 PM	**41**	**37**	**11**	**112**	**63**	**13**	**6**	**131**	**54**	**19**	**307**	**38**
5:30 PM	5:45 PM	**37**	**52**	**12**	**93**	**61**	**11**	**9**	**136**	**43**	**7**	**311**	**36**
5:45 PM	6:00 PM	~~17~~	~~51~~	~~5~~	~~121~~	~~77~~	~~4~~	~~4~~	~~121~~	~~35~~	~~10~~	~~265~~	~~30~~
PM Peak Hour Volumes		**182**	**192**	**51**	**397**	**240**	**40**	**25**	**509**	**185**	**69**	**1207**	**156**
% of Total Traffic		5.6%	5.9%	1.6%	12.2%	7.4%	1.2%	0.8%	15.6%	5.7%	2.1%	37.1%	4.8%
% Directional			13.1%			20.8%			22.1%			44.0%	
PM Peak Hour Factor			*0.82*			*0.90*			*0.94*			*0.97*	

Traffic Count Data Sheet

Year Counts Taken: **2008**

E-W Street **Sunset Gardens Rd**

N-S Street: **98th St**

Speed Limit (Sunset Gardens Rd)= **25** MPH

Speed Limit (98th St)= **25** MPH

Date of Count: **7/29/08**

Begin Time	End Time	Eastbound (Sunset Gardens Rd)			Westbound (Sunset Gardens Rd			Northbound (98th St)			Southbound (98th St)		
		L	T	R	L	T	R	L	T	R	L	T	R
7:00 AM	7:15 AM	**10**	**0**	**2**	**1**	**0**	**15**	**0**	**356**	**1**	**2**	**57**	**3**
7:15 AM	7:30 AM	**6**	**0**	**7**	**4**	**0**	**13**	**1**	**357**	**1**	**2**	**70**	**2**
7:30 AM	7:45 AM	**7**	**0**	**7**	**3**	**0**	**10**	**3**	**394**	**1**	**4**	**68**	**3**
7:45 AM	8:00 AM	**13**	**0**	**6**	**1**	**0**	**4**	**3**	**333**	**2**	**1**	**74**	**3**
8:00 AM	8:15 AM	~~8~~	~~0~~	~~1~~	~~1~~	~~0~~	~~6~~	~~3~~	~~245~~	~~3~~	~~4~~	~~69~~	~~2~~
8:15 AM	8:30 AM	~~9~~	~~0~~	~~3~~	~~0~~	~~0~~	~~3~~	~~1~~	~~236~~	~~0~~	~~2~~	~~88~~	~~3~~
8:30 AM	8:45 AM	~~7~~	~~0~~	~~2~~	~~1~~	~~0~~	~~3~~	~~1~~	~~237~~	~~4~~	~~0~~	~~64~~	~~1~~
8:45 AM	9:00 AM	~~5~~	~~0~~	~~0~~	~~0~~	~~0~~	~~3~~	~~2~~	~~211~~	~~1~~	~~1~~	~~81~~	~~2~~
AM Peak Hour Volumes		**36**	**0**	**22**	**9**	**0**	**42**	**7**	**1440**	**5**	**9**	**269**	**11**
% of Total Traffic		1.9%	0.0%	1.2%	0.5%	0.0%	2.3%	0.4%	77.8%	0.3%	0.5%	14.5%	0.6%
% Directional			3.1%			2.8%			78.5%			15.6%	
AM Peak Hour Factor			***0.76***			***0.75***			***0.91***			***0.93***	

Begin Time	End Time	Eastbound (Sunset Gardens Rd)			Westbound (Sunset Gardens Rd			Northbound (98th St)			Southbound (98th St)		
		L	T	R	L	T	R	L	T	R	L	T	R
4:00 PM	4:15 PM	~~4~~	~~1~~	~~1~~	~~0~~	~~1~~	~~6~~	~~9~~	~~156~~	~~3~~	~~10~~	~~313~~	~~20~~
4:15 PM	4:30 PM	~~14~~	~~1~~	~~3~~	~~0~~	~~3~~	~~3~~	~~8~~	~~157~~	~~2~~	~~6~~	~~324~~	~~16~~
4:30 PM	4:45 PM	~~7~~	~~0~~	~~7~~	~~3~~	~~2~~	~~4~~	~~5~~	~~164~~	~~0~~	~~8~~	~~328~~	~~18~~
4:45 PM	5:00 PM	**9**	**0**	**1**	**8**	**0**	**4**	**3**	**174**	**3**	**13**	**348**	**16**
5:00 PM	5:15 PM	**9**	**0**	**6**	**1**	**1**	**3**	**7**	**187**	**4**	**11**	**346**	**15**
5:15 PM	5:30 PM	**14**	**0**	**3**	**1**	**1**	**2**	**7**	**158**	**5**	**16**	**426**	**27**
5:30 PM	5:45 PM	**8**	**0**	**7**	**3**	**0**	**4**	**4**	**223**	**1**	**13**	**435**	**19**
5:45 PM	6:00 PM	~~4~~	~~0~~	~~8~~	~~2~~	~~1~~	~~3~~	~~6~~	~~172~~	~~3~~	~~10~~	~~350~~	~~13~~
PM Peak Hour Volumes		**40**	**0**	**17**	**13**	**2**	**13**	**21**	**742**	**13**	**53**	**1555**	**77**
% of Total Traffic		1.6%	0.0%	0.7%	0.5%	0.1%	0.5%	0.8%	29.1%	0.5%	2.1%	61.1%	3.0%
% Directional			2.2%			1.1%			30.5%			66.2%	
PM Peak Hour Factor			***0.84***			***0.58***			***0.85***			***0.90***	

