TRAFFIC IMPACT STUDY **JLM Living Paseo**

Final Report September 2024

Prepared for Cobb Fendley and Associates

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Traffic Impact Study (TIS) JLM Living Paseo

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September 2024

Prepared for: Cobb Fendley and Associates



Prepared By:



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EXECUTIVE SUMMARY

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

BACKGROUND

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

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

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

Study intersections include:

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

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

It should be noted that the extension of Woodmont Avenue will be constructed from Unser Boulevard to the western margin of the proposed site, per the site layout plan. However, the future connection to Universe Boulevard was analyzed for the purpose of this traffic study to evaluate the ultimate roadway configuration. Traffic routing in the interim is shown in Appendix D but is not included in capacity analyses.

Analysis scenarios for this study include:

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



Turning movement counts (TMC) were collected for nine hours on Thursday, May 2nd, 2024, for the intersection of Universe Boulevard and Woodmont Avenue. A 45-hour traffic data was also collected from 2:00 PM on Wednesday, May 1st, 2024, to 11:00 AM on Friday, May 3rd, 2024, for Unser Boulevard near the study area.

These volumes were analyzed unaltered in the Existing scenario of the Level of Service and Queueing Analysis section. Volumes for the proposed driveways were balanced using existing counts from surrounding intersections. Site trips for the proposed development site were generated based on ITE 210 – Single Family Detached. Proposed development-generated trips were used to analyze Build-Out Year 2025 and Horizon Year 2035 Total volumes.

SUMMARY OF TRAFFIC ANALYSIS AND RECOMMENDATIONS

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

Conclusions

Traffic operations for the Existing scenario are summarized as follows:

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

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

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

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

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

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- Unser Boulevard and the extension of Woodmont Avenue
 - EBL movement is expected to operate at LOS E with a V/C ratio of less than 1 during the PM peak hour.
 - All other movements are expected to operate at acceptable LOS.
- The extension of Woodmont Avenue and Driveway 1
 - All movements are expected to operate at LOS B or better.
- Universe Boulevard and Driveway 2
 - All movements are expected to operate at LOS C or better.

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

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

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

- Universe Boulevard and Woodmont Avenue
 - EBL movement and westbound approach are expected to operate below LOS D with V/C ratios of less than 1 during the AM peak hour.
 - EBL movement is expected to operate at LOS F with a V/C ratio greater than 1 and a delay of greater than 16 minutes during the PM peak hour.
 - EBT movement and the westbound approach are expected to operate at LOS F with V/C ratios of less than 1 during the PM peak hour.
 - EBL movement is expected not to accommodate 95th-percentile queue lengths during the PM peak hour.
 - All other storage lengths are expected to be sufficient to accommodate 95th-percentile queue lengths during the AM and PM peak hours.
- Unser Boulevard and the extension of Woodmont Avenue
 - EBL movement is expected to operate at LOS E with a V/C ratio of less than 1 during the PM peak hour.
 - All other movements are expected to operate at acceptable LOS.
- The extension of Woodmont Avenue and Driveway 1
 - All movements are expected to operate at LOS B or better.
- Universe Boulevard and Driveway 2
 - All movements are expected to operate at LOS C or better.



SITE RECOMMENDATIONS

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

- Universe Boulevard and Woodmont Avenue
 - A southbound left-turn deceleration lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of reverse curve is recommended.
- Unser Boulevard and Woodmont Avenue Extension
 - An eastbound left-turn deceleration lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of reverse curve is recommended.
 - A northbound left-turn deceleration lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of the reverse curve is recommended.
 - A southbound right-turn deceleration lane with a minimum storage length of 240 feet and a transition length of 300 feet with 150 feet of reverse curve is recommended.
- Woodmont Avenue Extension and Driveway 1
 - A westbound left-turn lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of the reverse curve is recommended.

OFF-SITE INTERSECTION RECOMMENDATIONS

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

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

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INTRODUCTION

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

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

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

Traffic Analysis

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

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

BACKGROUND INFORMATION

PROJECT LOCATION & SITE PLAN

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

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



The proposed development would convert approximately 18.93 acres of a single vacant parcel into a single-family housing development. Proposed access points include one site driveway (the main access point) on the extension of Woodmont Avenue and one (the secondary access point) to Universe Boulevard through Avenida de Jaimito. Even though ROW is not part of this traffic engineering study, it is noted that the existing right of way from Universe Boulevard to the secondary access point (the western limit of the site) will remain as the City's right of way. For the proposed of this TIS study, the secondary access point was evaluated at Universe Boulevard.



Figure 1: Site Plan

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Figure 2: Vicinity Map

STUDY AREA, AREA LAND USE, AND STREETS NARRATIVE SUMMARY

STUDY AREA

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

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

AREA LAND USE

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

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



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

STREETS

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

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

Woodmont Avenue is a CABQ-maintained, east-west four-lane roadway separated by a raised median near the study area. The roadway is classified by MRMPO 2040 Long Range Roadway System as a minor arterial, and the posted speed limit is 35 MPH within the study area. The roadway has bike lanes on both sides of the roadway, sidewalk on the south side, and a paved multi-use facility path on the north side. Curbs and gutters exist on both sides of the roadway. It should be noted that Woodmont Avenue is planned to be extended to the east with the development of the subject site to intersect Unser Boulevard. Although not specifically Woodmont listed in the RGCGO RACC Inventory, the new extension is located approximately 2,700 feet north of Rosa Parks Avenue and 1,100 feet south of Paseo Del Norte.

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

INTERSECTIONS

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

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

BICYCLE FACILITIES

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

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





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Existing Intersection Lane Configuration Planned Roadways



Figure 3: Existing Lane Configurations and Traffic Control

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DATA COLLECTION

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

FIELD DATA COLLECTION

On-Street Parking

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

Bicycles

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

Transit

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

TRAFFIC SCENARIO DEVELOPMENT

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

It should be noted that the extension of Woodmont Avenue will be constructed from Unser Boulevard to the western margin of the proposed site, per the site layout plan. However, the future connection to Universe Boulevard was analyzed for the purpose of this traffic study to evaluate the ultimate roadway configuration. Traffic routing in the interim is shown in Appendix D but is not included in capacity analyses.

TRAFFIC COUNTS, GROWTH RATES, ADJACENT SITE TRIPS, AND TRIP GENERATIONS TURNING MOVEMENT COUNTS

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

Table 1: Intersection Peak hour

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









Figure 4: Existing Peak Hour Turning Movement Counts



TRAFFIC GROWTH

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

Table 2: Yearly Growth Rates									
Street	Segment Begin	Segment End	Direction	Period	MRCOG 2016 Model "Peak Hour Load"	MRCOG 2040 Model "Peak Hour Load"	Annual Growth Rate	Average Annual Growth	Growth Rate for Analysis
	Volcano Vista High	Woodmont Ave	NB	AM PH	213	281	1.17%		
-	School Driveway	Woodmont Ave	NB	PM PH	584	534	-0.37%		
Ble	Woodmont Ave	Volcano Vista High	SB .	AM PH	555	479	-0.62%		
se	Woodmont Ave	School Driveway	30	PM PH	268	331	0.88%	0.08%	1 00%
ver	Woodmont Ave	Oak Ridge St	NB	AM PH	143	184	1.05%	0.0070	1.00%
in .	Woodmont Ave	Ouk Mage St	NB	PM PH	380	309	-0.86%		
_	Oak Ridge St	Woodmont Ave	SB -	AM PH	367	272	-1.23%	-	
				PM PH	175	202	0.61%		
Rosa Parks Rd Ave De Jaimito	Ave De laimito	NB -	AM PH	373	527	1.45%			
			ND	PM PH	449	485	0.32%		
	Ave De laimito	Rosa Parks Rd	SB -	AM PH	405	468	0.61%		
	Ave be jainito			PM PH	391	544	1.38%		
рл	b	South of Paseo Del	NB	AM PH	373	527	1.45%		
L8	Ave be jainito	Norte	NB	PM PH	449	485	0.32%	0 9/1%	1 00%
Ise	South of Paseo	Ave De laimito	SB	AM PH	405	468	0.61%	0.94%	1.00%
5	Del Norte	Ave be jainito	50	PM PH	391	544	1.38%		
	North of Ave De	Pasao Dal Norta	NR	AM PH	373	527	1.45%		
-	Jaimito	Faseo Del Nolte	ND	PM PH	449	485	0.32%		
	Paseo Del Norte	North of Ave De	SB .	AM PH	405	468	0.61%		
	Paseo Del Nonte	Jaimito	30	PM PH	391	544	1.38%		
	Fast of Linser Blud	Lincer Blvd	\//B	AM PH	658	881	1.22%		
te	Last of offset blvu	Unser bivu	VVD	PM PH	1380	1709	0.89%		
Vor	Linser Blud	Fast of Linser Blud	FR .	AM PH	1239	1596	1.06%		1.50%
el	Olisel bivu		LD	PM PH	813	1118	1.34%	1.17%	
0	Linser Blvd	West of Linser Plud	\\/B	AM PH	698	956	1.32%		
ase	Ulisel bivu	WEST OF OTISET DIVU	VV D	PM PH	1405	1782	1.00%		
Å	West of Unser	Linser Blud	FR	AM PH	1269	1658	1.12%		
	Blvd	Ulisel bivu	LD	PM PH	851	1191	1.41%		

Source: MRCOG 2040 Trends

ADJACENT SITE TRIPS

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

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

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

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

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

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

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

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

Qualified adjacent development site trips were distributed to and from intersections. A map showing the adjacent and proposed developments is provided in Figure 5. Figure 6 provides a composite of the site-generated trips from the three projects to be included as part of the 2025 and 2035 Background conditions.





Figure 5: Adjacent Development Map









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



SITE TRIP GENERATION

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

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

TRIP DISTRIBUTION AND ASSIGNMENT

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

It should be noted that the extension of Woodmont Avenue will be constructed from Unser Boulevard to the western margin of the proposed site, per the site layout plan. However, the future connection to Universe Boulevard was analyzed for the purpose of this traffic study to evaluate the ultimate roadway configuration. Traffic routing in the interim is shown in Appendix D but is not included in capacity analyses.

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

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



Figure 8: Site Generated Trips Build-Out Year 2025



TRAFFIC VOLUME CALCULATIONS

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

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

Figure 9 shows the assumed lane configurations and traffic control for Build-Out and Horizon Year scenarios. Figures 10 through 13 show the volumes for each Build-Out and Horizon Year scenario under the ultimate roadway configuration. Traffic volumes in the interim for Build-Out and Horizon Year Total conditions were also shown in Appendix D.





- $\hat{\mathbf{T}}$ Assumed Intersection Lane Configuration
- וֹל New (2035) Movements



Figure 9: Assumed Lane Configurations and Traffic Control





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



Figure 10: Build-Out Year 2025 Background Volumes









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





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



Figure 12: Horizon Year 2035 Background Volumes





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



Figure 13: Horizon Year 2035 Full-Build Volume



SITE CONDITIONS AND SITE ANALYSIS

Assumptions

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

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

SITE ACCESS ANALYSIS

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

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

Table 4: Access Spacing Requirements from CABQ DPM

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

AUXILIARY LANE ANALYSIS

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

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

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

Table 5: Auxiliary Lane Warrants

Notes:

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

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

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



- A southbound right-turn deceleration lane with a minimum storage length of 240 feet and a transition length of 300 feet with 150 feet of reverse curve because the PM peakhour turning volume is just one vehicle less than the CABQ turn lane threshold. Additionally, Unser Boulevard is classified as a regional principal arterial, which is typically considered as a high-traffic volume roadway.
- A northbound left-turn deceleration lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of the reverse curve. The presence of a raised median on Unser Boulevard, the roadway classification, and the site plan indicated that a left-turn lane should be provided to accommodate future traffic entering the extension of Woodmont Avenue.
- Woodmont Avenue Extension and Driveway 1
 - A westbound left-turn deceleration lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of reverse curve.

