


Traffic Impact Study

The Enclave of Medina Medina, MN

I hereby certify that this report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

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License No. 40936

Date: April 13, 2010

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1. Introduction and Summary

a. Purpose of Report and Study Objectives

Lennar Corporation is proposing development of 182 home sites east of Hunter Drive between Medina Road and Hamel Road in Medina, MN. This property is currently occupied by a farmstead.

The purpose of this report is to determine if the new development will significantly impact the adjacent transportation system in the near term and to recommend mitigation measures if necessary. The study objectives are:

- i. Document how the adjacent existing transportation system operates.
- ii. Analyze how the adjacent transportation system will operate in 2016 if there is no development.
- iii. Analyze how the adjacent transportation system will operate in 2016 with full development of the site.
- iv. Recommend improvements if needed.

b. Executive Summary

The proposed subdivision is proposed to contain 140 single family homes and 42 row townhomes. The entire development is anticipated to be occupied by 2016 for purposes of the analysis contained in this study. The development is proposed to have two access points on Hunter Drive. The northerly public street connection will add a fourth leg to the tee intersection of Hunter Drive and Elm Creek Drive. The southerly public street connection will add a fourth leg to the tee intersection of Hunter Drive and the park driveway. These proposed intersections plus the Hunter Drive/Navajo Road intersection will be analyzed in this study. The scope of this traffic study follows the guidelines in the Institute of Transportation Engineers' recommended practice *Transportation Impact Analyses for Site Development* for a development generating less than 200 peak hour trips.

The principal findings of this study are:

- i. The study intersections will operate acceptably at Level of Service A in all study scenarios with little or no delay.
- ii. Very little stacking is expected at the study intersections in any of the study scenarios, so no turn lanes are necessary at the site's proposed intersections.
- iii. The proposed roadways should be stop sign controlled at their intersections with Hunter Drive and Hunter Drive should remain free flowing.

2. Proposed Development

a. Site Location

The site is located immediately east of Hunter Drive between Hamel Road and Medina Road in Medina, MN (see Figure 2.1).

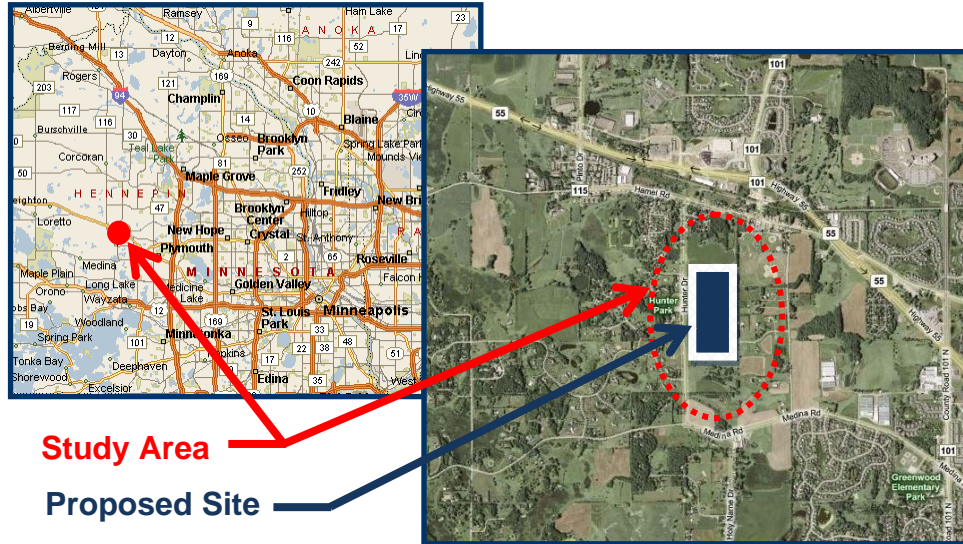


Figure 2.1 – Location Map

b. Land Use and Intensity

The proposed site is currently occupied by a farmstead. The subdivision is proposed to contain 140 single family homes and 42 row townhomes when it is built out.

c. Site Plan

See Figure 2.2 for the proposed site plan.

d. Development Phasing and Timing

For purposes of this study, it is assumed the full development will be built and occupied by 2016.

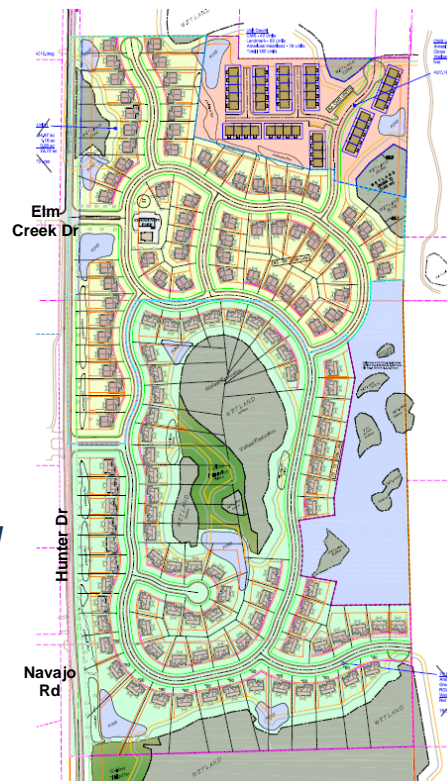


Figure 2.2 – Site Plan

3. Analysis of Existing Conditions

a. Transportation Network Characteristics

Elm Creek Drive, Navajo Road, and Hunter Drive are all paved, two lane city streets. Elm Creek Drive and Navajo Road are classified as local streets and they both have 30 mph speed limits. Hunter Drive is classified as a minor collector in the City of Medina's *Transportation Plan*. It has a 30 mph speed limit north of Elm Creek Drive and a 40 mph speed limit south of Elm Creek Drive. No turn lanes are provided at any Hunter Drive intersection within Medina.

Existing traffic control, speed limits, and travel lanes are shown on Figure 3.1 for each study intersection.

There are no mass transit facilities near the site that will impact the amount of traffic generated by the proposed site. Trails are provided sporadically along the west side of Hunter Drive, but a continuous trail system doesn't exist.

b. Traffic Volumes

A.M. and p.m. peak hour turning movement counts were collected at the existing study intersections in January, 2010 and are shown at the end of this section in Figure 3.2. The turning movement count data is contained in fifteen minute intervals in the Appendix. There wasn't an event at the park during the data collection period, so turning movement volumes have been estimated for a peak event at the ball field. The 150 foot by 120 foot unpainted lot is estimated to hold a maximum of 45 vehicles. The turning movements shown in Figure 3.2 are based on a 90%/10% split of traffic in the peak hour (90% in/10% out in a.m. and 10% in/90% out in p.m.) with 60% destined to/from the south and 40% destined to from the north (the same trip distribution assumed for the traffic forecasts discussed later in this study).

