

SUNNYSIDE LANDING TRAFFIC IMPACT STUDY

PREPARED FOR:

**CENIZO VENTURES, LLC
SUNNYSIDE LAKE LAND HOLDING, LLC
114 SLEEPY HOLLOW ROAD
LEESBURG, FLORIDA 34748**

PREPARED BY:

**GRIFFEY ENGINEERING, INC.
36202 EAST ELDORADO LAKE DRIVE
EUSTIS, FLORIDA 32736**

OCTOBER 2019

PROFESSIONAL ENGINEERING CERTIFICATION

I hereby certify that I am a Professional Engineer properly registered in the State of Florida practicing with Griffey Engineering, Inc., a corporation authorized to operate as an engineering business, CA # 8082, by the State of Florida Department of Professional Regulation, Board of Professional Engineers, and that I have prepared or approved the evaluations, findings, opinions, conclusion, or technical advice attached hereto for:

PROJECT: Sunnyside Landing

**LOCATION: Sunnyside Drive
Leesburg**

**CLIENT: Cenizo Ventures, LLC
Sunnyside Lake Land Holding, LLC**

I hereby acknowledge that the procedures and references used to develop the results contained in these computations are standard to the professional practice of transportation engineering as applied through professional judgment and experience.

NAME: Donald A. Griffey, P.E.

P.E. No.: Florida P.E. # 36799

SIGNATURE:

This item has been digitally signed and sealed by Donald A. Griffey, P.E.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

SUNNYSIDE LANDING TRAFFIC IMPACT STUDY

TABLE OF CONTENTS

INTRODUCTION	1
STUDY AREA.....	3
PLANNED & PROGRAMMED IMPROVEMENTS	5
COMMITTED DEVELOPMENT	5
EXISTING CONDITIONS.....	5
TRIP GENERATION	7
TRIP DISTRIBUTION	8
FUTURE BACKGROUND TRAFFIC	9
FUTURE ANALYSIS.....	9
MITIGATION ANALYSIS.....	11
CONCLUSIONS & RECOMMENDATIONS	12
APPENDIX A: METHODOLOGY	
APPENDIX B: GROWTH CALCULATIONS	
APPENDIX C: TRAFFIC COUNTS & CURRENT INTERSECTION ANALYSIS	
APPENDIX D: FUTURE INTERSECTION ANALYSIS	

SUNNYSIDE LANDING TRAFFIC IMPACT STUDY

LIST OF FIGURES

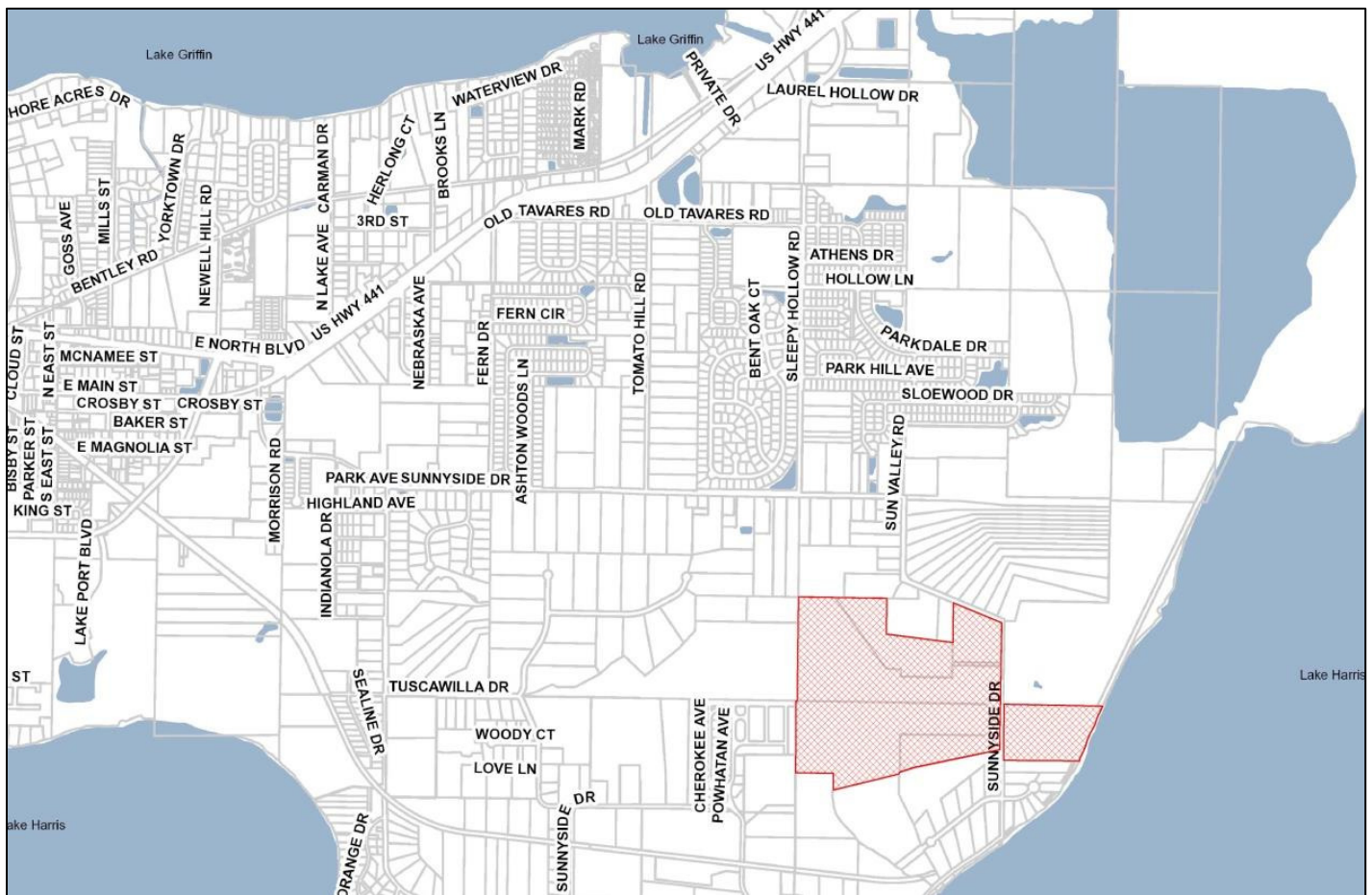
• Figure 1 - Vicinity Map	1
• Figure 2 – Aerial Map	2
• Figure 3 – Site Plan	2
• Figure 4 – Study Area	3
• Figure 5 - Project Trip Distribution	8
• Figure 6 - Future Turning Movements.....	10