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

INTERSECTION SIGHT DISTANCE

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

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

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

Access Location	Posted Speed Limit (MPH)	Assumed Cross-Section	Case	Required Sight Distance (FT)
Extension of Woodmont Avenue	25	2 Lano Undividad	B1	390
& Driveway 1	55	2 Lane Onumueu	B2	340
Universe Deuleverd & Drivever 2	25		B1	390
Universe Boulevard & Driveway 2	35	z Lane Undivided	B2	340
Unser Boulevard & Extension of	25	4 Lane Divided with	B1	465
Woodmont Avenue	55	14 feet Median	B2	335

Table 6: Required Sight Distance Values



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

SITE ACCESS RECOMMENDATION

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

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

TRAFFIC ANALYSIS

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

LOS, CAPACITY, AND QUEUING ANALYSIS

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

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



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

Table 7: LOS Criteria and Descriptions for Signalized Intersections

Table 8: LOS Criter	ia for Unsignalized Intersections
Level of	Average Control Delay
service	(sec/vehicle)
A	≤10
В	>10-15
С	>15 – 25
D	>25 – 35
E	>35 – 50
F	>50

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

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

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

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

EXISTING YEAR 2024 CONDITIONS

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

Delay and LOS Results

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



Queuing Results

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

	Universe Blvd. & Woodmont Ave. (Stop-Controlled)																
	Movement	95% Queue	Auxiliary	v/c	Delay	1.05	Intersection	n Intersection LOS	ak	Movement	95% Queue	Auxiliary	v/c	Delay	LOS	Intersection	Intersection
¥		Length (ft/lane)	Lane Length		(s/veh)	100	Delay				Length (ft/lane)	Lane Length	.,.	(s/veh)		Delay	LOS
l Pe	EBL	<50	-	0.27	22.8	С	3.6	-	- PM Pe	EBL	185		0.98	125.2	F		
AN	EBR	<50	-	0.29	15.5	С				PZ	EBR	<50	-	0.19	12.1	В	14.5
	NBL	<50	300	0.04	9.0	А				NBL	<50	300	0.12	8.8	Α		

Table 9: Intersection Capacity A	Analysis Summary for	Existing (2024) Conditions
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BUILD-OUT YEAR (2025) BACKGROUND CONDITIONS

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

Delay and LOS Results

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

Queuing Results

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

	Universe Blvd. & Woodmont Ave. (Stop-Controlled)																
ak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	v/c	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	ak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	v/c	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS
I Pe	EBL	<50	-	0.33	28.8	D	3.8		Pe	EBL	257		1.31	255.5	F		
AN	EBR	<50	-	0.32	16.9	С		-	Σ	EBR	<50		0.22	13.3	В	25.3	-
	NBL	<50	300	0.05	9.3	А				NBL	<50	300	0.13	9.2	А		

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

BUILD-OUT YEAR (2025) FULL-BUILD CONDITIONS

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

Delay and LOS Results

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

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



- EBL movement is expected to operate at LOS F with a V/C ratio of greater than 1 and a delay of 566.7 seconds during the PM peak hour.
- EBT movement and the westbound approach are expected to operate below LOS D with V/C ratios of less than 1 during the PM peak hour.
- At the stop-controlled intersection of Unser Boulevard and the extension of Woodmont Avenue
 - EBL movement is expected to operate at LOS E with a V/C ratio of less than 1 during the PM peak hour.

Queuing Results

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

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

					U U	Jniv	erse Blvd.	& Woodmo	ont	Ave. (Stop	-Controlled)							
	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	v/c	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS		Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	v/c	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	
	EBL	50	180	0.44	41.9	Е				EBL	345	180	1.97	566.7	F			
e al	EBT	<50	-	0.01	23.1	С			eak	EBT	<50		0.09	44.1	Е			
Σ	EBR	<50	-	0.31	16.3	С	5 1		Σ	EBR	<50	-	0.21	12.7	В	52.2		
◄	WBR/T/L	<50	-	0.19	25.9	D	5.1	-	•	WBR/T/L	<50		0.30	50.9	F	52.2	-	
	NBL	<50	300	0.05	9.3	А				NBL	<50	300	0.13	9.2	Α			
	SBL	<50	265	0.01	8.0	А				SBL	<50	265	0.03	9.2	Α			
					Unsei	r Blv	d. & Exten	sion of Wo	odr	nont Ave.	(Stop-Controll	ed)						
×	Movement	95% Queue	Auxiliary	v/c	Delay	LOS	Intersection	Intersection	¥	Movement	95% Queue	Auxiliary	v/c	Delay (s/yeb)	LOS	Intersection	Intersection	
Pea	EBL	<50	265	0.26	33.2	D	Delay	Peal	Pea	EBL	<50	265	0.26	46.5	Е	Delay	-	
Ā	EBR	<50		0.07	13.1	В	1.4		Σ	EBR	<50		0.05	13.6	в	1.2		
	NBL	<50	265	0.01	8.9	А				NBL	<50	265	0.04	9.4	A			
	Extension of Woodmont Ave. & Driveway 1											(Stop-Controlled)						
ak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	v/c	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	¥	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	v/c	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	
IPe	NBL	<50	-	0.04	9.0	А				Pe	NBL	<50	-	0.04	10.1	В		
AZ	NBR	<50	-	0.07	8.6	А	7.7	-	Σ	NBR	<50	-	0.05	8.6	Α	6.5	-	
	WBL	<50	265	0.02	7.3	А				WBL	<50	265	0.06	7.4	Α			
						U	niverse Blv	d. & Drivev	vay	2 (Stop-Co	ontrolled)							
eak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	v/c	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	eak	Movement	95% Queue Length (ft/lane)	Auxiliary Lane Length	v/c	Delay (s/veh)	LOS	Intersection Delay	Intersection LOS	
Σ	WBL/R	<50	-	0.04	17.0	С	0.2		Σ	WBL/R	<50	-	0.03	19.0	С	0.2		
A	SBL	<50	-	0.0	8.1	А	0.2	-	4	SBL	<50	-	0.01	9.1	А	0.2	-	

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

HORIZON YEAR (2035) BACKGROUND CONDITIONS

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

Delay and LOS Results

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


Queuing Results

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

						Jniv	erse Blvd.	& Woodmo	ont	Ave. (Stop	-Controlled)						
	Movement	95% Queue	Auxiliary	v/c	Delay	105	Intersection	Intersection		Movement	95% Queue	Auxiliary	v/c	Delay	105	Intersection	Intersection
	wovement	Length (ft/lane)	Lane Length	v/C	(s/veh)	103	Delay	LOS		wovement	Length (ft/lane)	Lane Length	v/c	(s/veh)	103	Delay	LOS
	EBL	75	180	0.58	58.5	F				EBL	438	180	2.54	825.2	F		
dead	EBT	<50	-	0.00	0.0	Α			eak	EBT	<50	-	0.00	0.0	А		
Σ	EBR	50	-	0.41	19.9	С	F 0		Σ	EBR	<50	-	0.26	13.8	В	70.0	
V	WBR/T/L	<50	-	0.00	0.0	Α	5.9	-	•	WBR/T/L	<50	-	0.00	0.0	А	/8.8	-
	NBL	<50	300	0.06	9.7	А]			NBL	<50	300	0.16	9.6	А		
	SBL	<50	265	0.00	0.0	А]			SBL	<50	265	0.00	0.0	Α		

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

HORIZON YEAR (2035) TOTAL CONDITIONS

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

Delay and LOS Results

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

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

Queuing Results

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

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



					ι	Jniv	erse Blvd.	& Woodmo	ont	Ave. (Stop	-Controlled)						
	Movement	95% Queue	Auxiliary	v/c	Delay	105	Intersection	Intersection		Movement	95% Queue	Auxiliary	v/c	Delay	105	Intersection	Intersection
	Movement	Length (ft/lane)	Lane Length	•/~	(s/veh)	2005	Delay	LOS			Length (ft/lane)	Lane Length	•/~	(s/veh)	2005	Delay	LOS
<u> </u>	EBL	90	180	0.66	74.9	F			Ų	EBL	485	180	3.41	>1000	F		
Pea	EBT	<50	-	0.01	27.7	D			eal	EBT	<50	-	0.13	62.1	F		
Σ	EBR	50	-	0.41	19.9	С	7.0		Ξ	EBR	<50	-	0.26	13.9	В	114	
•	WBR/T/L	<50		0.26	37.8	Е	7.0	-	~	WBR/T/L	<50		0.45	89.0	F	114	-
	NBL	<50	300	0.06	9.7	А				NBL	<50	300	0.17	9.7	А		
	SBL	<50	265	0.01	8.1	А				SBL	<50	265	0.03	9.6	А		
					Unsei	r Blv	d. & Exten	sion of Wo	odı	mont Ave.	(Stop-Controll	ed)					
		95% Queue	Auxiliary	11/0	Delay		Intersection	Intersection			95% Queue	Auxiliary	140	Delay		Intersection	Intersection
¥	iviovement	Length (ft/lane)	Lane Length	v/c	(s/veh)	LOS	Delay	LOS	¥	wovement	Length (ft/lane)	Lane Length	v/C	(s/veh)	LOS	Delay	LOS
IPe	EBL	<50	265	0.23	29.6	D			Pe	EBL	<50	265	0.22	38.8	Е		
AP	EBR	<50	-	0.05	11.0	В	1.1	-	≧	EBR	<50	-	0.40	11.2	В	0.9	-
	NBL	<50	265	0.01	9.3	А				NBL	<50	265	0.05	9.8	А		
					Exten	sion	of Woodr	nont Ave. 8	δD	riveway 1	Stop-Controll	ed)					
	Movement	95% Queue	Auxiliary	v/c	Delay	105	Intersection	Intersection		Movement	95% Queue	Auxiliary	v/c	Delay	105	Intersection	Intersection
eak	Movement	Length (ft/lane)	Lane Length	•/ C	(s/veh)	200	Delay	LOS	eak		Length (ft/lane)	Lane Length	v/c	(s/veh)	103	Delay	LOS
4 P	NBL	<50	-	0.04	9.0	Α			٩,	NBL	<50	-	0.04	10.1	В		
A	NBR	<50	-	0.07	8.6	Α	7.7	-	E	NBR	<50	-	0.05	8.6	Α	6.5	-
	WBL	<50	265	0.02	7.3	А				WBL	<50	265	0.06	7.4	А		
						U	niverse Blv	d. & Drivev	vay	2 (Stop-Co	ontrolled)					-	-
¥	Movement	95% Queue	Auxiliary	v/c	Delay	LOS	Intersection	Intersection	¥	Movement	95% Queue	Auxiliary	v/c	Delay	LOS	Intersection	Intersection
Pea		Length (ft/lane)	Lane Length	-,-	(s/veh)		Delay	LOS	Pea		Length (ft/lane)	Lane Length	-,-	(s/veh)		Delay	LOS
δ	WBL/R	<50	-	0.05	19.8	С	0.2	-	Σ	WBL/R	<50	-	0.04	22.4	С	0.2	-
	SBL	<50	-	0.0	8.2	Α			-	SBL	<50	-	0.01	9.5	Α	0.2	