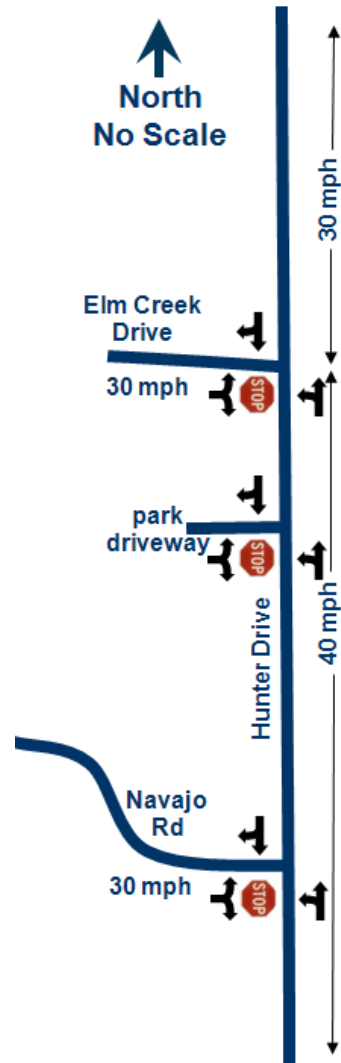


Figure 3.1 – Existing Conditions

c. Level of Service



Source: City of San Jose, CA

An intersection capacity analysis was conducted for the existing intersections per the *Highway Capacity Manual*. Intersections are assigned a “Level of Service” letter grade for the peak hour of traffic based on the number of lanes at the intersection, traffic volumes, and traffic control. Level of Service A (LOS A) represents light traffic flow (free flow conditions) while Level of Service F (LOS F) represents heavy traffic flow (over capacity conditions). LOS D at intersections is typically considered acceptable in the Twin Cities region. Individual movements are also assigned LOS grades. One or more individual movements typically operate at LOS F when the overall intersection is operating acceptably at LOS D. The pictures on the left represent some of the LOS grades (from a signal controlled intersection in San Jose, CA). These LOS grades represent the overall intersection operation, not individual movements.

The LOS results for the existing study hours are shown in Table 3.1. These are based on the existing traffic control and lane configurations as shown in Figure 3.1. The existing turning movement volumes from Figure 3.2 were used in the LOS calculations. The LOS calculations were done using SYNCHRO™ software. The complete LOS calculations, which include grades for individual movements, are included in the Appendix. The study intersections operate acceptably at LOS A with each approach operating at LOS A.

All study intersections currently operate acceptably.

Table 3.1 – Existing Peak Hour Level of Service (LOS)¹

Intersection	A.M. Peak	P.M. Peak
Hunter Dr/Elm Creek Dr	A (a)	A (a)
Hunter Dr/park driveway	A (a)	A (a)
Hunter Dr/Navajo Rd	A (a)	A (a)

¹The first letter is the Level of Service for the intersection. The second letter (in parentheses) is the Level of Service for the worst operating approach.

There is no daily traffic volume data available for Hunter Drive in Medina. Based on Mn/DOT data for the Twin Cities region, the daily traffic volume is typically ten times greater than the p.m. peak hour volume using the roadway. Using this approximation, the daily traffic volume using Hunter Drive is estimated to be 1,400 vehicles per day.

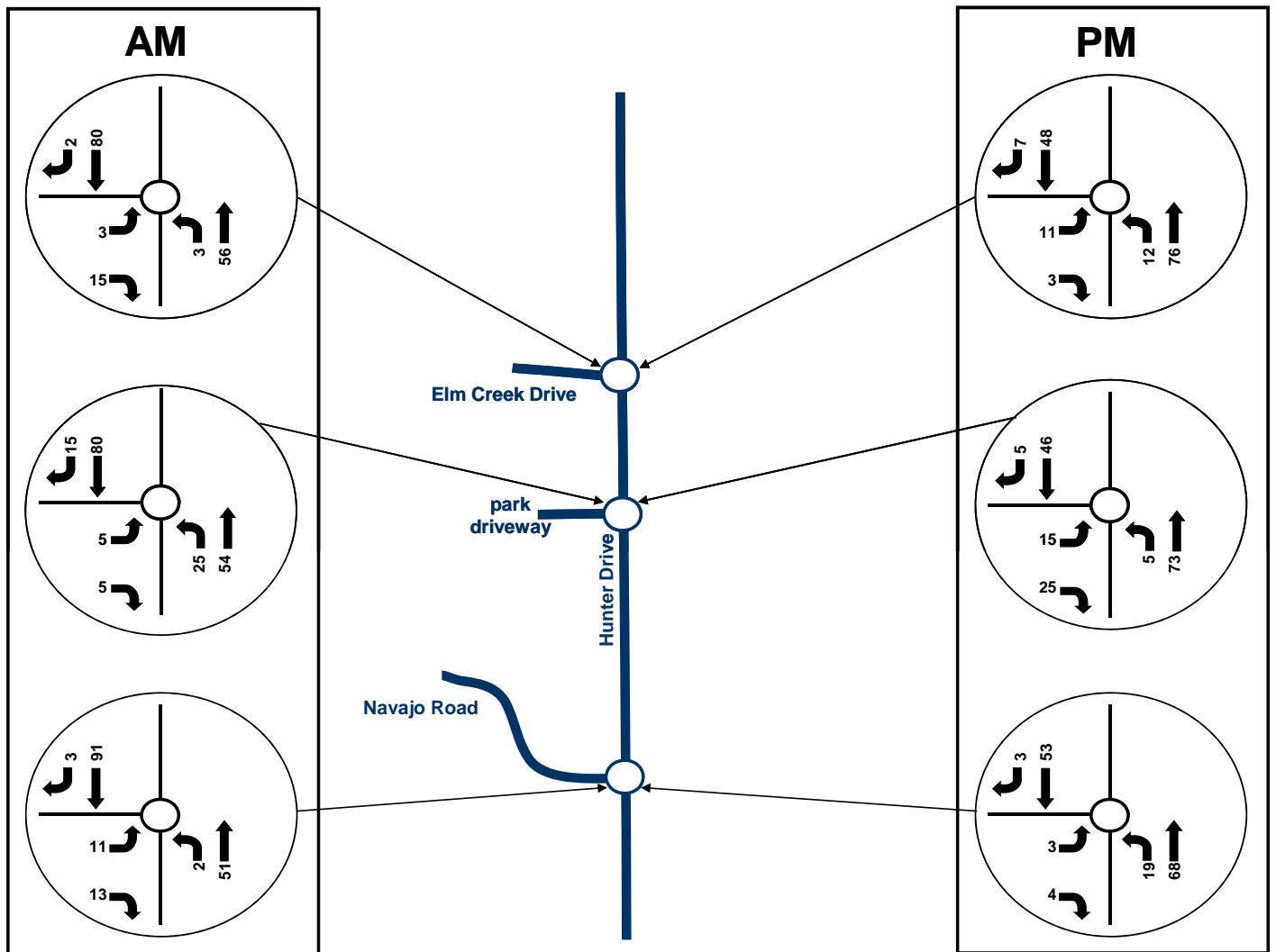
Based on calculations from the *Highway Capacity Manual*, the capacity of a two lane roadway, such as Hunter Drive, is approximately 11,000 vehicles per day. Hunter Drive operates at approximately 15% of its capacity.

d. Data Sources

The sources for the data cited above are:

- Turning movement counts – Traffic Data Inc.
- Roadway geometrics and traffic control – Spack Consulting
- Site Plan – Prepared by Sathre Bergquist for Lennar Corporation

Figure 3.2 - Existing AM & PM Peak Hour Traffic Volumes



4. Projected Traffic

a. Site Traffic Forecasting

A trip generation analysis was performed for the site based on the methods and rates published in the *ITE Trip Generation Manual, 8th Edition*. The resultant trip generation is shown in Table 4.1.