LIST OF TABLES

• Table 1 – Road Segments within Study Area	4
• Table 2 – Studied TMS segments.....	5
• Table 3 – Studied Intersections.....	5
• Table 4 – Planned & Programmed Improvements	5
• Table 5 – Road Capacities	6
• Table 6 – 2018 Traffic Volumes	6
• Table 7 – Existing Intersection Level of Service (LOS).....	6
• Table 8 – ITE Trip Rate	7
• Table 9 – Proposed Trip Generation Volumes.....	7
• Table 10 – Net New Trips.....	7
• Table 11 – Future 2024 Road Volumes & Capacity	9
• Table 12 – Future 2024 Road Volumes & Capacity with Project Traffic.....	9
• Table 13 – Future 2024 Intersection LOS (with Project Traffic).....	11
• Table 14 – Existing Intersection LOS.....	11
• Table 15 – Future 2024 Intersection LOS (without Project Traffic).....	11
• Table 16 – Existing Intersection LOS (with improvement).....	12
• Table 17 – Future 2024 Intersection LOS (with Improvement).....	12
• Table 18 – Future 2024 Intersection LOS (with Improvement + Project Traffic)	12

INTRODUCTION

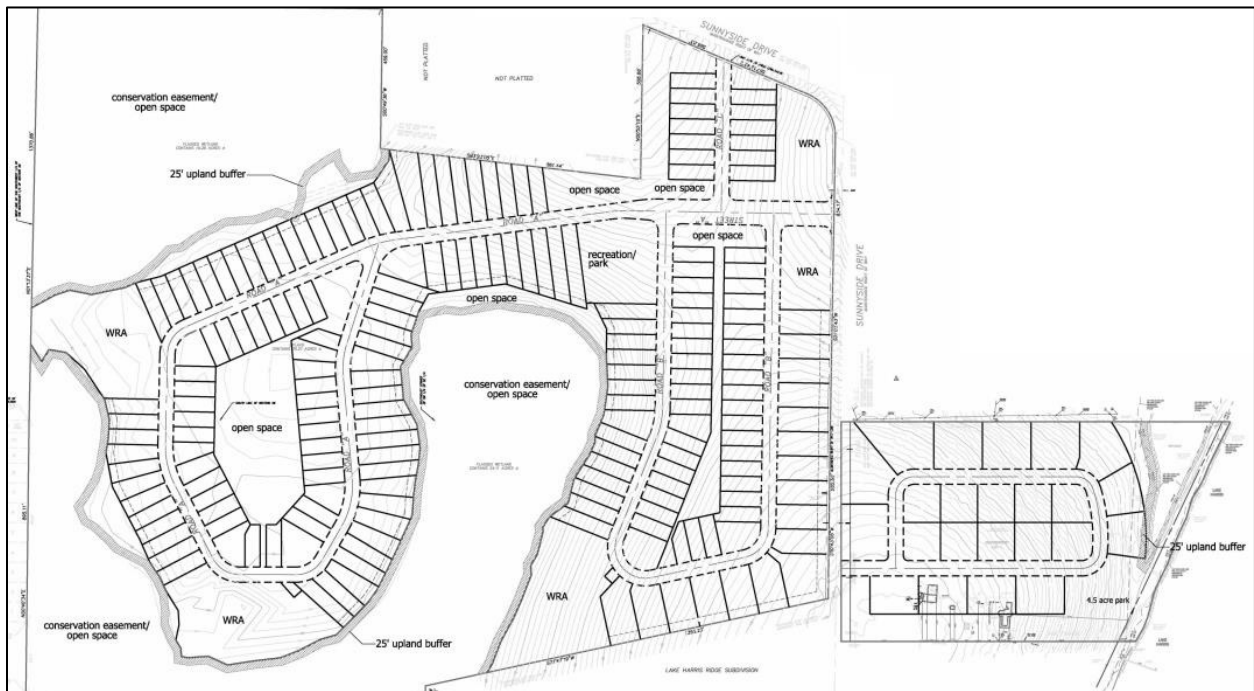
Griffey Engineering has analyzed the projected traffic impact for the proposed Sunnyside Landing project. The project will access via Sunnyside Drive. The existing use is vacant land. The proposed use will have 219 single-family residential units. The expected build-out year is 2024. Figure 1 shows the proposed project area on a vicinity map. Figure 2 shows the project on an aerial map. Figure 3 shows the proposed site plan.