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

CAPACITY MITIGATIONS

UNIVERSE BOULEVARD AND WOODMONT AVENUE MITIGATIONS

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

Delay and LOS Results

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

Queuing Results

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

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

Table 14: Universe Boulevard and Woodmont Avenue Summary with Mitigations



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

2025 n	2025 non-site Site Site							
Peak-Hou	r Volumes	Peak-Hou	Peak-Hour Volumes Peak-Hour Volumes					
AM	PM	AM	PM	AM	PM			
1,199	1,298	1,373	1,488	57	78			
				Percentages	of Contribution			
				AM	PM			
Percent	ages of 2025 S	ite Traffic Cor	ntribution	4.54%	5.67%			
Percent	Percentages of 2035 Site Traffic Contribution 3.99% 4.98%							
Averaged Percentages of Site Traffic Contribution 4.79%								

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

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

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

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

CRASH DATA SUMMARY

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

From the table below, the following observations are made:

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

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



	Crash Summary	Universe Blvd. & Woodmont Ave.	Unser Blvd. & Ave De Jaimito
	Total Crashes	3	2
	2018	1	0
ar	2019	1	0
Ye	2020	0	1
	2021	1	1
	2022	0	0
	Left Blank	1	2
	Fixed Object	0	0
	Collision With Animal	0	0
be	Other Vehicle - From Opposite Direction/Sideswipe Collision	0	0
Τy	Other Vehicle - From Same Direction/One Left Turn	0	0
hsh	Other Vehicle - From Same Direction/Rear End Collision	0	0
Cre	Other Vehicle - From Same Direction/Sideswipe Collision	1	0
	Other Vehicle - From Same Direction/Vehicle Backing	0	0
	Other Venicle - One Left Turn/Entering At Angle	1	0
	%Other Venicle - One Left Turn/Entering At Angle	33%	0%
	%Left Blank	33%	100%
J US	Daylight	3	2
itin(Dark-Lighted	0	0
-igh ond	Dark-Not Lighted	100%	100%
- ŭ	%Daylight %Dark-Not Lighted	100%	100%
	Eatal Crash (K)	0/0	0/0
	Fatal Clash (N) Suspected Serious Injuny (A)	0	0
≥	Suspected Minor Injury (B)	2	1
'erit	Complaint of Injury (C)	1	1
Sev	Property Damage Only Crash (D)	0	0
•••	%Injury Crash	100%	100%
	%Property Damage Only Crash	0%	0%
±	Pedestrian Involved	0	0
bed	Pedalcycle Involved	0	0
ke/ł olve	%Pedestrian Involved	0%	0%
Bi Inv	%Pedalcycle Involved	0%	0%
	Under The Influence	1	0
	Failed To Vield	2	0
ors	Driver Instremtion	1	2
acte	Following Too Closely	0	1
а Ц	None	2	0
utinç	Other Mechanical Defect	- 1	0
ribu	Other	1	2
ont	%Failed To Vield	67%	0%
0	%Driver Inattention	33%	100%
	%None	67%	0%

Table 16: Crash Summary

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CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Traffic operations for the Existing scenario are summarized as follows:

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

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

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

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

- Universe Boulevard and Woodmont Avenue
 - EBL movement is expected to operate at LOS E with a V/C ratio of less than 1 during the AM peak hour.
 - EBL movement is expected to operate at LOS F with a V/C ratio of greater than 1 and a delay of 566.7 seconds during the PM peak hour.
 - EBT movement and the westbound approach are expected to operate below LOS D with V/C ratios of less than 1 during the PM peak hour.
 - All other movements are expected to operate at acceptable LOS.
 - EBL movement is expected not to accommodate 95th-percentile queue lengths during the PM peak hour.
 - All other storage lengths are sufficient to accommodate 95th-percentile queue lengths during the AM and PM peak hours.
- Unser Boulevard and the extension of Woodmont Avenue
 - EBL movement is expected to operate at LOS E with a V/C ratio of less than 1 during the PM peak hour.
 - All other movements are expected to operate at acceptable LOS.
- The extension of Woodmont Avenue and Driveway 1
 - All movements are expected to operate at LOS B or better.
- Universe Boulevard and Driveway 2
 - All movements are expected to operate at LOS C or better.

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



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

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

- Universe Boulevard and Woodmont Avenue
 - EBL movement and westbound approach are expected to operate below LOS D with V/C ratios of less than 1 during the AM peak hour.
 - EBL movement is expected to operate at LOS F with a V/C ratio greater than 1 and a delay of greater than 16 minutes during the PM peak hour.
 - EBT movement and the westbound approach are expected to operate at LOS F with V/C ratios of less than 1 during the PM peak hour.
 - EBL movement is expected not to accommodate 95th-percentile queue lengths during the PM peak hour.
 - All other storage lengths are expected to be sufficient to accommodate 95th-percentile queue lengths during the AM and PM peak hours.
- Unser Boulevard and the extension of Woodmont Avenue
 - EBL movement is expected to operate at LOS E with a V/C ratio of less than 1 during the PM peak hour.
 - All other movements are expected to operate at acceptable LOS.
- The extension of Woodmont Avenue and Driveway 1
 - All movements are expected to operate at LOS B or better.
- Universe Boulevard and Driveway 2
 - All movements are expected to operate at LOS C or better.

SITE RECOMMENDATIONS

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

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

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- A southbound right-turn deceleration lane with a minimum storage length of 240 feet and a transition length of 300 feet with 150 feet of reverse curve is recommended.
- Woodmont Avenue Extension and Driveway 1
 - A westbound left-turn lane with a minimum storage length of 115 feet and a transition length of 300 feet with 150 feet of the reverse curve is recommended.

OFF-SITE INTERSECTION RECOMMENDATIONS

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

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



APPENDIX A Scoping Meeting Notes



ARIZONA NEW MEXICO OKLAHOMA TEXAS

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

Attendees: Curtis Cherne – City of Albuquerque Matt Grush – City of Albuquerque

Jonathon Kruse – Lee Engineering Brad Sumrall – Cobb Fendley Rembrandt Fernandez – Cobb Fendley

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

		JLM L	All Units					
	Land U	lse: (#220) I	Multifamily	Housing (Lov	v-Rise)		# of Trips Equation	
# of Units	Da	aily	AM Peak	Roadway	PM Peak	Roadway	Daily 1582.0 T = 6.41 (X) +75.31	
235	Enter	Exit	Enter	Exit	Enter	Exit	AM Pk 96.0 T = 0.31 (X) + 22.85	
Dir. Dist.	50%	50%	24%	76%	63%	37%	PM Pk 122.0 T = 0.43 (X) + 20.55	
Tring	791	791	23	73	77	45	Source: ITE Trip Generation, 11th Edition	
Trips 1582		82	9	6	12	22		
		JLM L	iving - Resid	ential		All Units		
Land Use: (#2			10) Single Fa	mily Detach	ed	# of Tring Equation		
	Ld	na ose: (#z.	ro, single re	,	cu		# OF THESE Equation	
# of Units	Da	nd Ose: (#2 aily	AM Peak	Roadway	PM Peak	Roadway	Daily 2216.0 Ln (T) = 0.92 Ln (X) + 2.68	
# of Units 235	Da Enter	aily Exit	AM Peak Enter	Roadway Exit	PM Peak Enter	Roadway Exit	Daily 2216.0 Ln (T) = 0.92 Ln (X) + 2.68 AM Pk 162.0 Ln (T) = 0.91 Ln (X) + 0.12	
# of Units 235 Dir. Dist.	Enter 50%	aily Exit	AM Peak Enter 26%	Roadway Exit 74%	PM Peak Enter 63%	Roadway Exit 37%	Daily 2216.0 Ln (T) = 0.92 Ln (X) + 2.68 AM Pk 162.0 Ln (T) = 0.91 Ln (X) + 0.12 PM Pk 222.0 Ln (T) = 0.94 Ln (X) + 0.27	
# of Units 235 Dir. Dist.	Enter 50% 1108	Exit 50% 1108	AM Peak Enter 26% 42	Roadway Exit 74% 120	PM Peak Enter 63% 140	Roadway Exit 37% 82	Daily 2216.0 Ln (T) = 0.92 Ln (X) + 2.68 AM Pk 162.0 Ln (T) = 0.91 Ln (X) + 0.12 PM Pk 222.0 Ln (T) = 0.94 Ln (X) + 0.27 Source: ITE Trip Generation, 11th Edition	

- ii. No Pass-by/Diverted trips
- iii. No Internal Capture
- iv. Trips distributed based on existing traffic patterns
- d. Known Developments or Pending Improvements in Area
 - i. Paseo / Unser Project

ii. Developments south side of paseo near Ventana Ranch. Matt to send reports.

- e. Build-out Year and Growth Rate
 - i. Build-Out Year (2025)
 - Will look at Historic Traffic Volumes and calculate growth rate, if less than 1%, will assume 1% growth per year.
- f. Analysis scenarios
 - i. Existing Conditions
 - ii. Opening Year Background (No Build)
 - iii. Opening Year Buildout (Full Build)
 - iv. Opening Year Buildout Optimized (if needed)
 - 1. All scenarios with existing signal timings except opening year buildout optimized.
 - v. Horizon year 10 Years from opening (2035)
 - 1. Work with MRCOG to add Woodmont Link
- g. Required Analysis & Methodology
 - i. LOS Capacity and Queueing analysis based on HCM 6th Edition (Using Synchro)
 - 1. Capacity & Queueing for network peak rather than individual intersection peaks
 - ii. No Arterial Analysis.
 - iii. Auxiliary Lane Analysis
 - iv. Sight Distance Analysis at Proposed Driveways
 - v. Safety (Crash) Summary for the most recent available 5-year period
- 4. Agency Input (Comments & Issues)
- 5. Meeting Notes (distributed by Lee Engineering)