Based on the existing turning movement volumes shown in Figure 3.2, it is expected 60% of the development's traffic will be distributed to/from the south on Hunter Drive and 40% will be distributed to/from the north on Hunter Drive. The traffic generated by the site development was assigned to the area roadways per this distribution pattern. The traffic volumes added to the study roadways through this process are shown in Figure 4.1.

b. Non-site Traffic Forecasting

Traffic forecasts were developed for the year 2016 No-Build scenario by applying a 0.48% compounded annual growth rate to the existing traffic volume data. This growth rate is based on the 20 year growth factor of 1.1 the Mn/DOT State Aid office has assigned to Hennepin County. The Mn/DOT traffic flow maps for this region of Medina were reviewed to confirm this growth rate is reasonable. In fact, the traffic volumes on Sioux Drive south of Highway 55 and Highway 55 east of Sioux Drive (both northeast of the proposed site) have seen traffic declines since they peaked in 2003 and 2002 respectively. The 0.48% growth rate likely results in a conservative forecast. The No-Build peak hour forecasts are shown in Figure 4.2. Applying this growth rate to the daily volume estimate results in an estimate of 1,450 vehicles per day will drive on Hunter Drive in the 2016 No-Build scenario.

c. Total Traffic

Traffic forecasts were developed for the year 2016 Build scenario by adding the traffic generated by the proposed development, as shown in Figure 4.1, to the 2016 No-Build volumes shown in Figure 4.2. The resultant 2016 Build peak hour forecasts are shown in Figure 4.3. The estimated daily volume for Hunter Drive in the 2016 Build scenario is 2,550 vehicles per day.

Daily Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	DAILY RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family Homes	210	Dwelling Units	140.0	9.57	50%	50%	670	670
Townhomes	230	Dwelling Units	42.0	5.81	50%	50%	122	122
TOTALS							792	792

AM Peak Hour

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	AM RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family Homes	210	Dwelling Units	140.0	0.75	25%	75%	26	79
Townhomes	230	Dwelling Units	42.0	0.44	17%	83%	3	15
TOTALS							29	94

PM Peak Hour

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PM RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family Homes	210	Dwelling Units	140.0	1.01	63%	37%	89	52
Townhomes	230	Dwelling Units	42.0	0.52	67%	33%	15	7
TOTALS							104	59

NOTES:

1. All trip generation rates based on "Trip Generation", Institute of Transportation Engineers, 8th Edition.
2. A.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 7 and 9 a.m.).
3. P.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 4 and 6 p.m.).