Signalized Intersection Information Sheet

Intersection: **Tower / 98th**

Speed Limit - E-W Street: 40 M.P.H.
Speed Limit - N-S Street: 45 M.P.H.
Type of Intersection Control: Signalized

Date:

East Bound Approach: Tower

	Left Turn Lanes	Thru / Lefts	Left/Thru/Right	Thru Lanes	Thru / Rights	Right Turn Lanes
No. Lanes -	1	-	-	1	1	-
Length -	180					0
	Left Turn Arrow?			Thru Green	Right Turn Arrow?	
Permitted ->	NO			YES	NO	

Is there a right turn slip laned that by-passes the traffic signal? NO

West Bound Approach: Tower

	Left Turn Lanes	Thru / Lefts	Left/Thru/Right	Thru Lanes	Thru / Rights	Right Turn Lanes
No. Lanes -	1	-		2	-	1
Length -	190					130
	Left Turn Arrow?			Thru Green	Right Turn Arrow?	
Permitted ->	NO			YES	NO	

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

North Bound Approach: 98th

	Left Turn Lanes	Thru / Lefts	Left/Thru/Right	Thru Lanes	Thru / Rights	Right Turn Lanes
No. Lanes -	1	-		2	-	1
Length -	170					240
	Left Turn Arrow?			Thru Green	Right Turn Arrow?	
Permitted/Protected ->	YES			YES	NO	

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

South Bound Approach: 98th

	Left Turn Lanes	Thru / Lefts	Left/Thru/Right	Thru Lanes	Thru / Rights	Right Turn Lanes
No. Lanes -	1	-		2	-	1
Length -	220					220
	Left Turn Arrow?			Thru Green	Right Turn Arrow?	
Permitted/Protected ->	YES			YES	NO	

Is there a right turn slip laned that by-passes the traffic signal? NO

NOTE: Existing Geometry

Intersection Data Sheet

Intersection: **Central Ave / 98th St**

Posted Speed Limit (E-W Street): 55 EB / 45 WB Date: 8/8/2005

Eastbound Approach: Central Ave

Left Turn Lanes	Thru/Left Lanes	Thru Lanes	Thru/Right Lanes	Right Turn Lanes
1	stripes	2	0	1

Length: 180 feet 145'

Left Turn Arrow?	Thru Green?	Right Turn Arrow?
Y	Y	N

Is there a right turn slip lane that by-passes the traffic signal? **Yes**

Westbound Approach: Central Ave

Left Turn Lanes	Thru/Left Lanes	Thru Lanes	Thru/Right Lanes	Right Turn Lanes
1	stripes	2	0	1

Length: 195 feet 120'

Left Turn Arrow?	Thru Green?	Right Turn Arrow?
Y	Y	N

Is there a right turn slip lane that by-passes the traffic signal? **Yes**

Posted Speed Limit (N-S Street):

Northbound Approach: 98th St

Left Turn Lanes	Thru/Left Lanes	Thru Lanes	Thru/Right Lanes	Right Turn Lanes
1	0	2	0	1

Length: 240 feet 200'

Left Turn Arrow?	Thru Green?	Right Turn Arrow?
Y	Y	N

Is there a right turn slip lane that by-passes the traffic signal? **Yes**

Southbound Approach: 98th St

Left Turn Lanes	Thru/Left Lanes	Thru Lanes	Thru/Right Lanes	Right Turn Lanes
1	0	2	0	1

Length: 190 feet 105'

Left Turn Arrow?	Thru Green?	Right Turn Arrow?
Y	Y	N

Is there a right turn slip lane that by-passes the traffic signal? **Yes**