APPENDIX B TURNING MOVEMENT COUNTS

TOTAL

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

			D	icyci	eiu		S IVIC	ven	ients)			
			Southbound	D 1-1-1		Westbound	B ¹ -1-1		Northbound	D '-1-1		Eastbound	B ¹ -1-4
Date	Time	Left Turns	Straight	Right Turns	Left Turns	Straight	Right	Left Turns	Straight	Right Turns	Left Turns	Straight	Right Turns
05/2/2024	0:00	0	0	0	0	0	0	0	0	0	0	0	0
	0:15	0	0	0	0	0	0	0	0	0	0	0	0
	0:30	0	0	0	0	0	0	0	0	0	0	0	0
	0:45	0	0	0	0	0	0	0	0	0	0	0	0
	1:00	0	0	0	0	0	0	0	0	0	0	0	0
	1:30	0	0	0	o	0	o	0	0	0	0	0	0
	1:45	0	0	0	0	0	0	0	0	0	0	0	0
	2:00	0	0	0	0	0	0	0	0	0	0	0	0
	2:15	0	0	0	0	0	0	0	0	0	0	0	0
	2:30	0	0	0	0	0	0	0	0	0	0	0	0
-	3:00	0	0	0	0	0	0	0	0	0	0	0	0
	3:15	0	0	0	0	0	0	0	0	0	0	0	0
	3:30	0	0	0	0	0	0	0	0	0	0	0	0
-	3:45	0	0	0	0	0	0	0	0	0	0	0	0
	4:00	0	0	0	0	0	0	0	0	0	0	0	0
	4:30	0	0	0	o	0	o	0	0	0	0	0	0
	4:45	0	0	0	0	0	0	0	0	0	0	0	0
	5:00	0	0	0	0	0	0	0	0	0	0	0	0
	5:15	0	0	0	0	0	0	0	0	0	0	0	0
	5:30	0	0	0	0	0	0	0	0	0	0	0	0
-	5.45	0	0	0	0	0	0	0	0	0	0	0	0
	6:15	0	0	0	0	0	0	0	0	0	0	0	0
	6:30	0	0	0	0	0	0	0	0	0	0	0	0
	6:45	0	0	0	0	0	0	0	0	0	0	0	0
	7:00	0	0	0	0	0	0	0	0	0	0	0	0
	7:15	0	0	0	0	0	0	0	0	0	0	0	0
	7:45	0	0	0	0	0	0	0	0	0	0	0	0
-	8:00	0	0	0	ō	0	0	0	0	0	0	0	ō
	8:15	0	0	0	0	0	0	0	0	0	0	0	0
	8:30	0	0	0	0	0	0	0	0	0	0	0	0
-	8:45	0	0	0	0	0	0	0	0	0	0	0	0
	9:00	0	0	0	0	0	0	0	0	0	0	0	0
	9:30	0	0	0	o	0	o	0	0	0	0	0	0
	9:45	0	0	0	0	0	0	0	0	0	0	0	0
-	10:00	0	0	0	0	0	0	0	0	0	0	0	0
	10:15	0	0	0	0	0	0	0	0	0	0	0	0
	10:30	0	0	0	0	0	0	0	0	0	0	0	0
	10:45	0	0	0	0	0	0	0	0	0	0	0	0
	11:15	0	0	0	o	0	0	0	0	o	0	0	0
	11:30	0	0	0	0	0	0	0	0	0	0	0	0
	11:45	0	0	0	0	0	0	0	0	0	0	0	0
	12:00	0	0	0	0	0	0	0	0	0	0	0	0
	12:15	0	0	0	0	0	0	0	0	0	0	0	0
	12:45	0	0	0	0	0	0	0	0	0	0	0	0
-	13:00	0	0	0	0	0	0	0	0	0	0	0	0
	13:15	0	0	0	0	0	0	0	0	0	0	0	0
	13:30	0	0	0	0	0	0	0	0	0	0	0	0
	13:45	0	0	0	0	0	0	0	0	0	0	0	0
	14:00	0	0	0	0	0	0	0	0	0	0	0	0
	14:30	0	0	0	0	0	0	0	0	0	0	0	0
	14:45	0	0	0	0	0	0	0	0	0	0	0	0
	15:00	0	0	0	0	0	0	0	0	0	0	0	0
	15:15	0	0	0	0	0	0	0	0	0	0	0	0
	15:45	0	0	0	0	0	0	0	0	0	0	0	0
-	16:00	0	0	0	0	0	0	0	0	0	0	0	0
	16:15	0	0	0	0	0	0	0	0	0	0	0	0
	16:30	0	0	0	0	0	0	0	0	0	0	0	0
•	15:45	0	1	U N	0	U n	U	0	0	U n	0	U n	U n
	17:15	0	0	0	0	0	0	0	0	0	0	0	0
	17:30	0	0	0	0	0	0	0	0	0	0	0	0
	17:45	0	0	0	0	0	0	0	0	0	0	0	0
	18:00	0	0	0	0	0	0	0	0	0	0	0	0
	18:15	0	0	U C	0	U C	0	0	U C	U C	0	U C	0
	18:45	0	0	0	0	0	0	0	0	0	0	0	0
	19:00	0	0	0	0	0	0	0	0	0	0	0	0
	19:15	0	0	0	0	0	0	0	0	0	0	0	0
	19:30	0	0	0	0	0	0	0	0	0	0	0	0
.	19:45	0	0	0	0	0	0	0	0	0	0	0	0
	20:00	0	U O	0	0	0	U O	0	0	U D	0	0	U n
	20:30	0	0	0	0	0	0	0	0	0	0	0	0
	20:45	0	0	0	0	0	0	0	0	0	0	0	0
	21:00	0	0	0	0	0	0	0	0	0	0	0	0
	21:15	0	0	0	0	0	0	0	0	0	0	0	0
	21:30	0	0	0	0	0	0	0	0	0	0	0	0
· ·	22:00	0	0	0	0	0	0	0	0	0	0	0	0
	22:15	0	0	0	0	0	0	0	0	0	0	0	0
	22:30	0	0	0	0	0	0	0	0	0	0	0	0
	22:45	0	0	0	0	0	0	0	0	0	0	0	0
	23:00	0	0	0	0	0	0	0	0	0	0	0	0
	23:15	0	0	U C	0	U C	0	0	U C	U C	0	U C	0
	23:45	0	0	0	0	0	0	0	0	0	0	0	0

Bicycle Turning Movements

5/1/2024 13:45	America/Denver
5/3/2024 11:20	America/Denver
45	hours
28602	
https://www.google.co	m/maps/search/?api=1&query=35.178672667,-106.721603&z=15
23	
42	
40	
47	
43	
41	
45	
	5/1/2024 13:45 5/3/2024 11:20 45 28602 https://www.google.co 23 42 40 47 43 41 45

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

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

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

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

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

APPENDIX C ITE TRIP GENERATION

Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 174

Avg. Num. of Dwelling Units: 246

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

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

Data Plot and Equation



Single-Family Detached Housing (210)

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

Vehicle Trip Generation per Dwelling Unit

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

Data Plot and Equation





Single-Family Detached Housing (210)

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

Vehicle Trip Generation per Dwelling Unit

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

Data Plot and Equation



APPENDIX D

Traffic Volumes for the Interim Roadway Configuration



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

Interim Plan Roadways



Site Generated Trips Build-Out Year 2025 (Interim Roadway Configuration)



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

Interim Plan Roadways



Build-Out Year 2025 Full-Build Volumes (Interim Roadway Configuration)





Interim Plan Roadways



Horizon Year 2035 Full-Build Volume (Interim Roadway Configuration)

APPENDIX E CABQ DPM AND AASHTO GREEN BOOK INTERSECTION SIGHT DISTANCE CALCULATIONS



FIGURE 7.4.93 Intersection Sight Distance

TABLE 7.4	4.65 Minin	num Intei	rsection Sig	ht Distanc	е	
Speed	Minimun	n Intersecti	ion Sight Dist	ance		
Limit (MPH)	2 Lane Ur	ndivided	3 Lane Undi Lane Divide Median	vided or 2 d w/ 12 ft.	4 Lane U	ndivided
	Left Turn	Right Turn	Left Turn	Right Turn	Left Turn	Right Turn
20	230 ft.	200 ft.	240 ft.	200 ft.	250 ft.	200 ft.
25	280 ft.	240 ft.	300 ft.	240 ft.	320 ft.	240 ft.
30	340 ft.	290 ft.	360 ft.	290 ft.	380 ft.	290 ft.
35	390 ft.	340 ft.	420 ft.	340 ft.	440 ft.	340 ft.
40	450 ft.	390 ft.	480 ft.	390 ft.	500 ft.	390 ft.
45	500 ft.	430 ft.	530 ft.	430 ft.	570 ft.	430 ft.
50	560 ft.	480 ft.	590 ft.	480 ft.	630 ft.	480 ft.

Unser Boulevard & Extension of Woodmont Avenue

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

t, Valu	es		
1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 -	Passenger	Single-Unit	Combination
CASE	Car	Truck	Truck
B1 Left Turn from the Minor Road	7.5	9.5	11.5
B2 Right Turn from the Minor Road	65	85	10.5
B3 Crossing Maneuver from the Minor Road			
F Left Turn from the Major Road	5.5	0.5	7.5
For left turns onto two-way highways with more than +0.5 seconds for passenger cars +0.7 seconds for trucks for each additional lane, from the left, in excess of on For minor road approach grades: +0.2 seconds for each percent grade if the approach grade is an upgrade that exceeds 3 per	2 lanes: e, to be crosse cent.	ed by the turnir	ng vehicle.
median and grades 3 percent or less For crossing a major road with more than 2 lanes:			<u>ginii,</u> mu <u>n</u>
+0.5 seconds for passenger cars			
+0.5 seconds for passenger cars +0.7 seconds for trucks			
+0.5 seconds for passenger cars +0.7 seconds for trucks for each additional lane to be crossed and narrow med	lians that can	not store the de	sign vehicle.
+0.5 seconds for passenger cars +0.7 seconds for trucks for each additional lane to be crossed and narrow med For minor road approach grades: +0.1 seconds for each percent grade	lians that can	not store the de	sign vehicle.
+0.5 seconds for passenger cars +0.7 seconds for trucks for each additional lane to be crossed and narrow med For minor road approach grades: +0.1 seconds for each percent grade if the approach grade is an upgrade that exceeds 3 per	lians that can cent.	not store the de	sign vehicle.
H0.5 seconds for passenger cars H0.7 seconds for trucks for each additional lane to be crossed and narrow med For minor road approach grades: H0.1 seconds for each percent grade if the approach grade is an upgrade that exceeds 3 per CASE F - For a stopped vehicle to turn across <u>one</u>	lians that can cent. lane of oppo	not store the de sing traffic	sign vehicle.
+0.5 seconds for passenger cars +0.7 seconds for trucks for each additional lane to be crossed and narrow med For minor road approach grades: +0.1 seconds for each percent grade if the approach grade is an upgrade that exceeds 3 per CASE F - For a stopped vehicle to turn across <u>one</u> For left-turning vehicles that cross more than 1 oppos	ians that can cent. lane of oppo ing lane:	not store the de	sign vehicle.
+0.5 seconds for passenger cars +0.7 seconds for trucks for each additional lane to be crossed and narrow med For minor road approach grades: +0.1 seconds for each percent grade if the approach grade is an upgrade that exceeds 3 per CASE F - For a stopped vehicle to turn across <u>one</u> For left-turning vehicles that cross more than 1 oppos +0.5 seconds for passenger cars	tians that cann cent. lane of oppo ing lane:	not store the de ssing traffic	sign vehicle.
 +0.5 seconds for passenger cars +0.7 seconds for trucks for each additional lane to be crossed and narrow med For minor road approach grades: +0.1 seconds for each percent grade if the approach grade is an upgrade that exceeds 3 per CASE F - For a stopped vehicle to turn across one For left-turning vehicles that cross more than 1 oppos +0.5 seconds for passenger cars +0.7 seconds for passenger cars +0.7 seconds for passenger cars 	tians that cann cent. lane of oppo ing lane:	not store the de	sign vehicle.

Unser Boulevard & Extension of Woodmont Avenue

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

	t, Value	es		
	CASE	Passenger	Single-Unit	Combination Truck
B1	Left Turn from the Minor Road	7.5	9.5	11.5
B2	Right Turn from the Minor Road			10.5
B3	Crossing Maneuver from the Minor Road	0.5	8.5	10.5
F	Left Turn from the Major Road	5.5	6.5	7,5
For left ti +(+(for each a	rms onto two-way highways with more than .5 seconds for passenger cars .7 seconds for trucks idditional lane, from the left, in excess of one	2 lanes: e, to be crosse	d by the turnir	ng vehicle.
if the app CASE B	r road approach grades: 1.2 seconds for each percent grade roach grade is an upgrade that exceeds 3 perc 2 + B3 - For a stopped vehicle to turn righ ud grades 3 percent or less	cent. It onto or cre	oss a <u>2-lane hi</u>	<u>ghway</u> with <u>n</u>
CASE B: rot ninio CASE B: median a For cross +(+(for each a For mino +(if the app	r road approach grades:) 2 seconds for each percent grade roach grade is an upgrade that exceeds 3 percent and grades 3 percent or less ing a major road with more than 2 lanes:) 5 seconds for passenger cars) 7 seconds for trucks idditional lane to be crossed and narrow med rroad approach grades:) 1 seconds for each percent grade roach grade is an upgrade that exceeds 3 perc	it onto or cro itans that cann	oss a <u>2-lane hi</u> not store the de	<u>ghway</u> with <u>n</u> sign vehicle.
CASE B: median a For cross +(+(for each a for mino +(f the app CASE F For left-tt +(road approach grades:) 2 seconds for each percent grade roach grade is an upgrade that exceeds 3 perc ud grades 3 percent or less ing a major road with more than 2 lanes:) 5 seconds for passenger cars) 7 seconds for trucks diditional lane to be crossed and narrow med croad approach grades:) 1 seconds for each percent grade roach grade is an upgrade that exceeds 3 per - For a stopped vehicle to turn across <u>one</u> ming vehicles that cross more than 1 opposi 5 seconds for passenger cars	ent. it on to or creations that cannot be the second secon	oss a <u>2-lane hi</u> not store the de sing traffic	<u>ghwav</u> with <u>p</u> sign vehicle.