Figure 4.1 - AM & PM Peak Hour Traffic Volumes Due to Development

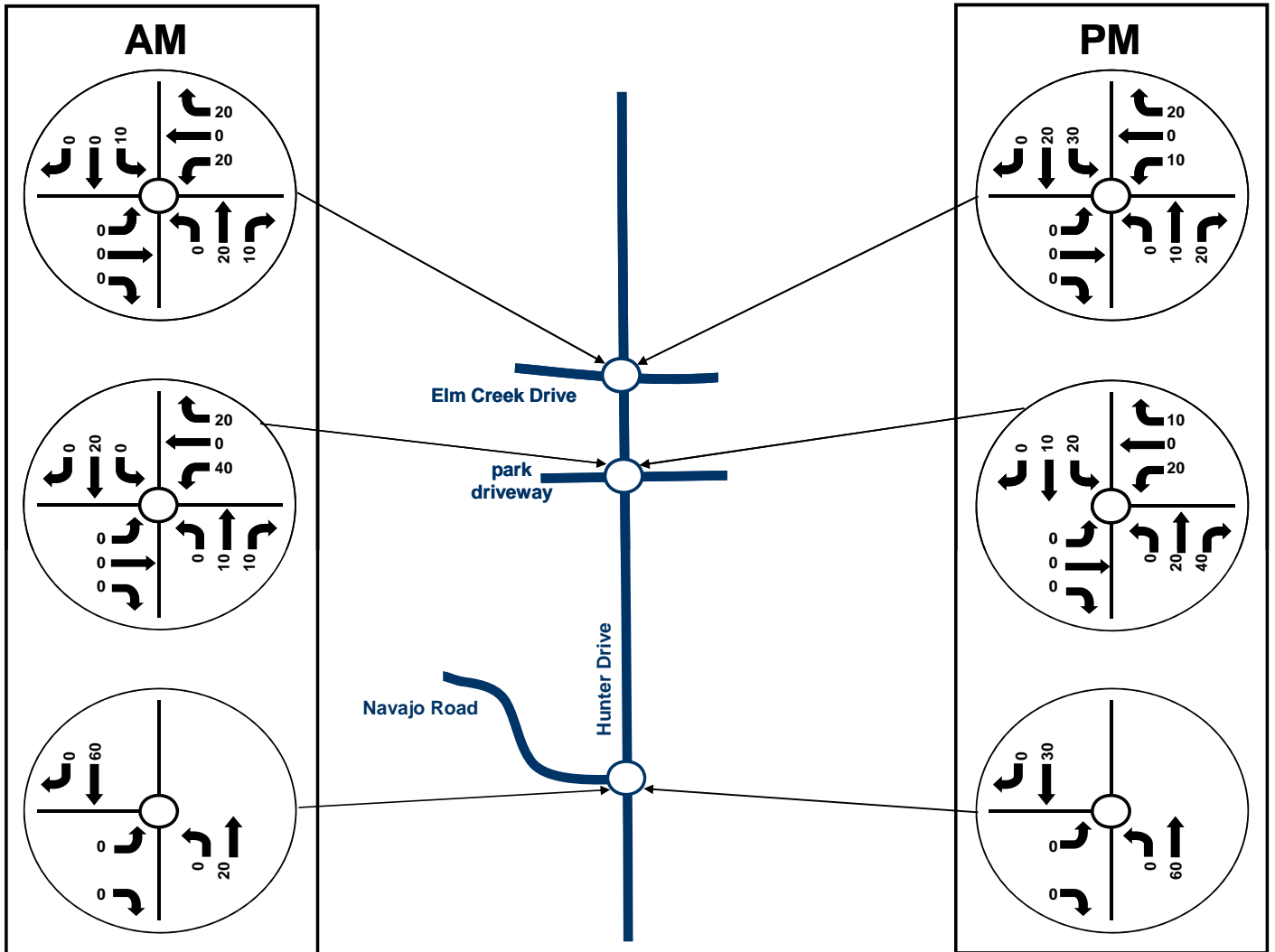
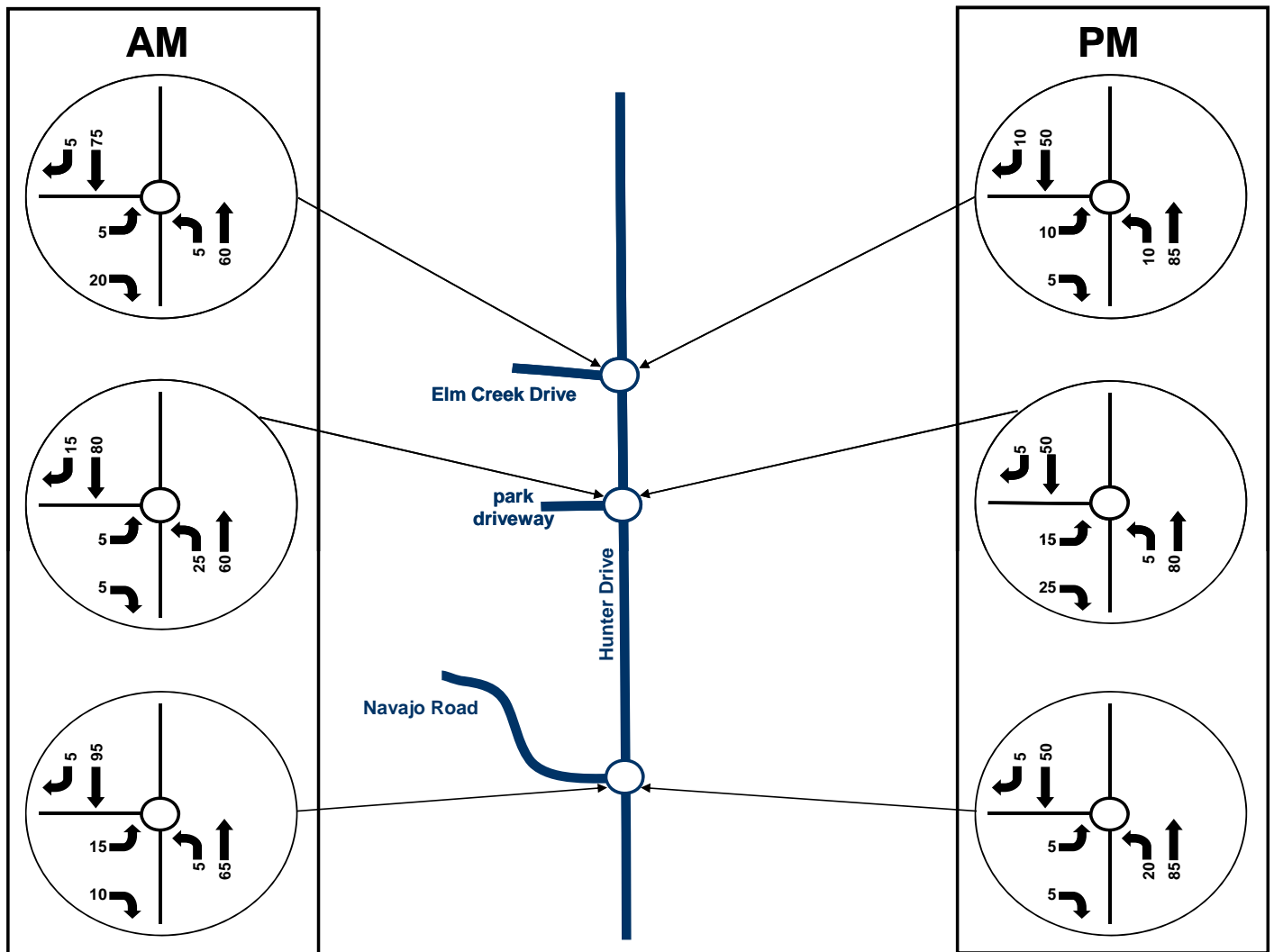
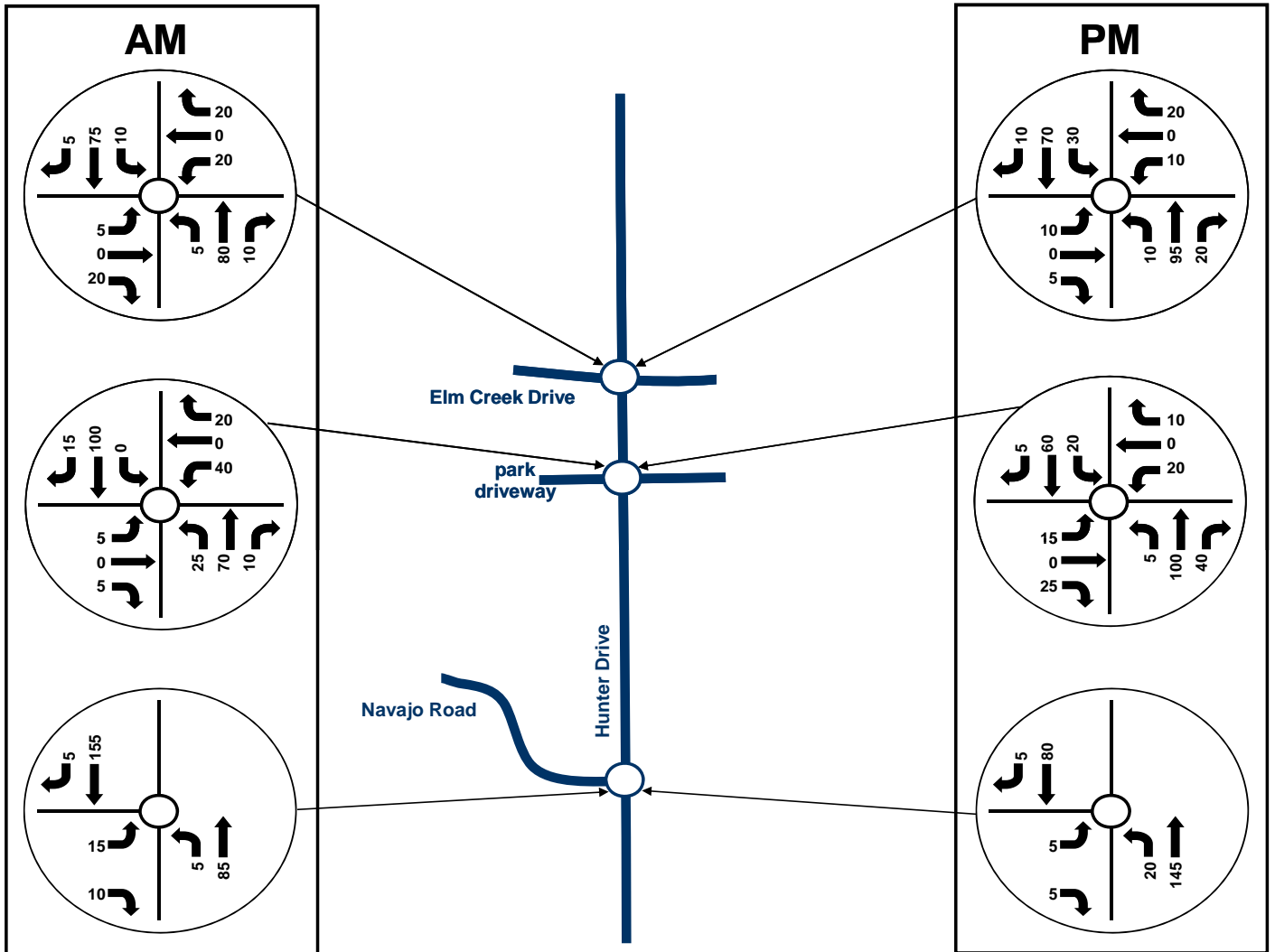