- Figure 1 - Vicinity Map



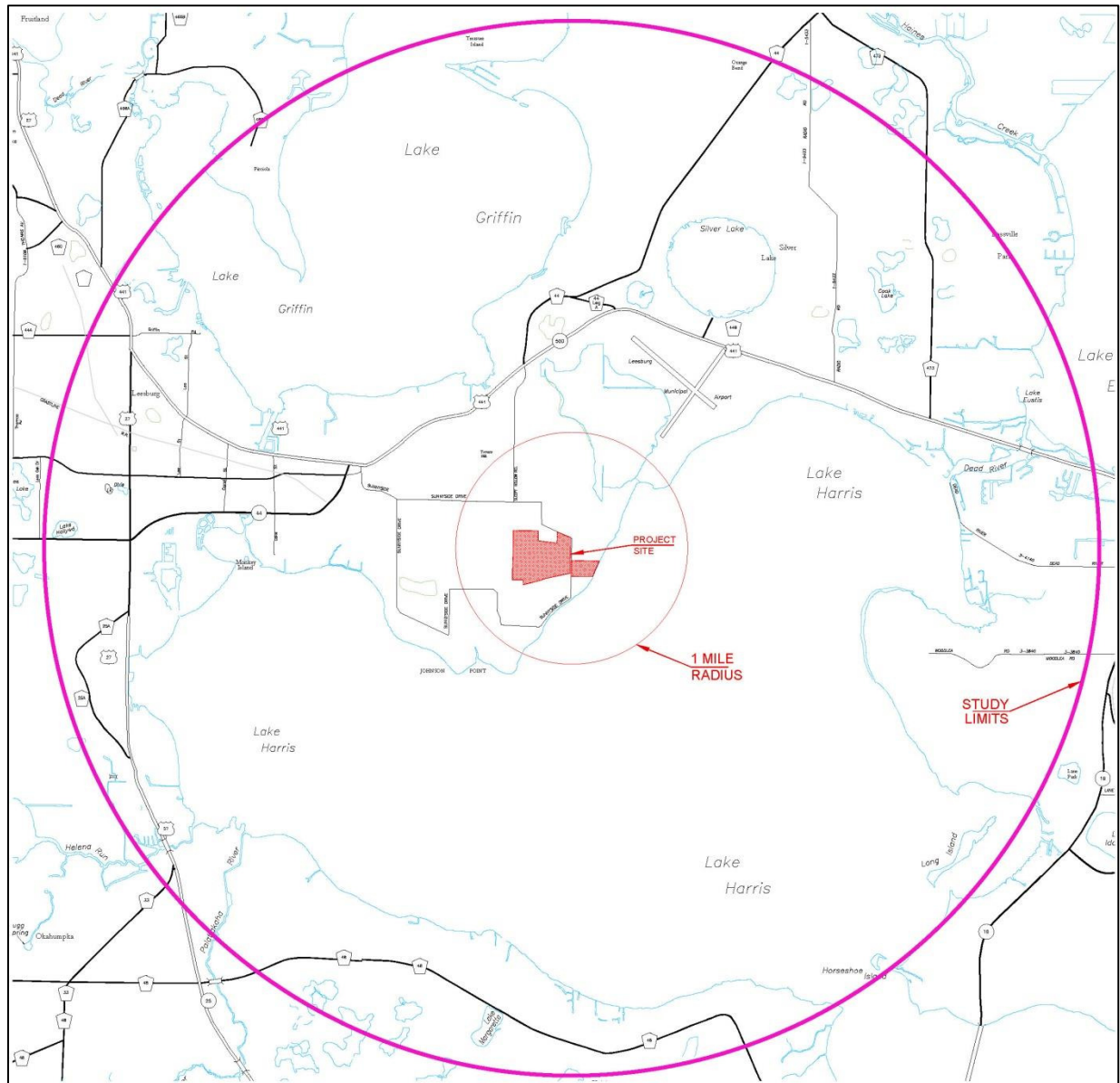
• Figure 2 – Aerial Map



• Figure 3 – Site Plan

STUDY AREA

A 4.55 mile radius was drawn from the project access point to determine the impact study limits. This radius is one-half of the average trip length for single-family uses as established in the *Lake County Transportation Impact Fee Schedule*. Figure 4 shows the study area. Table 1 lists the road segments within the study area. Table 2 lists the studied TMS segments. Table 3 lists the studied intersections



• Figure 4 – Study Area

• Table 1 – Road Segments within Study Area

Roadway	Segment		Adopted LOS	LOS Cap.	Project Trips					Within 1 Mi?	In Study?
	From	To			% Dist	NB/EB	SB/WB	Pk Dir	% Cap.		
C.R. 25A	U.S. 27 (North)	U.S. 27 (South)	D	675	0%	0	0	0	0.0%	No	No
C.R. 44	Silver Lake Road	C.R. 473	D	720	8%	6	11	11	1.5%	No	No
C.R. 44	U.S. 441	Silver Lake Road	D	792	11%	9	15	15	1.9%	No	No
C.R. 44 Leg A	C.R. 44	U.S. 441	D	675	0%	0	0	0	0.0%	No	No
C.R. 449 (Silver Lake)	C.R. 44	Morningside Drive	D	675	0%	0	0	0	0.0%	No	No
C.R. 449 (Silver Lake)	Morningside Drive	U.S. 441	D	675	3%	3	4	4	0.6%	No	No
C.R. 44A (Griffin Road)	Thomas Road	U.S. 27/U.S. 441	D	675	4%	5	4	5	0.7%	No	No
C.R. 473	Fountain Lake Boulevard	U.S. 441	D	1,467	2%	1	3	3	0.2%	No	No
C.R. 473	C.R. 44	Fountain Lake Boulevard	D	675	1%	1	1	1	0.1%	No	No
C.R. 48	U.S. 27	Lime Avenue	D	792	0%	0	0	0	0.0%	No	No
C.R. 48	Lime Avenue	S.R. 19	D	792	0%	0	0	0	0.0%	No	No
Canal Street	Main Street	S.R. 44	D	792	1%	1	1	1	0.1%	No	No
Canal Street	U.S. 441	Main Street	D	792	3%	3	4	4	0.5%	No	No
Griffin Road	U.S. 27	Lee Street	D	675	0%	0	0	0	0.0%	No	No
Lake Street	U.S. 441	Main Street	D	792	1%	1	1	1	0.1%	No	No
Lake Street	Main Street	S.R. 44	D	792	1%	1	1	1	0.1%	No	No
Lee Street	Griffin Road	U.S. 441	D	675	1%	1	1	1	0.1%	No	No
Lee Street	U.S. 441	Main Street	D	675	1%	1	1	1	0.1%	No	No
Lone Oak Drive	Main Street	S.R. 44	D	792	1%	1	1	1	0.1%	No	No
Main Street (Leesburg)	U.S. 27	Lee Street	D	750	3%	4	3	4	0.5%	No	No
Main Street (Leesburg)	Lee Street	Canal Street	D	750	5%	7	4	7	0.9%	No	No
Main Street (Leesburg)	Thomas Avenue	U.S. 27	D	880	2%	3	1	3	0.3%	No	No
Main Street (Leesburg)	Dixie Avenue / S.R. 44	Chols Drive / Sunnyside Dr	D	675	4%	5	4	5	0.7%	No	No