APPENDIX F HCM ANALYSIS OUTPUT SHEETS

Int Delay, s/veh

3.6

Movement	FBI	FBT	FBR	WBI	WBT	WBR	NBI	NBT	NBR	SBI	SBT	SBR
Lane Configurations	7		1				7	1		002	1	ODIX
Traffic Vol, veh/h	67	0	131	0	0	0	37	231	0	0	552	48
Future Vol, veh/h	67	0	131	0	0	0	37	231	0	0	552	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	0	-	0	-	-	-	300	-	-	-	-	-
Veh in Median Storage,	,# -	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	73	0	142	0	0	0	40	251	0	0	600	52

0
-
-
-
-
-
-
-
-
-
-
-
-
-
-

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

Int Delay, s/veh

14.5

	EDI	EDT			MOT		NIDI	NDT	NDD	0.01	ODT	000
Movement	EBL	EBT	EBR	WBL	WBI	WBR	NBL	NBT	NBK	SBL	SBT	SBR
Lane Configurations	7		1				7	1			1.	
Traffic Vol, veh/h	118	0	92	0	0	0	99	473	0	0	290	85
Future Vol, veh/h	118	0	92	0	0	0	99	473	0	0	290	85
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	300	-	-	-	-	-
Veh in Median Storage	e,# -	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	153	0	119	0	0	0	129	614	0	0	377	110

Major/Minor	Minor2			Major1		Μ	lajor2			
Conflicting Flow All	1304	-	432	487	0	-	-	-	0	
Stage 1	432	-	-	-	-	-	-	-	-	
Stage 2	872	-	-	-	-	-	-	-	-	
Critical Hdwy	6.42	-	6.22	4.12	-	-	-	-	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	-	3.318	2.218	-	-	-	-	-	
Pot Cap-1 Maneuver	177	0	624	1076	-	0	0	-	-	
Stage 1	655	0	-	-	-	0	0	-	-	
Stage 2	409	0	-	-	-	0	0	-	-	
Platoon blocked, %					-			-	-	
Mov Cap-1 Maneuver	156	0	624	1076	-	-	-	-	-	
Mov Cap-2 Maneuver	156	0	-	-	-	-	-	-	-	
Stage 1	576	0	-	-	-	-	-	-	-	
Stage 2	409	0	-	-	-	-	-	-	-	
Approach	EB			NB			SB			
HCM Control Delay, s	/v 75.7			1.5			0			
HCM LOS	F									

HCM LOS

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

Int Delay, s/veh

3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1		*				1	1			t.	
Traffic Vol, veh/h	68	0	133	0	0	0	38	304	0	0	607	49
Future Vol, veh/h	68	0	133	0	0	0	38	304	0	0	607	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	300	-	-	-	-	-
Veh in Median Storage	, # -	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	74	0	145	0	0	0	41	330	0	0	660	53

Major/Minor	Minor2			Major1		М	ajor2			
Conflicting Flow All	1099	-	687	713	0	-	-	-	0	
Stage 1	687	-	-	-	-	-	-	-	-	
Stage 2	412	-	-	-	-	-	-	-	-	
Critical Hdwy	6.42	-	6.22	4.12	-	-	-	-	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	-	3.318	2.218	-	-	-	-	-	
Pot Cap-1 Maneuver	235	0	447	887	-	0	0	-	-	
Stage 1	499	0	-	-	-	0	0	-	-	
Stage 2	669	0	-	-	-	0	0	-	-	
Platoon blocked, %					-			-	-	
Mov Cap-1 Maneuver	224	0	447	887	-	-	-	-	-	
Mov Cap-2 Maneuver	224	0	-	-	-	-	-	-	-	
Stage 1	476	0	-	-	-	-	-	-	-	
Stage 2	669	0	-	-	-	-	-	-	-	
Approach	EB			NB			SB			
HCM Control Delay, s	/v 20.9			1			0			

HCM LOS C

Minor Lane/Major Mvmt	NBL	NBT E	BLn1 I	EBLn2	SBT	SBR
Capacity (veh/h)	887	-	224	447	-	-
HCM Lane V/C Ratio	0.047	-	0.33	0.323	-	-
HCM Control Delay (s/veh)	9.3	-	28.8	16.9	-	-
HCM Lane LOS	А	-	D	С	-	-
HCM 95th %tile Q (veh)	0.1	-	1.4	1.4	-	-

													(
Int Delay, s/veh	25.3												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	2		1				1	1			1		
Traffic Vol, veh/h	120	0	93	0	0	0	100	541	0	0	358	86	
Future Vol, veh/h	120	0	93	0	0	0	100	541	0	0	358	86	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None										
Storage Length	0	-	0	-	-	-	300	-	-	-	-	-	
Veh in Median Storage,	,# -	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	156	0	121	0	0	0	130	703	0	0	465	112	

Major/Minor	Minor2					Ν	/lajor1		ľ	Major2				
Conflicting Flow All	1484	-	521				577	0	-	-	-	0		
Stage 1	521	-	-				-	-	-	-	-	-		
Stage 2	963	-	-				-	-	-	-	-	-		
Critical Hdwy	6.42	-	6.22				4.12	-	-	-	-	-		
Critical Hdwy Stg 1	5.42	-	-				-	-	-	-	-	-		
Critical Hdwy Stg 2	5.42	-	-				-	-	-	-	-	-		
Follow-up Hdwy	3.518	-	3.318				2.218	-	-	-	-	-		
Pot Cap-1 Maneuver	~ 137	0	555				996	-	0	0	-	-		
Stage 1	596	0	-				-	-	0	0	-	-		
Stage 2	370	0	-				-	-	0	0	-	-		
Platoon blocked, %								-			-	-		
Mov Cap-1 Maneuver	~ 119	0	555				996	-	-	-	-	-		
Mov Cap-2 Maneuver	~ 119	0	-				-	-	-	-	-	-		
Stage 1	518	0	-				-	-	-	-	-	-		
Stage 2	370	0	-				-	-	-	-	-	-		
Approach	EB						NB			SB				
HCM Control Delay, s/	/v149.8						1.4			0			 	
HCM LOS	F													
Minor Lane/Major Mvr	nt	NBL	NBT E	EBLn1 E	EBLn2	SBT	SBR							
Capacity (veh/h)		996	-	119	555	-	-							
HCM Lane V/C Ratio		0.13	-	1.31	0.218	-	-							
HCM Control Delay (s	/veh)	9.2	-	255.5	13.3	-	-							
HCM Lane LOS	,	А	-	F	В	-	-							
HCM 95th %tile Q (ve	h)	0.4	-	10.3	0.8	-	-							
Notes														

-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon
Int Delay, s/veh

5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	Ť	1		4		7	F.		5	1	7
Traffic Vol, veh/h	68	2	133	12	6	18	38	310	4	7	609	49
Future Vol, veh/h	68	2	133	12	6	18	38	310	4	7	609	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	180	-	0	-	-	-	300	-	-	265	-	390
Veh in Median Storage	, # -	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	74	2	145	13	7	20	41	337	4	8	662	53

Major/Minor	Minor2			Minor1			Major1			Major2			
Conflicting Flow All	1113	1101	662	1199	1152	339	715	0	0	341	0	0	
Stage 1	678	678	-	421	421	-	-	-	-	-	-	-	
Stage 2	435	423	-	778	731	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	186	212	462	162	198	703	885	-	-	1218	-	-	
Stage 1	442	452	-	610	589	-	-	-	-	-	-	-	
Stage 2	600	588	-	389	427	-	-	-	-	-	-	-	
Platoon blocked, %								-	-		-	-	
Mov Cap-1 Maneuver	169	201	462	106	188	703	885	-	-	1218	-	-	
Mov Cap-2 Maneuver	169	201	-	106	188	-	-	-	-	-	-	-	
Stage 1	422	449	-	582	562	-	-	-	-	-	-	-	
Stage 2	550	561	-	264	424	-	-	-	-	-	-	-	
Annroach	FB			WR			NB			SB			
HCM Control Delay	<u>/v 24.0</u>			25.0			1			0.1			

HCM LOS C D

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3V	VBLn1	SBL	SBT	SBR	
Capacity (veh/h)	885	-	-	169	201	462	211	1218	-	-	
HCM Lane V/C Ratio	0.047	-	-	0.437	0.011	0.313	0.185	0.006	-	-	
HCM Control Delay (s/veh)	9.3	-	-	41.9	23.1	16.3	25.9	8	-	-	
HCM Lane LOS	А	-	-	Е	С	С	D	А	-	-	
HCM 95th %tile Q (veh)	0.1	-	-	2	0	1.3	0.7	0	-	-	

Int Delay, s/veh	7.7						
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	Þ		7	↑	7	7	
Traffic Vol, veh/h	0	13	25	0	36	72	
Future Vol, veh/h	0	13	25	0	36	72	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	-	None	-	None	-	None	
Storage Length	-	-	265	-	0	0	
Veh in Median Storage	e, # 0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	0	14	27	0	39	78	

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0 14	0 61	7	
Stage 1	-		- 7	-	
Stage 2	-		- 54	-	
Critical Hdwy	-	- 4.12	- 6.42	6.22	
Critical Hdwy Stg 1	-		- 5.42	-	
Critical Hdwy Stg 2	-		- 5.42	-	
Follow-up Hdwy	-	- 2.218	- 3.518	3.318	
Pot Cap-1 Maneuver	-	- 1604	- 945	1075	
Stage 1	-		- 1016	-	
Stage 2	-		- 969	-	
Platoon blocked, %	-	-	-		
Mov Cap-1 Maneuver	-	- 1604	- 929	1075	
Mov Cap-2 Maneuver	-		- 929	-	
Stage 1	-		- 1016	-	
Stage 2	-		- 953	-	
Annroach	FR	WB	NR		
HCM Control Delay st		73	8.7		
HCM LOS	v U	1.5	Δ		

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

Int Delay, s/veh	1.4							
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations	2		2	↑	1	1		
Traffic Vol, veh/h	42	30	10	627	607	15		
Future Vol, veh/h	42	30	10	627	607	15		
Conflicting Peds, #/hr	0	0	0	0	0	0		
Sign Control	Stop	Stop	Free	Free	Free	Free		
RT Channelized	-	None	-	None	-	None		
Storage Length	265	0	265	-	-	390		
Veh in Median Storage	, # 0	-	-	0	0	-		
Grade, %	0	-	-	0	0	-		
Peak Hour Factor	95	95	95	95	95	95		
Heavy Vehicles, %	2	2	2	2	2	2		
Mvmt Flow	44	32	11	660	639	16		