Figure 4.2 - 2016 AM & PM Peak Hour No-Build Traffic Volumes



**Figure 4.3 - 2016 AM & PM
Peak Hour Build Traffic Volumes**



5. Traffic and Improvement Analysis

a. Site Access

Access to the site is shown on the site plan in Figure 2.2. The development will be served by two public street intersections on Hunter Drive. Both proposed accesses add a fourth leg to already existing tee intersections. On the north, an easterly leg will be added to the existing Hunter Drive/Elm Creek Drive tee intersection. On the south, an easterly leg will be added to the existing Hunter Drive/park driveway tee intersection.

The outbound movements from the development to Hunter Drive will be stop sign controlled with Hunter Drive remaining free flowing. No turn lanes are proposed at either access. Clear sight lines will be provided at each intersection.

b. Level of Service Analysis

The LOS results for the 2016 scenario study hours are shown in Table 5.1. These are based on the existing traffic control and lane configurations as shown in Figure 3.1 for the existing intersections plus the proposed development access configuration described in the previous section. No improvements are programmed at any of the existing study intersections.

The forecast turning movement volumes from Figures 4.2 and 4.3 were used in the LOS calculations. The LOS calculations were done using SYNCHRO™ software. The complete LOS calculations, which include grades for individual movements, are included in the Appendix.

Table 5.1 – 2016 Level of Service (LOS)¹

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	No-Build	Build	No-Build	Build
Hunter Dr/Elm Creek Dr	A (a)	A (a)	A (a)	A (b)
Hunter Dr/park driveway	A (a)	A (b)	A (a)	A (b)
Hunter Dr/Navajo Rd	A (a)	A (a)	A (a)	A (a)

¹The first letter is the Level of Service for the intersection. The second letter (in parentheses) is the Level of Service for the worst operating approach.

All of the study intersections will operate acceptably at LOS A with each approach operating at LOS B or better. Furthermore, the 2,550 vehicles per day forecast to be using Hunter Drive in the 2016 Build scenario will only be using 25% of its 11,000 vehicle per day capacity.

All of the intersections will operate acceptably as proposed.

6. Conclusions and Recommendations

All of the study intersections will operate acceptably at LOS A with each approach operating at LOS B or better. The study intersections will experience very little stacking and should provide safe ingress/egress if adequate sight lines are maintained. No turn lanes or other mitigation measures are necessary to accommodate the traffic generated by the site. It is recommended the development's proposed approaches to Hunter Drive should be stop sign controlled while the Hunter Drive should remain free flowing.

7. Appendix

A. Traffic counts

B. Capacity analysis backup

Appendix A - Traffic Counts

Traffic Data Inc.

3268 Xenwood Avenue South
St Louis Park, MN 55416

File Name : 2461011-Hunter Dr & Elm Creek Dr - AM

Site Code : 02461011

Start Date : 1/14/2010

Page No : 1

Hunter Dr & Elm Creek Dr - AM
Medina, MN

Groups Printed- Unshifted

Start Time	Hunter Drive Southbound					Westbound					Hunter Drive Northbound					Elm Creek Drive Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	0	5	0	0	5	0	0	0	0	0	0	3	0	0	3	3	0	1	0	4	12
06:45 AM	0	3	0	0	3	0	0	0	0	0	0	10	0	0	10	1	0	0	0	1	14
Total	0	8	0	0	8	0	0	0	0	0	0	13	0	0	13	4	0	1	0	5	26
07:00 AM	0	14	0	0	14	0	0	0	0	0	0	12	0	0	12	4	0	0	0	4	30
07:15 AM	0	21	0	0	21	0	0	0	0	0	0	15	1	0	16	5	0	1	0	6	43
07:30 AM	2	29	0	0	31	0	0	0	0	0	0	9	1	0	10	5	0	0	0	5	46
07:45 AM	0	14	0	0	14	0	0	0	0	0	0	16	1	0	17	1	0	1	0	2	33
Total	2	78	0	0	80	0	0	0	0	0	0	52	3	0	55	15	0	2	0	17	152
08:00 AM	0	16	0	0	16	0	0	0	0	0	0	16	0	0	16	4	0	1	0	5	37
08:15 AM	2	9	0	0	11	0	0	0	0	0	0	10	0	0	10	1	0	1	0	2	23
Grand Total	4	111	0	0	115	0	0	0	0	0	0	91	3	0	94	24	0	5	0	29	238
Apprch %	3.5	96.5	0	0		0	0	0	0		0	96.8	3.2	0		82.8	0	17.2	0		
Total %	1.7	46.6	0	0	48.3	0	0	0	0	0	0	38.2	1.3	0	39.5	10.1	0	2.1	0	12.2	

Start Time	Hunter Drive Southbound					Westbound					Hunter Drive Northbound					Elm Creek Drive Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	21	0	0	21	0	0	0	0	0	0	15	1	0	16	5	0	1	0	6	43
07:30 AM	2	29	0	0	31	0	0	0	0	0	0	9	1	0	10	5	0	0	0	5	46
07:45 AM	0	14	0	0	14	0	0	0	0	0	0	16	1	0	17	1	0	1	0	2	33
08:00 AM	0	16	0	0	16	0	0	0	0	0	0	16	0	0	16	4	0	1	0	5	37
Total Volume	2	80	0	0	82	0	0	0	0	0	0	56	3	0	59	15	0	3	0	18	159
% App. Total	2.4	97.6	0	0		0	0	0	0		0	94.9	5.1	0		83.3	0	16.7	0		
PHF	.250	.690	.000	.000	.661	.000	.000	.000	.000	.000	.000	.875	.750	.000	.868	.750	.000	.750	.000	.750	.864

Appendix A - Traffic Counts

Traffic Data Inc.