Main Street (Leesburg)	Canal Street	Lake Street	D	750	5%	7	4	7	0.9%	No	No
Main Street (Leesburg)	Lake Street	Dixie Avenue / S.R. 44	D	750	6%	8	5	8	1.1%	No	No
Radio Road	Morningside Drive	U.S. 441	D	675	1%	1	1	1	0.1%	No	No
Radio Road	C.R. 44	Morningside Drive	D	675	1%	1	1	1	0.1%	No	No
Sleepy Hollow Road	U.S. 441	Sunnyside Drive	D	675	43%	34	59	59	8.7%	Yes	Yes
S.R. 44	S Lone Oak Drive	U.S. 27	D	1,630	12%	16	10	16	1.0%	No	No
S.R. 44 (Dixie Avenue)	U.S. 27	S 9Th Street	D	1,630	21%	29	17	29	1.8%	No	No
S.R. 44 (Dixie Avenue)	S 9Th Street	Canal Street	D	1,630	25%	34	20	34	2.1%	No	No
S.R. 44 (Dixie Avenue)	Canal Street	S Lake Street	D	2,000	28%	38	23	38	1.9%	No	No
S.R. 44 (Dixie Avenue)	S Lake Street	E Main Street	D	2,000	28%	38	23	38	1.9%	No	No
S.R. 44 (Dixie Avenue)	E Main Street	U.S. 441	D	2,000	23%	18	32	32	1.6%	No	No
Sunnyside Drive	ain Street/Dr Nichols Dr	Sleepy Hollow Road	D	675	57%	78	46	78	11.6%	Yes	Yes
Sunnyside Drive	Sleepy Hollow Road	Bridgewater Court	D	675	100%	80	137	137	20.3%	Yes	Yes
Sunnyside Drive	Bridgewater Court	Sunnyside Drive	D	675	0%	0	0	0	0.0%	No	No
U.S. 27/S.R. 25	U.S. 27/U.S.441 Split	Main Street	D	1,630	0%	0	0	0	0.0%	No	No
U.S. 27/S.R. 25	Main Street	S.R. 44	D	1,630	0%	0	0	0	0.0%	No	No
U.S. 27/S.R. 25	S.R. 44	C.R. 25A (South)	D	1,630	9%	12	8	12	0.7%	No	No
U.S. 27/S.R. 25	C.R. 25A (South)	C.R. 33	D	2,000	9%	12	8	12	0.6%	No	No
U.S. 27/U.S.441	C.R. 466A (Lee Road)	C.R. 44A/ Griffin Road	D	3,020	14%	11	19	19	0.6%	No	No
U.S. 27/U.S.441	C.R. 44A/ Griffin Road	U.S. 27/U.S.441 Split	D	2,520	14%	11	19	19	0.8%	No	No
U.S. 441/ S.R. 500	U.S. 27/U.S.441 Split	Lee Street	D	1,630	19%	26	15	26	1.6%	No	No
U.S. 441/ S.R. 500	Lee Street	N Cannal Street	D	1,630	22%	30	18	30	1.8%	No	No
U.S. 441/ S.R. 500	N Cannal Street	E Dixie Avenue	D	2,000	25%	34	20	34	1.7%	No	No
U.S. 441/ S.R. 500	E Dixie Avenue	E Main Street	D	3,020	4%	5	4	5	0.2%	No	No
U.S. 441/ S.R. 500	E Main Street	C.R. 44	D	3,020	5%	7	4	7	0.2%	No	No
U.S. 441/ S.R. 500	C.R. 44	Radio Road	D	3,020	29%	23	40	40	1.3%	No	No
U.S. 441/ S.R. 500	Radio Road	C.R. 473	D	3,020	21%	17	29	29	1.0%	No	No
U.S. 441/ S.R. 500	C.R. 473	Old U.S. 441/ C.R. 500A	D	3,020	18%	14	25	25	0.8%	No	No