Major/Minor	Minor2		Major1	Maj	or2		
Conflicting Flow All	1321	639	655	0	-	0	
Stage 1	639	-	-	-	-	-	
Stage 2	682	-	-	-	-	-	
Critical Hdwy	6.42	6.22	4.12	-	-	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	-	
Follow-up Hdwy	3.518	3.318	2.218	-	-	-	
Pot Cap-1 Maneuver	173	476	932	-	-	-	
Stage 1	526	-	-	-	-	-	
Stage 2	502	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	171	476	932	-	-	-	
Mov Cap-2 Maneuver	171	-	-	-	-	-	
Stage 1	520	-	-	-	-	-	
Stage 2	502	-	-	-	-	-	

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

Minor Lane/Major Mvmt	NBL	NBT EBL	1 EBLn2	SBT	SBR	
Capacity (veh/h)	932	- 1	71 476	-	-	
HCM Lane V/C Ratio	0.011	- 0.2	59 0.066	-	-	
HCM Control Delay (s/veh)	8.9	- 33	.2 13.1	-	-	
HCM Lane LOS	А	-	D B	-	-	
HCM 95th %tile Q (veh)	0	-	1 0.2	-	-	

Int Delay, s/veh	0.2						
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	Y		To			र्भ	
Traffic Vol, veh/h	6	6	346	2	2	752	
Future Vol, veh/h	6	6	346	2	2	752	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	-	-	-	-	-	
Veh in Median Storage	e, # 0	-	0	-	-	0	
Grade, %	0	-	0	-	-	0	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	7	7	376	2	2	817	

Major/Minor	Minor1	Ν	/lajor1	Ма	ajor2		
Conflicting Flow All	1198	377	0	0	378	0	
Stage 1	377	-	-	-	-	-	
Stage 2	821	-	-	-	-	-	
Critical Hdwy	6.42	6.22	-	-	4.12	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	-	
Follow-up Hdwy	3.518	3.318	-	- 2	.218	-	
Pot Cap-1 Maneuver	205	670	-	- '	1180	-	
Stage 1	694	-	-	-	-	-	
Stage 2	432	-	-	-	-	-	
Platoon blocked, %			-	-		-	
Mov Cap-1 Maneuver	204	670	-	- '	1180	-	
Mov Cap-2 Maneuver	204	-	-	-	-	-	
Stage 1	694	-	-	-	-	-	
Stage 2	431	-	-	-	-	-	

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

Minor Lane/Major Mvmt	NBT	NBRW	/BLn1	SBL	SBT
Capacity (veh/h)	-	-	313	1180	-
HCM Lane V/C Ratio	-	-	0.042	0.002	-
HCM Control Delay (s/veh)	-	-	17	8.1	0
HCM Lane LOS	-	-	С	А	А
HCM 95th %tile Q (veh)	-	-	0.1	0	-

Int Delay, s/veh

52.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	1	1		4		7	1.		٦	1	7
Traffic Vol, veh/h	120	7	93	8	4	13	100	545	14	21	365	86
Future Vol, veh/h	120	7	93	8	4	13	100	545	14	21	365	86
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	180	-	0	-	-	-	300	-	-	265	-	390
Veh in Median Storage	, # -	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	156	9	121	10	5	17	130	708	18	27	474	112

Major/Minor	Minor2			Vinor1		I	Major1		ľ	Major2				
Conflicting Flow All	1516	1514	474	1626	1617	717	586	0	0	726	0	0		
Stage 1	528	528	-	977	977	-	-	-	-	-	-	-		
Stage 2	988	986	-	649	640	-	-	-	-	-	-	-		
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-		
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-		
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-		
Pot Cap-1 Maneuver	~ 98	120	590	82	103	430	989	-	-	877	-	-		
Stage 1	534	528	-	302	329	-	-	-	-	-	-	-		
Stage 2	297	326	-	458	470	-	-	-	-	-	-	-		
Platoon blocked, %								-	-		-	-		
Mov Cap-1 Maneuver	~ 79	101	590	53	87	430	989	-	-	877	-	-		
Mov Cap-2 Maneuver	~ 79	101	-	53	87	-	-	-	-	-	-	-		
Stage 1	464	512	-	262	286	-	-	-	-	-	-	-		
Stage 2	243	283	-	347	455	-	-	-	-	-	-	-		
Approach	EB			WB			NB			SB				
HCM Control Delay, s	\$/315.9			50.9			1.4			0.4				
HCM LOS	F			F										
Minor Lane/Major Mvr	nt	NBL	NBT	NBR	EBLn1	EBLn2 I	EBLn3V	VBLn1	SBL	SBT	SBR			
Capacity (veh/h)		989	-	-	79	101	590	110	877	-	-			
HCM Lane V/C Ratio		0.131	-	-	1.973	0.09	0.205	0.295	0.031	-	-			
HCM Control Delay (s	/veh)	9.2	-	-\$	566.7	44.1	12.7	50.9	9.2	-	-			
HCM Lane LOS	,	А	-	-	F	E	В	F	А	-	-			
HCM 95th %tile Q (ve	h)	0.5	-	-	13.8	0.3	0.8	1.1	0.1	-	-			
Notes														
~: Volume exceeds ca	pacity	\$: De	elay exc	eeds 3	00s	+: Com	putatior	n Not De	efined	*: All	major vol	ume in pl	atoon	

Int Delay, s/veh	6.5						
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	Þ		7	↑	7	7	
Traffic Vol, veh/h	0	42	84	0	25	49	
Future Vol, veh/h	0	42	84	0	25	49	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	-	None	-	None	-	None	
Storage Length	-	-	265	-	0	0	
Veh in Median Storage,	# 0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	0	46	91	0	27	53	

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0 46	0 205	23	
Stage 1	-		- 23	-	
Stage 2	-		- 182	-	
Critical Hdwy	-	- 4.12	- 6.42	6.22	
Critical Hdwy Stg 1	-		- 5.42	-	
Critical Hdwy Stg 2	-		- 5.42	-	
Follow-up Hdwy	-	- 2.218	- 3.518	3.318	
Pot Cap-1 Maneuver	-	- 1562	- 783	1054	
Stage 1	-		- 1000	-	
Stage 2	-		- 849	-	
Platoon blocked, %	-	-	-		
Mov Cap-1 Maneuver	-	- 1562	- 738	1054	
Mov Cap-2 Maneuver	-		- 738	-	
Stage 1	-		- 1000	-	
Stage 2	-		- 800	-	
Approach	EB	WB	NB		
HCM Control Delay, s	/v 0	7.4	9.1		
HCM LOS			A		

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

Int Delay, s/veh	1.2								
Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations	1	1	7	Ť	1	7			
Traffic Vol, veh/h	29	20	35	782	676	49			
Future Vol, veh/h	29	20	35	782	676	49			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Stop	Stop	Free	Free	Free	Free			
RT Channelized	-	None	-	None	-	None			
Storage Length	265	0	265	-	-	390			
Veh in Median Storage	,# 0	-	-	0	0	-			
Grade, %	0	-	-	0	0	-			
Peak Hour Factor	97	97	97	97	97	97			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	30	21	36	806	697	51			

Major/Minor	Minor2		Major1	Maj	or2		
Conflicting Flow All	1575	697	748	0	-	0	
Stage 1	697	-	-	-	-	-	
Stage 2	878	-	-	-	-	-	
Critical Hdwy	6.42	6.22	4.12	-	-	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	-	
Follow-up Hdwy	3.518	3.318	2.218	-	-	-	
Pot Cap-1 Maneuver	121	441	861	-	-	-	
Stage 1	494	-	-	-	-	-	
Stage 2	406	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	116	441	861	-	-	-	
Mov Cap-2 Maneuver	116	-	-	-	-	-	
Stage 1	473	-	-	-	-	-	
Stage 2	406	-	-	-	-	-	

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

Minor Lane/Major Mvmt	NBL	NBT EBLr	1 EBLn2	SBT	SBR	
Capacity (veh/h)	861	- 11	6 441	-	-	
HCM Lane V/C Ratio	0.042	- 0.25	8 0.047	-	-	
HCM Control Delay (s/veh)	9.4	- 46	5 13.6	-	-	
HCM Lane LOS	А	-	E B	-	-	
HCM 95th %tile Q (veh)	0.1	-	1 0.1	-	-	

0.2					
WBL	WBR	NBT	NBR	SBL	SBT
Y		1.			ŧ
4	4	656	7	7	460
4	4	656	7	7	460
0	0	0	0	0	0
Stop	Stop	Free	Free	Free	Free
-	None	-	None	-	None
0	-	-	-	-	-
,# 0	-	0	-	-	0
0	-	0	-	-	0
92	92	92	92	92	92
2	2	2	2	2	2
4	4	713	8	8	500
	0.2 WBL 4 4 0 Stop - 0 , # 0 0 92 2 4	0.2 WBL WBR WB4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	0.2 WBL WBR NBT	0.2 WBR NBT NBR WBL WBR NBT NBR Y · · · 4 656 7 · 4 4 656 7 4 4 656 7 0 0 0 0 Stop Stop Free Free 0 - O - 0 - 0 - 10 - 0 - 92 92 92 92 92 2 2 2 4 4 713 8	0.2 NBR NBR SBL WBL WBR NBT NBR SBL Y F SBL 4 4 656 7 7 4 4 656 7 7 0 0 0 0 0 Stop Free Free Free 0 - None - 0 - 0 - - 0 - 0 - - 92 92 92 92 92 2 2 2 2 2 4 4 713 8 8

Major/Minor	Minor1	Ν	lajor1	N	1ajor2	
Conflicting Flow All	1233	717	0	0	721	0
Stage 1	717	-	-	-	-	-
Stage 2	516	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	195	430	-	-	881	-
Stage 1	484	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	192	430	-	-	881	-
Mov Cap-2 Maneuver	192	-	-	-	-	-
Stage 1	484	-	-	-	-	-
Stage 2	591	-	-	-	-	-
Annraach	\//D		ND		CD.	