3268 Xenwood Avenue South
St Louis Park, MN 55416

File Name : 2461012-Hunter Dr & Navajo Rd - AM

Site Code : 02461012

Start Date : 1/14/2010

Page No : 1

Hunter Dr & Navajo Rd - AM
Medina, MN

Groups Printed- Unshifted

Start Time	Hunter Drive Southbound					Westbound					Hunter Drive Northbound					Navajo Road Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30 AM	1	8	0	0	9	0	0	0	0	0	0	2	0	0	2	1	0	1	0	2	13
06:45 AM	1	4	0	0	5	0	0	0	0	0	0	9	0	0	9	3	0	1	0	4	18
Total	2	12	0	0	14	0	0	0	0	0	0	11	0	0	11	4	0	2	0	6	31
07:00 AM	3	14	0	0	17	0	0	0	0	0	0	9	1	0	10	7	0	4	0	11	38
07:15 AM	0	27	0	0	27	0	0	0	0	0	0	9	1	0	10	2	0	5	0	7	44
07:30 AM	3	31	0	0	34	0	0	0	0	0	0	10	0	0	10	3	0	3	0	6	50
07:45 AM	0	16	0	0	16	0	0	0	0	0	0	19	1	0	20	2	0	2	0	4	40
Total	6	88	0	0	94	0	0	0	0	0	0	47	3	0	50	14	0	14	0	28	172
08:00 AM	0	17	0	0	17	0	0	0	0	0	0	13	0	0	13	6	0	1	0	7	37
08:15 AM	0	11	0	0	11	0	0	0	0	0	0	10	1	0	11	4	0	0	0	4	26
Grand Total	8	128	0	0	136	0	0	0	0	0	0	81	4	0	85	28	0	17	0	45	266
Apprch %	5.9	94.1	0	0		0	0	0	0		0	95.3	4.7	0		62.2	0	37.8	0		
Total %	3	48.1	0	0	51.1	0	0	0	0	0	0	30.5	1.5	0	32	10.5	0	6.4	0	16.9	

Start Time	Hunter Drive Southbound					Westbound					Hunter Drive Northbound					Navajo Road Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 06:30 AM to 08:15 AM - Peak 1 of 1																					
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07:00 AM	3	14	0	0	17	0	0	0	0	0	0	9	1	0	10	7	0	4	0	11	38
07:15 AM	0	27	0	0	27	0	0	0	0	0	0	9	1	0	10	2	0	5	0	7	44
07:30 AM	3	31	0	0	34	0	0	0	0	0	0	10	0	0	10	3	0	3	0	6	50
07:45 AM	0	16	0	0	16	0	0	0	0	0	0	19	1	0	20	2	0	2	0	4	40
Total Volume	6	88	0	0	94	0	0	0	0	0	0	47	3	0	50	14	0	14	0	28	172
% App. Total	6.4	93.6	0	0		0	0	0	0		0	94	6	0		50	0	50	0		
PHF	.500	.710	.000	.000	.691	.000	.000	.000	.000	.000	.000	.618	.750	.000	.625	.500	.000	.700	.000	.636	.860

Appendix A - Traffic Counts

Traffic Data Inc.

3268 Xenwood Avenue South
St Louis Park, MN 55416

File Name : 2461011-Hunter Dr & Elm Creek Dr - PM

Site Code : 02461011

Start Date : 1/13/2010

Page No : 1

Hunter Dr & Elm Creek Dr - PM
Medina, MN

Groups Printed- Unshifted

Start Time	Hunter Drive Southbound					Westbound					Hunter Drive Northbound					Elm Creek Drive Eastbound					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0			
04:00 PM	1	11	0	0	12	0	0	0	0	0	0	11	2	0	13	0	0	0	0	0	0	25
04:15 PM	1	4	0	0	5	0	0	0	0	0	0	18	3	0	21	1	0	1	0	2	2	28
04:30 PM	0	18	0	0	18	0	0	0	0	0	0	13	2	0	15	1	0	0	0	1	34	34
04:45 PM	0	4	0	0	4	0	0	0	0	0	0	26	5	0	31	1	0	1	0	2	37	37
Total	2	37	0	0	39	0	0	0	0	0	0	68	12	0	80	3	0	2	0	5	124	124
05:00 PM	1	13	0	0	14	0	0	0	0	0	0	16	4	0	20	1	0	1	0	2	36	36
05:15 PM	2	18	0	0	20	0	0	0	0	0	0	13	8	0	21	1	0	1	0	2	43	43
05:30 PM	1	9	0	0	10	0	0	0	0	0	0	12	1	0	13	2	0	1	0	3	26	26
05:45 PM	0	15	0	0	15	0	0	0	0	0	0	12	3	0	15	1	0	1	0	2	32	32
Total	4	55	0	0	59	0	0	0	0	0	0	53	16	0	69	5	0	4	0	9	137	137
Grand Total	6	92	0	0	98	0	0	0	0	0	0	121	28	0	149	8	0	6	0	14	261	261
Apprch %	6.1	93.9	0	0		0	0	0	0		0	81.2	18.8	0		57.1	0	42.9	0			
Total %	2.3	35.2	0	0	37.5	0	0	0	0	0	0	46.4	10.7	0	57.1	3.1	0	2.3	0	5.4		

Start Time	Hunter Drive Southbound					Westbound					Hunter Drive Northbound					Elm Creek Drive Eastbound					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 04:30 PM																						
04:30 PM	0	18	0	0	18	0	0	0	0	0	0	13	2	0	15	1	0	0	0	1	34	34
04:45 PM	0	4	0	0	4	0	0	0	0	0	0	26	5	0	31	1	0	1	0	2	37	37
05:00 PM	1	13	0	0	14	0	0	0	0	0	0	16	4	0	20	1	0	1	0	2	36	36
05:15 PM	2	18	0	0	20	0	0	0	0	0	0	13	8	0	21	1	0	1	0	2	43	43
Total Volume	3	53	0	0	56	0	0	0	0	0	0	68	19	0	87	4	0	3	0	7	150	150
% App. Total	5.4	94.6	0	0		0	0	0	0		0	78.2	21.8	0		57.1	0	42.9	0			
PHF	.375	.736	.000	.000	.700	.000	.000	.000	.000	.000	.000	.654	.594	.000	.702	1.000	.000	.750	.000	.875	.875	.875

Appendix A - Traffic Counts

Traffic Data Inc.

3268 Xenwood Avenue South
St Louis Park, MN 55416

File Name : 2461012-Hunter Dr & Navajo Rd - PM

Site Code : 02461012

Start Date : 1/13/2010

Page No : 1

Hunter Dr & Navajo Rd - PM
Medina, MN

Groups Printed- Unshifted

Start Time	Hunter Drive Southbound					Westbound					Hunter Drive Northbound					Navajo Rd Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
04:00 PM	3	11	0	0	14	0	0	0	0	0	0	12	3	0	15	0	0	3	0	3	32
04:15 PM	1	4	0	0	5	0	0	0	0	0	0	15	1	0	16	3	0	4	0	7	28
04:30 PM	2	16	0	0	18	0	0	0	0	0	0	15	3	0	18	0	0	1	0	1	37
04:45 PM	2	4	0	0	6	0	0	0	0	0	0	26	4	0	30	0	0	4	0	4	40
Total	8	35	0	0	43	0	0	0	0	0	0	68	11	0	79	3	0	12	0	15	137
05:00 PM	2	10	0	0	12	0	0	0	0	0	0	19	4	0	23	0	0	3	0	3	38
05:15 PM	1	18	0	0	19	0	0	0	0	0	0	16	1	0	17	3	0	3	0	6	42
05:30 PM	3	7	0	0	10	0	0	0	0	0	0	10	4	0	14	3	0	3	0	6	30
05:45 PM	2	15	0	0	17	0	0	0	0	0	0	14	5	0	19	1	0	1	0	2	38
Total	8	50	0	0	58	0	0	0	0	0	0	59	14	0	73	7	0	10	0	17	148
Grand Total	16	85	0	0	101	0	0	0	0	0	0	127	25	0	152	10	0	22	0	32	285
Apprch %	15.8	84.2	0	0		0	0	0	0		0	83.6	16.4	0		31.2	0	68.8	0		
Total %	5.6	29.8	0	0	35.4	0	0	0	0	0	0	44.6	8.8	0	53.3	3.5	0	7.7	0	11.2	