• Table 2 – Studied TMS segments

Roadway	Segment		No. of Lanes	Adptd LOS
	From	To		
Sleepy Hollow Road	U.S. 441	Sunnyside Drive	2	D
Sunnyside Drive	Main Street/Dr Nichols Drive	Sleepy Hollow Road	2	D
Sunnyside Drive	Sleepy Hollow Road	Bridgewater Court	2	D

• Table 3 – Studied Intersections

Period	Intersection		Signalized	Turn Lanes
	Major Road	Minor Road		
PM PK HR	E. Main St.	Sunnyside Drive	No	No
PM PK HR	Sunnyside Dr.	Sleepy Hollow Rd.	No	No
PM PK HR	US 441	CR 44/Sleepy Hollow Rd	Yes	Yes

PLANNED & PROGRAMMED IMPROVEMENTS

• Table 4 – Planned & Programmed Improvements

LOCATION	IMPROVEMENT	YEAR	AGENCY
US 441 from Perkins St to SR 44	Widen to 6-Lanes - DSN	2019	FDOT

COMMITTED DEVELOPMENT

The effect of committed developments is a consideration for determining future background traffic. For this analysis, the traffic from committed developments is incorporated by considering the reserved traffic volumes from the Lake-Sumter MPO Transportation Management System.

EXISTING CONDITIONS

Existing travel conditions include PM peak hour/peak direction traffic volumes, as well as adopted levels of service (LOS) and available capacity for the studied roads. Roadway

capacities were obtained from the latest version of the LSMPO TMS. Table 5 shows the road segments evaluated for this study along with their adopted LOS, service volumes and capacity volumes.