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

Minor Lane/Major Mvmt	NBT	NBRV	VBLn1	SBL	SBT
Capacity (veh/h)	-	-	265	881	-
HCM Lane V/C Ratio	-	-	0.033	0.009	-
HCM Control Delay (s/veh)	-	-	19	9.1	0
HCM Lane LOS	-	-	С	А	А
HCM 95th %tile Q (veh)	-	-	0.1	0	-

Int Delay, s/veh

5.9

					LA ID T		NE	NDT		0.01	0.D.T	000
Movement	EBL	EBT	EBR	WBL	WBI	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	†	1		4		7	1.		٦	1	٢
Traffic Vol, veh/h	79	0	154	0	0	0	44	342	0	0	697	57
Future Vol, veh/h	79	0	154	0	0	0	44	342	0	0	697	57
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	180	-	0	-	-	-	300	-	-	265	-	390
Veh in Median Storage	, # -	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	86	0	167	0	0	0	48	372	0	0	758	62

Major/Minor	Minor2		l	Minor1			Major1			Major2			
Conflicting Flow All	1226	1226	758	1341	1288	372	820	0	0	372	0	0	
Stage 1	758	758	-	468	468	-	-	-	-	-	-	-	
Stage 2	468	468	-	873	820	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	155	179	407	129	164	674	809	-	-	1186	-	-	
Stage 1	399	415	-	575	561	-	-	-	-	-	-	-	
Stage 2	575	561	-	345	389	-	-	-	-	-	-	-	
Platoon blocked, %								-	-		-	-	
Mov Cap-1 Maneuver	148	168	407	72	154	674	809	-	-	1186	-	-	
Mov Cap-2 Maneuver	148	168	-	72	154	-	-	-	-	-	-	-	
Stage 1	375	415	-	541	528	-	-	-	-	-	-	-	
Stage 2	541	528	-	203	389	-	-	-	-	-	-	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s/	/v 33			0			1.1			0			

HCM LOS D A

Minor Lane/Major Mvmt	NBL	NBT	NBR E	BLn1 E	EBLn2 I	EBLn3V	VBLn1	SBL	SBT	SBR
Capacity (veh/h)	809	-	-	148	-	407	-	1186	-	-
HCM Lane V/C Ratio	0.059	-	-	0.58	-	0.411	-	-	-	-
HCM Control Delay (s/veh)	9.7	-	-	58.5	0	19.9	0	0	-	-
HCM Lane LOS	А	-	-	F	А	С	А	А	-	-
HCM 95th %tile Q (veh)	0.2	-	-	3	-	2	-	0	-	-

Int Delay, s/veh

78.8

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	†	1		4		7	1.		٦	1	7
Traffic Vol, veh/h	139	0	108	0	0	0	117	618	0	0	406	100
Future Vol, veh/h	139	0	108	0	0	0	117	618	0	0	406	100
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	180	-	0	-	-	-	300	-	-	265	-	390
Veh in Median Storage	, # -	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	181	0	140	0	0	0	152	803	0	0	527	130

Major/Minor	Minor2			Minor1			Major1		Ν	/lajor2				
Conflicting Flow All	1634	1634	527	1769	1764	803	657	0	0	803	0	0		
Stage 1	527	527	-	1107	1107	-	-	-	-	-	-	-		
Stage 2	1107	1107	-	662	657	-	-	-	-	-	-	-		
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-		
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-		
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-		
Pot Cap-1 Maneuver	~ 81	101	551	65	84	383	931	-	-	821	-	-		
Stage 1	535	528	-	255	286	-	-	-	-	-	-	-		
Stage 2	255	286	-	451	462	-	-	-	-	-	-	-		
Platoon blocked, %								-	-		-	-		
Mov Cap-1 Maneuver	~ 71	85	551	42	70	383	931	-	-	821	-	-		
Mov Cap-2 Maneuver	~ 71	85	-	42	70	-	-	-	-	-	-	-		
Stage 1	448	528	-	213	239	-	-	-	-	-	-	-		
Stage 2	213	239	-	336	462	-	-	-	-	-	-	-		
Approach	ED			\\/D			ND			CD				
Approach	<u>ED</u>			000			1.5							
HCM LOS	⊅V4/U.4 ⊏			0			1.J			U				
	Г			A										
Minor Lane/Major Mvr	nt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3V	VBLn1	SBL	SBT	SBR			
Capacity (veh/h)		931	-	-	71	-	551	-	821	-	-			
HCM Lane V/C Ratio		0.163	-	-	2.543	-	0.255	-	-	-	-			
HCM Control Delay (s	/veh)	9.6	-	-\$	825.2	0	13.8	0	0	-	-			
HCM Lane LOS	·	А	-	-	F	А	В	А	А	-	-			
HCM 95th %tile Q (ve	h)	0.6	-	-	17.5	-	1	-	0	-	-			
Notes														
~: Volume exceeds ca	apacity	\$: De	elay exc	ceeds 3	00s	+: Com	putation	Not De	fined	*: All	major vo	lume in r	olatoon	

Int Delay, s/veh

7.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	2	1	*		4		2	4		5	1	1
Traffic Vol, veh/h	79	2	154	12	6	18	44	348	4	7	699	57
Future Vol, veh/h	79	2	154	12	6	18	44	348	4	7	699	57
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	180	-	0	-	-	-	300	-	-	265	-	390
Veh in Median Storage	, # -	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	86	2	167	13	7	20	48	378	4	8	760	62

Major/Minor	Minor2			Minor1			Major1		ſ	Major2			
Conflicting Flow All	1266	1254	760	1368	1314	380	822	0	0	382	0	0	
Stage 1	776	776	-	476	476	-	-	-	-	-	-	-	
Stage 2	490	478	-	892	838	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	146	172	406	124	158	667	807	-	-	1176	-	-	
Stage 1	390	407	-	570	557	-	-	-	-	-	-	-	
Stage 2	560	556	-	337	382	-	-	-	-	-	-	-	
Platoon blocked, %								-	-		-	-	
Mov Cap-1 Maneuver	130	161	406	68	148	667	807	-	-	1176	-	-	
Mov Cap-2 Maneuver	130	161	-	68	148	-	-	-	-	-	-	-	
Stage 1	367	404	-	536	524	-	-	-	-	-	-	-	
Stage 2	505	523	-	196	379	-	-	-	-	-	-	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s	/v 38.5			37.8			1.1			0.1			

HCIM Control Delay, S/	V 30.5	37.8	
HCM LOS	E	E	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3V	VBLn1	SBL	SBT	SBR	
Capacity (veh/h)	807	-	-	130	161	406	148	1176	-	-	
HCM Lane V/C Ratio	0.059	-	-	0.661	0.014	0.412	0.264	0.006	-	-	
HCM Control Delay (s/veh)	9.7	-	-	74.9	27.7	19.9	37.8	8.1	-	-	
HCM Lane LOS	А	-	-	F	D	С	E	А	-	-	
HCM 95th %tile Q (veh)	0.2	-	-	3.6	0	2	1	0	-	-	

Int Delay, s/veh	7.7						
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	T.		7	↑	7	7	
Traffic Vol, veh/h	0	13	25	0	36	72	
Future Vol, veh/h	0	13	25	0	36	72	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	-	None	-	None	-	None	
Storage Length	-	-	265	-	0	0	
Veh in Median Storage,	,# 0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	0	14	27	0	39	78	

Major1	Major2	Minor1	
0	0 14	0 61	7
-		- 7	-
-		- 54	-
-	- 4.12	- 6.42	6.22
-		- 5.42	-
-		- 5.42	-
-	- 2.218	- 3.518	3.318
-	- 1604	- 945	1075
-		- 1016	-
-		- 969	-
-	-	-	
- 1	- 1604	- 929	1075
r -		- 929	-
-		- 1016	-
-		- 953	-
FB	WB	NB	
$\frac{20}{3}$	7.3	87	
	1.0	A	
	Major1 0	Major1 Major2 0 0 14 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 1604 - - - - - - - - 1604 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -	Major1 Major2 Minor1 0 0 14 0 61 - - - 7 - - - 7 - - - 7 - - - 74 - - - 54 - - 4.12 - 6.42 - - - 5.42 - - 5.42 - - - 5.42 - 5.42 - 5.42 - - - 5.42 - 5.42 - 5.42 - - - 5.42 - 5.42 - 5.42 - - 1604 - 945 - - 969 - - 1604 - 929 - - - 953 EB WB NB NB NB NB NB NB

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

Int Delay, s/veh	1.1						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	7	1	7	**	**	7	
Traffic Vol, veh/h	42	30	10	725	703	15	
Future Vol, veh/h	42	30	10	725	703	15	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	265	0	265	-	-	390	
Veh in Median Storage	,# 0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	95	95	95	95	95	95	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	44	32	11	763	740	16	

Major/Minor	Minor2	Ν	/lajor1	Maj	or2		
Conflicting Flow All	1144	370	756	0	-	0	
Stage 1	740	-	-	-	-	-	
Stage 2	404	-	-	-	-	-	
Critical Hdwy	6.84	6.94	4.14	-	-	-	
Critical Hdwy Stg 1	5.84	-	-	-	-	-	
Critical Hdwy Stg 2	5.84	-	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.22	-	-	-	
Pot Cap-1 Maneuver	193	627	851	-	-	-	
Stage 1	433	-	-	-	-	-	
Stage 2	643	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	r 190	627	851	-	-	-	
Mov Cap-2 Maneuver	r 190	-	-	-	-	-	
Stage 1	427	-	-	-	-	-	
Stage 2	643	-	-	-	-	-	

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

Minor Lane/Major Mvmt	NBL	NBT EBLn1 E	BLn2	SBT	SBR	
Capacity (veh/h)	851	- 190	627	-	-	
HCM Lane V/C Ratio	0.012	- 0.233	0.05	-	-	
HCM Control Delay (s/veh)	9.3	- 29.6	11	-	-	
HCM Lane LOS	А	- D	В	-	-	
HCM 95th %tile Q (veh)	0	- 0.9	0.2	-	-	

Int Delay, s/veh	0.2						
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	Y		To			र्भ	
Traffic Vol, veh/h	6	6	390	2	2	864	
Future Vol, veh/h	6	6	390	2	2	864	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	-	-	-	-	-	
Veh in Median Storage	,# 0	-	0	-	-	0	
Grade, %	0	-	0	-	-	0	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	7	7	424	2	2	939	

Major/Minor	Minor1	Ν	/lajor1	Μ	lajor2		
Conflicting Flow All	1368	425	0	0	426	0	
Stage 1	425	-	-	-	-	-	
Stage 2	943	-	-	-	-	-	
Critical Hdwy	6.42	6.22	-	-	4.12	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	-	
Follow-up Hdwy	3.518	3.318	-	- 1	2.218	-	
Pot Cap-1 Maneuver	162	629	-	-	1133	-	
Stage 1	659	-	-	-	-	-	
Stage 2	379	-	-	-	-	-	
Platoon blocked, %			-	-		-	
Mov Cap-1 Maneuver	161	629	-	-	1133	-	
Mov Cap-2 Maneuver	161	-	-	-	-	-	
Stage 1	659	-	-	-	-	-	
Stage 2	377	-	-	-	-	-	

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

Minor Lane/Major Mvmt	NBT	NBRWE	3Ln1	SBL	SBT	
Capacity (veh/h)	-	-	256	1133	-	
HCM Lane V/C Ratio	-	- 0	.051	0.002	-	
HCM Control Delay (s/veh)	-	-	19.8	8.2	0	
HCM Lane LOS	-	-	С	А	А	
HCM 95th %tile Q (veh)	-	-	0.2	0	-	

Int Delay, s/veh

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	A	1		4		7	1.		٦	1	7
Traffic Vol, veh/h	139	7	108	8	4	13	117	622	14	21	413	100
Future Vol, veh/h	139	7	108	8	4	13	117	622	14	21	413	100
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	180	-	0	-	-	-	300	-	-	265	-	390
Veh in Median Storage	,# -	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	181	9	140	10	5	17	152	808	18	27	536	130

Major/Minor	Minor2			Minor1			Major1		1	Major2				
Conflicting Flow All	1722	1720	536	1851	1841	817	666	0	0	826	0	0		
Stage 1	590	590	-	1121	1121	-	-	-	-	-	-	-		
Stage 2	1132	1130	-	730	720	-	-	-	-	-	-	-		
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-		
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-		
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-		
Pot Cap-1 Maneuver	~ 70	89	545	57	75	376	923	-	-	805	-	-		
Stage 1	494	495	-	250	282	-	-	-	-	-	-	-		
Stage 2	247	279	-	414	432	-	-	-	-	-	-	-		
Platoon blocked, %								-	-		-	-		
Mov Cap-1 Maneuve	er ~ 53	72	545	33	61	376	923	-	-	805	-	-		
Mov Cap-2 Maneuve	er ~ 53	72	-	33	61	-	-	-	-	-	-	-		
Stage 1	412	478	-	209	235	-	-	-	-	-	-	-		
Stage 2	193	233	-	291	417	-	-	-	-	-	-	-		
Approach	ED			\//D			ND			СD				
	ED			00			110			0.4				
HCM Control Delay,	SAV000./			09			1.5			0.4				
	г			Г										
Minor Lane/Major M	/mt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3V	VBLn1	SBL	SBT	SBR			
Capacity (veh/h)		923	-	-	53	72	545	73	805	-	-			
HCM Lane V/C Ratio)	0.165	-	-	3.406	0.126	0.257	0.445	0.034	-	-			
HCM Control Delay (s/veh)	9.7	-	\$	1244.5	62.1	13.9	89	9.6	-	-			
HCM Lane LOS	. ,	А	-	-	F	F	В	F	А	-	-			
HCM 95th %tile Q (v	eh)	0.6	-	-	19.4	0.4	1	1.8	0.1	-	-			
Notes	,													
	anacity	\$. D		soode 3	000	+· Com	nutatio	Not D	ofinod	*· ΔII	maiorvo	lumo in	nlatoon	