Start Time	Hunter Drive Southbound					Westbound					Hunter Drive Northbound					Navajo Rd Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	2	16	0	0	18	0	0	0	0	0	0	15	3	0	18	0	0	1	0	1	37
04:45 PM	2	4	0	0	6	0	0	0	0	0	0	26	4	0	30	0	0	4	0	4	40
05:00 PM	2	10	0	0	12	0	0	0	0	0	0	19	4	0	23	0	0	3	0	3	38
05:15 PM	1	18	0	0	19	0	0	0	0	0	0	16	1	0	17	3	0	3	0	6	42
Total Volume	7	48	0	0	55	0	0	0	0	0	0	76	12	0	88	3	0	11	0	14	157
% App. Total	12.7	87.3	0	0		0	0	0	0		0	86.4	13.6	0		21.4	0	78.6	0		
PHF	.875	.667	.000	.000	.724	.000	.000	.000	.000	.000	.000	.731	.750	.000	.733	.250	.000	.688	.000	.583	.935

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2010 AM Peak Hour
1: Elm Creek Drive & Hunter Drive



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	15	3	56	80	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	16	3	61	87	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	155	88	89			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	155	88	89			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	834	970	1506			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	20	64	89			
Volume Left	3	3	0			
Volume Right	16	0	2			
cSH	945	1506	1700			
Volume to Capacity	0.02	0.00	0.05			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	8.9	0.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.9	0.4	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			15.4%	ICU Level of Service		A
Analysis Period (min)			15			

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2010 AM Peak Hour
2: Navajo Road & Hunter Drive



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	11	13	2	51	91	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	14	2	55	99	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	160	101	102			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	160	101	102			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	829	955	1490			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	26	58	102			
Volume Left	12	2	0			
Volume Right	14	0	3			
cSH	893	1490	1700			
Volume to Capacity	0.03	0.00	0.06			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	9.2	0.3	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.2	0.3	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			15.0%	ICU Level of Service		A
Analysis Period (min)			15			

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2010 AM Peak Hour
3: park dvwy & Hunter Drive



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	5	25	54	80	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	5	27	59	87	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	208	95	103			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	208	95	103			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	98			
cM capacity (veh/h)	766	962	1489			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	11	86	103			
Volume Left	5	27	0			
Volume Right	5	0	16			
cSH	853	1489	1700			
Volume to Capacity	0.01	0.02	0.06			
Queue Length 95th (ft)	1	1	0			
Control Delay (s)	9.3	2.5	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.3	2.5	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization		20.9%		ICU Level of Service		A
Analysis Period (min)			15			

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2010 PM Peak Hour
1: Elm Creek Drive & Hunter Drive



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	11	3	12	76	48	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	3	13	83	52	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	165	56	60			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	165	56	60			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	99			
cM capacity (veh/h)	819	1011	1544			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	15	96	60			
Volume Left	12	13	0			
Volume Right	3	0	8			
cSH	854	1544	1700			
Volume to Capacity	0.02	0.01	0.04			
Queue Length 95th (ft)	1	1	0			
Control Delay (s)	9.3	1.1	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.3	1.1	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization		21.3%		ICU Level of Service		A
Analysis Period (min)			15			

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2010 PM Peak Hour
2: Navajo Road & Hunter Drive



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	3	4	19	68	53	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	4	21	74	58	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	174	59	61			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174	59	61			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	99			
cM capacity (veh/h)	805	1006	1542			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	8	95	61
Volume Left	3	21	0
Volume Right	4	0	3
cSH	909	1542	1700
Volume to Capacity	0.01	0.01	0.04
Queue Length 95th (ft)	1	1	0
Control Delay (s)	9.0	1.7	0.0
Lane LOS	A	A	
Approach Delay (s)	9.0	1.7	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization		21.3%	ICU Level of Service A
Analysis Period (min)		15	

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2010 PM Peak Hour
3: park dvwy & Hunter Drive



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	25	5	73	46	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	27	5	79	50	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	143	53	55			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	143	53	55			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	97	100			
cM capacity (veh/h)	847	1015	1549			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	43	85	55			
Volume Left	16	5	0			
Volume Right	27	0	5			
cSH	945	1549	1700			
Volume to Capacity	0.05	0.00	0.03			
Queue Length 95th (ft)	4	0	0			
Control Delay (s)	9.0	0.5	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.0	0.5	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			17.9%	ICU Level of Service		A
Analysis Period (min)			15			

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2016 AM Peak Hour No Build
1: Elm Creek Drive & Hunter Drive



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	20	5	60	75	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	22	5	65	82	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	160	84	87			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	160	84	87			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	98	100			
cM capacity (veh/h)	828	975	1509			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	27	71	87
Volume Left	5	5	0
Volume Right	22	0	5
cSH	941	1509	1700
Volume to Capacity	0.03	0.00	0.05
Queue Length 95th (ft)	2	0	0
Control Delay (s)	8.9	0.6	0.0
Lane LOS	A	A	
Approach Delay (s)	8.9	0.6	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		17.3%	ICU Level of Service A
Analysis Period (min)		15	

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2016 AM Peak Hour No Build
2: Navajo Road & Hunter Drive



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	10	5	65	95	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	11	5	71	103	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	188	106	109			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	188	106	109			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	799	948	1482			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	27	76	109
Volume Left	16	5	0
Volume Right	11	0	5
cSH	852	1482	1700
Volume to Capacity	0.03	0.00	0.06
Queue Length 95th (ft)	2	0	0
Control Delay (s)	9.4	0.6	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	0.6	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization		17.5%	ICU Level of Service A
Analysis Period (min)		15	

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2016 AM Peak Hour No Build
3: park dvwy & Hunter Drive



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	5	25	60	80	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	5	27	65	87	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	215	95	103			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	215	95	103			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	98			
cM capacity (veh/h)	759	962	1489			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	11	92	103			
Volume Left	5	27	0			
Volume Right	5	0	16			
cSH	849	1489	1700			
Volume to Capacity	0.01	0.02	0.06			
Queue Length 95th (ft)	1	1	0			
Control Delay (s)	9.3	2.3	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.3	2.3	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			21.2%	ICU Level of Service		A
Analysis Period (min)			15			