• Table 5 – Road Capacities

Roadway	Segment		Adptd LOS	Service Volumes (Pk Hr/Pk Dir)					LOS Cap.
	From	To		A	B	C	D	E	
Sleepy Hollow Road	U.S. 441	Sunnyside Drive	D	0	0	333	675	720	675
Sunnyside Drive	Main Street/Dr Nichols Drive	Sleepy Hollow Road	D	0	0	333	675	720	675
Sunnyside Drive	Sleepy Hollow Road	Bridgewater Court	D	0	0	333	675	720	675

Table 6 summarizes the existing traffic volumes for the roads under study. Volumes were obtained from the most recent Lake County and FDOT traffic counts. Annual growth rates for county roads were taken from the 2018 traffic count report. Annual growth rates for state roads were calculated from historic count data using a linear regression analysis. Those calculations are included in Appendix B.

• Table 6 – 2018 Traffic Volumes

Roadway	Segment		LOS Cap.	AADT Volume	Annual Growth	Directional Volumes			
	From	To				NB/EB	Avail.	SB/WB	Avail.
Sleepy Hollow Road	U.S. 441	Sunnyside Drive	675	4,263	8.83%	228	447	178	497
Sunnyside Drive	Main Street/Dr Nichols Drive	Sleepy Hollow Road	675	2,543	6.80%	141	534	106	569
Sunnyside Drive	Sleepy Hollow Road	Bridgewater Court	675	1,678	-3.77%	66	609	99	576

Appendix C provides turning movement count reports, adjusted turning movement count data sheets, and the HCS7 (Highway Capacity Software, version 7.8.5) intersection analysis printouts. Table 7 summarizes the existing intersection level of service.

• Table 7 – Existing Intersection Level of Service (LOS)

Intersection	Adopted LOS	PM Peak-Hour	
		Delay (s/Veh)	LOS
E. Main St. & Sunnyside Drive	D	9.5	A
Sunnyside Dr. & Sleepy Hollow Rd.	D	9.3	A
US 441 & CR 44/Sleepy Hollow Rd	D	63.3	E

TRIP GENERATION

Trip rates in this analysis are from the ITE publication, Trip Generation, 10th Edition. Table 8 below summarizes the land use type, land use code and trip rate for the proposed development. Table 9 summarizes the trip generation volume for the proposed use. Table 10 summarizes the net new trips for the proposed development.

• Table 8 – ITE Trip Rate

LAND USE	LUC	UNIT RATE	24 HOUR	PM PEAK HOUR		
			EQUATION	EQUATION	% In	% Out
Single-Family Detached Housing	210	Trips/Dwelling Units	Average Rate = 9.44	Average Rate = 0.99	63%	37%

• Table 9 – Proposed Trip Generation Volumes

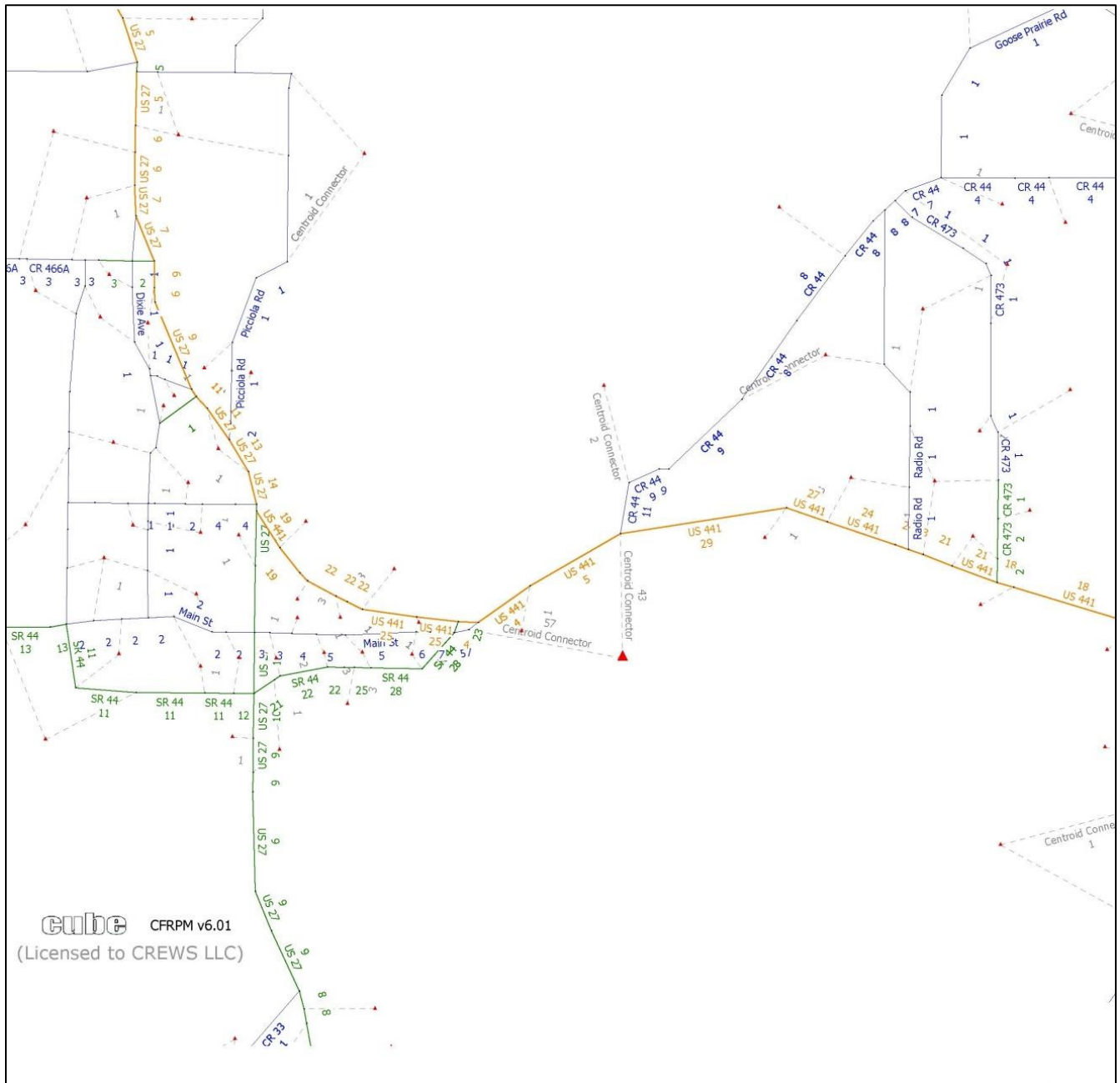
LAND USE	AMOUNT	24 HR	PM PK HR		
			Vol.	In	Out
Single-Family Detached Housing	219 Dwelling Units	2,067	217	137	80