Int Delay, s/veh	6.5						
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	Þ		7	↑	7	7	
Traffic Vol, veh/h	0	42	84	0	25	49	
Future Vol, veh/h	0	42	84	0	25	49	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	-	None	-	None	-	None	
Storage Length	-	-	265	-	0	0	
Veh in Median Storage,	# 0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	0	46	91	0	27	53	

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0 46	0 205	23	
Stage 1	-		- 23	-	
Stage 2	-		- 182	-	
Critical Hdwy	-	- 4.12	- 6.42	6.22	
Critical Hdwy Stg 1	-		- 5.42	-	
Critical Hdwy Stg 2	-		- 5.42	-	
Follow-up Hdwy	-	- 2.218	- 3.518	3.318	
Pot Cap-1 Maneuver	-	- 1562	- 783	1054	
Stage 1	-		- 1000	-	
Stage 2	-		- 849	-	
Platoon blocked, %	-	-	-		
Mov Cap-1 Maneuver	-	- 1562	- 738	1054	
Mov Cap-2 Maneuver	-		- 738	-	
Stage 1	-		- 1000	-	
Stage 2	-		- 800	-	
Annroach	FB	WR	NR		
HCM Control Dolov o		7.4	0.1		
HOM LOC	/ 0	1.4	9.1		
HUM LUS			A		

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

Int Delay, s/veh	0.9							
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations	1	1	7	**	**	7		
Traffic Vol, veh/h	29	20	35	906	781	49		
Future Vol, veh/h	29	20	35	906	781	49		
Conflicting Peds, #/hr	0	0	0	0	0	0		
Sign Control	Stop	Stop	Free	Free	Free	Free		
RT Channelized	-	None	-	None	-	None		
Storage Length	265	0	265	-	-	390		
Veh in Median Storage	e, # 0	-	-	0	0	-		
Grade, %	0	-	-	0	0	-		
Peak Hour Factor	97	97	97	97	97	97		
Heavy Vehicles, %	2	2	2	2	2	2		
Mvmt Flow	30	21	36	934	805	51		

Major/Minor	Minor2	Ν	/lajor1	Мај	or2				
Conflicting Flow All	1344	403	856	0	-	0			
Stage 1	805	-	-	-	-	-			
Stage 2	539	-	-	-	-	-			
Critical Hdwy	6.84	6.94	4.14	-	-	-			
Critical Hdwy Stg 1	5.84	-	-	-	-	-			
Critical Hdwy Stg 2	5.84	-	-	-	-	-			
Follow-up Hdwy	3.52	3.32	2.22	-	-	-			
Pot Cap-1 Maneuver	143	597	780	-	-	-			
Stage 1	400	-	-	-	-	-			
Stage 2	549	-	-	-	-	-			
Platoon blocked, %				-	-	-			
Mov Cap-1 Maneuver	136	597	780	-	-	-			
Mov Cap-2 Maneuver	· 136	-	-	-	-	-			
Stage 1	382	-	-	-	-	-			
Stage 2	549	-	-	-	-	-			

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

Minor Lane/Major Mvmt	NBL	NBT E	BLn1	EBLn2	SBT	SBR	
Capacity (veh/h)	780	-	136	597	-	-	
HCM Lane V/C Ratio	0.046	-	0.22	0.035	-	-	
HCM Control Delay (s/veh)	9.8	-	38.8	11.2	-	-	
HCM Lane LOS	А	-	E	В	-	-	
HCM 95th %tile Q (veh)	0.1	-	0.8	0.1	-	-	

Int Delay, s/veh	0.2						
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	Y		Þ			र्भ	
Traffic Vol, veh/h	4	4	749	7	7	522	
Future Vol, veh/h	4	4	749	7	7	522	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	-	-	-	-	-	
Veh in Median Storage	, # 0	-	0	-	-	0	
Grade, %	0	-	0	-	-	0	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	4	4	814	8	8	567	

Major/Minor	Minor1	Ν	/lajor1	Ν	/lajor2	
Conflicting Flow All	1401	818	0	0	822	0
Stage 1	818	-	-	-	-	-
Stage 2	583	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	154	376	-	-	807	-
Stage 1	434	-	-	-	-	-
Stage 2	558	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	152	376	-	-	807	-
Mov Cap-2 Maneuver	152	-	-	-	-	-
Stage 1	434	-	-	-	-	-
Stage 2	550	-	-	-	-	-

Approach	WB	NB	SB	
HCM Control Delay, s/v	22.4	0	0.1	
HCMLOS	С			

Minor Lane/Major Mvmt	NBT	NBRW	/BLn1	SBL	SBT	
Capacity (veh/h)	-	-	216	807	-	
HCM Lane V/C Ratio	-	-	0.04	0.009	-	
HCM Control Delay (s/veh)	-	-	22.4	9.5	0	
HCM Lane LOS	-	-	С	А	А	
HCM 95th %tile Q (veh)	-	-	0.1	0	-	

Lanes, Volumes, TimingsHorizon Year (2035) Buildout Conditions with Mitigations1: Universe Blvd. & Woodmont Ave./Woodmont Ave. Extension05/30/2024

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	1	1		4		1	1		7	1	1
Traffic Volume (vph)	79	2	154	12	6	18	44	348	4	7	699	57
Future Volume (vph)	79	2	154	12	6	18	44	348	4	7	699	57
Satd. Flow (prot)	1770	1863	1583	0	1708	0	1770	1859	0	1770	1863	1583
Flt Permitted	0.731				0.914		0.265			0.533		
Satd. Flow (perm)	1362	1863	1583	0	1587	0	494	1859	0	993	1863	1583
Satd. Flow (RTOR)			167		20			2				62
Lane Group Flow (vph)	86	2	167	0	40	0	48	382	0	8	760	62
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Total Split (s)	20.0	20.0	20.0	20.0	20.0		40.0	40.0		40.0	40.0	40.0
Total Lost Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Act Effct Green (s)	10.7	10.7	10.7		10.7		28.2	28.2		28.2	28.2	28.2
Actuated g/C Ratio	0.25	0.25	0.25		0.25		0.65	0.65		0.65	0.65	0.65
v/c Ratio	0.26	0.00	0.32		0.10		0.15	0.32		0.01	0.63	0.06
Control Delay (s/veh)	18.4	16.5	5.9		11.9		6.0	5.8		4.1	9.5	1.6
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay (s/veh)	18.4	16.5	5.9		11.9		6.0	5.8		4.1	9.5	1.6
LOS	В	В	А		В		А	А		А	A	A
Approach Delay (s/veh)		10.2			11.9			5.8			8.8	
Approach LOS		В			В			А			А	
Queue Length 50th (ft)	16	0	0		4		5	43		1	116	0
Queue Length 95th (ft)	58	5	39		26		18	89		5	237	10
Internal Link Dist (ft)		669			734			527			1522	
Turn Bay Length (ft)	180						300			265		390
Base Capacity (vph)	502	686	689		597		414	1558		832	1562	1337
Starvation Cap Reductn	0	0	0		0		0	0		0	0	0
Spillback Cap Reductn	0	0	0		0		0	0		0	0	0
Storage Cap Reductn	0	0	0		0		0	0		0	0	0
Reduced v/c Ratio	0.17	0.00	0.24		0.07		0.12	0.25		0.01	0.49	0.05
Intersection Summary												
Cycle Length: 60												
Actuated Cycle Length: 43.4												
Control Type: Actuated-Unco	pordinated											
Maximum v/c Ratio: 0.63												
Intersection Signal Delay (s/	veh): 8.3			Ir	itersection	1 LOS: A	•					
Intersection Capacity Utilizat	ion 65.9%				CU Level (of Service	C					
Analysis Period (min) 15												

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

★↑ _{Ø2}	♣ ø4
40 s	20 s
↓ Ø6	★ Ø8
40 s	20 s

Horizon Year (2035) Buildout Conditions with Mitigations AM Peak

Lanes, Volumes, TimingsHorizon Year (2035) Buildout Conditions with Mitigations1: Universe Blvd. & Woodmont Ave./Woodmont Ave. Extension05/30/2024

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	۲		4		1	t,		2	1	1
Traffic Volume (vph)	139	7	108	8	4	13	117	622	14	21	413	100
Future Volume (vph)	139	7	108	8	4	13	117	622	14	21	413	100
Satd. Flow (prot)	1770	1863	1583	0	1703	0	1770	1857	0	1770	1863	1583
Flt Permitted	0.736				0.937		0.393			0.193		
Satd. Flow (perm)	1371	1863	1583	0	1620	0	732	1857	0	360	1863	1583
Satd. Flow (RTOR)			140		17			3				130
Lane Group Flow (vph)	181	9	140	0	32	0	152	826	0	27	536	130
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Total Split (s)	20.0	20.0	20.0	20.0	20.0		40.0	40.0		40.0	40.0	40.0
Total Lost Time (s)	4.5	4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Act Effct Green (s)	12.5	12.5	12.5		12.5		30.1	30.1		30.1	30.1	30.1
Actuated g/C Ratio	0.24	0.24	0.24		0.24		0.58	0.58		0.58	0.58	0.58
v/c Ratio	0.55	0.02	0.29		0.08		0.36	0.76		0.13	0.49	0.13
Control Delay (s/veh)	25.1	16.6	5.8		12.0		9.0	14.3		7.1	8.5	1.6
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay (s/veh)	25.1	16.6	5.8		12.0		9.0	14.3		7.1	8.5	1.6
LOS	С	В	А		В		А	В		А	А	A
Approach Delay (s/veh)		16.7			12.0			13.5			7.2	
Approach LOS		В			В			В			А	
Queue Length 50th (ft)	46	2	0		3		20	154		3	78	0
Queue Length 95th (ft)	90	10	24		18		45	233		12	126	11
Internal Link Dist (ft)		669			734			527			1522	
Turn Bay Length (ft)	180						300			265		390
Base Capacity (vph)	419	570	581		507		529	1344		260	1348	1181
Starvation Cap Reductn	0	0	0		0		0	0		0	0	0
Spillback Cap Reductn	0	0	0		0		0	0		0	0	0
Storage Cap Reductn	0	0	0		0		0	0		0	0	0
Reduced v/c Ratio	0.43	0.02	0.24		0.06		0.29	0.61		0.10	0.40	0.11
Intersection Summary												
Cycle Length: 60												
Actuated Cycle Length: 51.8												
Control Type: Actuated-Unco	ordinated											
Maximum v/c Ratio: 0.76												
Intersection Signal Delay (s/	/eh): 11.8			In	tersection	n LOS: B						
Intersection Capacity Utilizat	ion 71.7%			IC	CU Level of	of Service	C					
Analysis Period (min) 15												

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

★↑ Ø2	♣ ø4
40 s	20 s
↓ Ø6	₩ Ø8
40 s	20 s

Horizon Year (2035) Buildout Conditions with Mitigations PM Peak