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2016 PM Peak Hour No Build
1: Elm Creek Drive & Hunter Drive



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	5	10	85	50	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	5	11	92	54	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	174	60	65			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174	60	65			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	810	1006	1537			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	16	103	65			
Volume Left	11	11	0			
Volume Right	5	0	11			
cSH	866	1537	1700			
Volume to Capacity	0.02	0.01	0.04			
Queue Length 95th (ft)	1	1	0			
Control Delay (s)	9.2	0.8	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.2	0.8	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			21.7%	ICU Level of Service		A
Analysis Period (min)			15			

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2016 PM Peak Hour No Build
2: Navajo Road & Hunter Drive



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	5	20	85	50	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	5	22	92	54	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	193	57	60			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	193	57	60			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	785	1009	1544			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	11	114	60			
Volume Left	5	22	0			
Volume Right	5	0	5			
cSH	883	1544	1700			
Volume to Capacity	0.01	0.01	0.04			
Queue Length 95th (ft)	1	1	0			
Control Delay (s)	9.1	1.5	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.1	1.5	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			22.2%	ICU Level of Service		A
Analysis Period (min)			15			

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2016 PM Peak Hour No Build
3: park dvwy & Hunter Drive

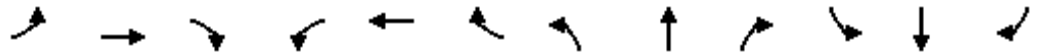


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	25	5	80	50	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	27	5	87	54	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	155	57	60			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	155	57	60			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	97	100			
cM capacity (veh/h)	834	1009	1544			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	43	92	60			
Volume Left	16	5	0			
Volume Right	27	0	5			
cSH	935	1544	1700			
Volume to Capacity	0.05	0.00	0.04			
Queue Length 95th (ft)	4	0	0			
Control Delay (s)	9.0	0.5	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.0	0.5	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			2.2			
Intersection Capacity Utilization		18.3%		ICU Level of Service		A
Analysis Period (min)			15			

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2016 AM Peak Hour Build
1: Elm Creek Drive & Hunter Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	5	0	20	20	0	20	5	80	10	10	75	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	0	22	22	0	22	5	87	11	11	82	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	231	215	84	231	212	92	87			98		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	231	215	84	231	212	92	87			98		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	98	97	100	98	100			99		
cM capacity (veh/h)	702	676	975	702	678	965	1509			1495		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	27	43	103	98
Volume Left	5	22	5	11
Volume Right	22	22	11	5
cSH	905	813	1509	1495
Volume to Capacity	0.03	0.05	0.00	0.01
Queue Length 95th (ft)	2	4	0	1
Control Delay (s)	9.1	9.7	0.4	0.9
Lane LOS	A	A	A	A
Approach Delay (s)	9.1	9.7	0.4	0.9
Approach LOS	A	A		

Intersection Summary			
Average Delay		2.9	
Intersection Capacity Utilization	19.4%		ICU Level of Service A
Analysis Period (min)		15	

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2016 AM Peak Hour Build
2: Navajo Road & Hunter Drive



















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	10	5	85	155	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	11	5	92	168	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	274	171	174			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	274	171	174			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	712	873	1403			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	27	98	174			
Volume Left	16	5	0			
Volume Right	11	0	5			
cSH	769	1403	1700			
Volume to Capacity	0.04	0.00	0.10			
Queue Length 95th (ft)	3	0	0			
Control Delay (s)	9.9	0.5	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.9	0.5	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			18.6%		ICU Level of Service	A
Analysis Period (min)			15			

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2016 AM Peak Hour Build
3: park dvwy & Hunter Drive

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	5	40	0	20	25	70	10	0	100	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	0	5	43	0	22	27	76	11	0	109	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	274	258	117	258	261	82	125			87		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	274	258	117	258	261	82	125			87		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	99	94	100	98	98			100		
cM capacity (veh/h)	653	634	935	681	632	978	1462			1509		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	11	65	114	125								
Volume Left	5	43	27	0								
Volume Right	5	22	11	16								
cSH	769	758	1462	1509								
Volume to Capacity	0.01	0.09	0.02	0.00								
Queue Length 95th (ft)	1	7	1	0								
Control Delay (s)	9.7	10.2	1.9	0.0								
Lane LOS	A	B	A									
Approach Delay (s)	9.7	10.2	1.9	0.0								
Approach LOS	A	B										
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			23.9%		ICU Level of Service				A			
Analysis Period (min)			15									

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2016 PM Peak Hour Build
1: Elm Creek Drive & Hunter Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Volume (veh/h)	10	0	5	10	0	20	10	95	20	30	70	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	0	5	11	0	22	11	103	22	33	76	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	304	293	82	288	288	114	87			125		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304	293	82	288	288	114	87			125		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	98	100	98	99			98		
cM capacity (veh/h)	619	599	978	646	604	938	1509			1462		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	16	33	136	120
Volume Left	11	11	11	33
Volume Right	5	22	22	11
cSH	705	815	1509	1462
Volume to Capacity	0.02	0.04	0.01	0.02
Queue Length 95th (ft)	2	3	1	2
Control Delay (s)	10.2	9.6	0.6	2.2
Lane LOS	B	A	A	A
Approach Delay (s)	10.2	9.6	0.6	2.2
Approach LOS	B	A		

Intersection Summary			
Average Delay		2.7	
Intersection Capacity Utilization	22.6%		ICU Level of Service A
Analysis Period (min)	15		

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2016 PM Peak Hour Build
2: Navajo Road & Hunter Drive



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	5	20	145	80	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	5	22	158	87	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	291	90	92			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	291	90	92			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	690	968	1502			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	11	179	92			
Volume Left	5	22	0			
Volume Right	5	0	5			
cSH	806	1502	1700			
Volume to Capacity	0.01	0.01	0.05			
Queue Length 95th (ft)	1	1	0			
Control Delay (s)	9.5	1.0	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.5	1.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			25.4%	ICU Level of Service		A
Analysis Period (min)			15			

Appendix B - Capacity Analysis Backup

HCM Unsignalized Intersection Capacity Analysis
The Enclave of Medina

2016 PM Peak Hour Build
3: park dvwy & Hunter Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	15	0	25	20	0	10	5	100	40	20	60	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	0	27	22	0	11	5	109	43	22	65	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	264	274	68	280	255	130	71			152		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	264	274	68	280	255	130	71			152		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	97	97	100	99	100			98		
cM capacity (veh/h)	671	621	995	645	636	919	1530			1429		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	43	33	158	92
Volume Left	16	22	5	22
Volume Right	27	11	43	5
cSH	843	716	1530	1429
Volume to Capacity	0.05	0.05	0.00	0.02
Queue Length 95th (ft)	4	4	0	1
Control Delay (s)	9.5	10.3	0.3	1.9
Lane LOS	A	B	A	A
Approach Delay (s)	9.5	10.3	0.3	1.9
Approach LOS	A	B		

Intersection Summary			
Average Delay		3.0	
Intersection Capacity Utilization	23.0%		ICU Level of Service A
Analysis Period (min)		15	