• Table 10 – Net New Trips

CONDITION	24 HOUR	PM PEAK HOUR		
	Vol.	Vol.	In	Out
Existing	0	0	0	0
Proposed	2,067	217	137	80
Net New Trips	2,067	217	137	80

TRIP DISTRIBUTION

The project trip distribution was determined using the Central Florida Regional Planning Model. Figure 5 shows the percentage distribution of project traffic on the study area.



- Figure 5 - Project Trip Distribution

FUTURE BACKGROUND TRAFFIC

For the purposes of this analysis, the future background traffic is calculated using growth rates for the county and state roads. Reserved trips from the LSMPO TMS were also considered. Where the reserved trip volume exceeded the background growth volume, they were used instead.

• Table 11 – Future 2024 Road Volumes & Capacity

Roadway	Segment		LOS Cap.	Growth Rate	CURRENT YEAR: 2018					FUTURE YEAR: 2024				
					NB/EB					SB/WB				
	From	To			Ex.Vol.	Grwth	Resrv	Futr.Vol.	Avail.	Ex.Vol.	Grwth	Resrv	Futr.Vol.	Avail.
Sleepy Hollow Road	U.S. 441	Sunnyside Drive	675	8.83%	228	121	0	349	326	178	94	0	272	403
Sunnyside Drive	Main Street/Dr Nichols Drive	Sleepy Hollow Road	675	6.80%	141	58	0	199	476	106	43	0	149	526
Sunnyside Drive	Sleepy Hollow Road	Bridgewater Court	675	1.00%	66	4	0	70	605	99	6	0	105	570

FUTURE ANALYSIS

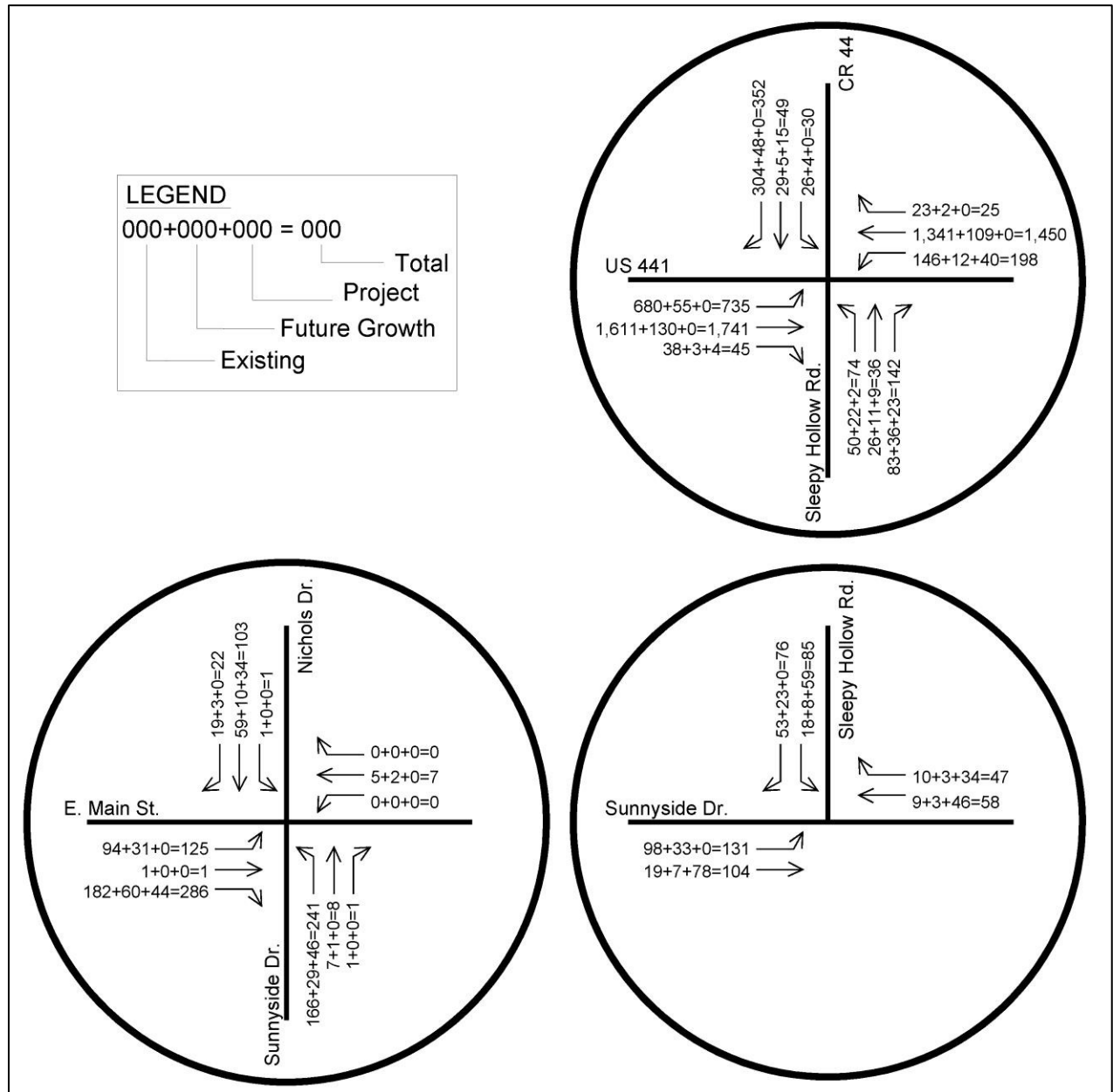
For the future analysis the calculated future volumes are added to the assigned project volumes. This provides an estimate of traffic volumes for the study horizon year. Table 12 summarizes those volumes.

• Table 12 – Future 2024 Road Volumes & Capacity with Project Traffic

Roadway	Segment		NB/EB			SB/WB			Pk Dir Vol	LOS Cap.	V/C	Avail. Capacity	Project V/C
	From	To	Future	Proj	Total	Future	Proj	Total					
Sleepy Hollow Road	U.S. 441	Sunnyside Drive	349	34	383	272	59	331	383	675	0.57	292	0.087
Sunnyside Drive	Main Street/Dr Nichols Drive	Sleepy Hollow Road	199	78	277	149	46	195	277	675	0.41	398	0.116
Sunnyside Drive	Sleepy Hollow Road	Bridgewater Court	70	80	150	105	137	242	242	675	0.36	433	0.203

The studied intersections were also evaluated for the future condition. Future background turning movements were calculated using the growth rate for the road segment. Turning movements for the project traffic were calculated using the trip

distribution percentages. These were then added to the existing turning movements to get future turning movements. Figure 6 shows the future turning movements for the intersections within the study area. Using these, the future intersection LOS was calculated. The detailed output of the future intersection analysis is included in Appendix D. Table 13 summarizes the future intersection LOS with project traffic.



• Figure 6 - Future Turning Movements

• Table 13 – Future 2024 Intersection LOS (with Project Traffic)

Intersection	Adptd LOS	PM Peak-Hour	
		Delay (S/Veh)	LOS
E. Main St. & Sunnyside Drive	D	12.9	B
Sunnyside Dr. & Sleepy Hollow Rd.	D	14.2	B
US 441 & CR 44/Sleepy Hollow Rd	D	85.9	F

MITIGATION ANALYSIS

The roadway analysis shows that the studied road sections will not exceed their LOS capacity in the future condition.

The intersection analysis shows that the intersection of US 441 & CR 44/Sleepy Hollow Road falls below the adopted level of service in both the existing and future conditions. This intersection was further evaluated to determine if modifications could improve its operation. Table 14 shows the existing condition of the intersection. Table 15 shows the future condition without the addition of project traffic.

• Table 14 – Existing Intersection LOS

Intersection	Adptd LOS	PM Peak-Hour	
		Delay (S/Veh)	LOS
US 441 & CR 44/Sleepy Hollow Rd	D	63.3	E

• Table 15 – Future 2024 Intersection LOS (without Project Traffic)

Intersection	Adptd LOS	PM Peak-Hour	
		Delay (S/Veh)	LOS
US 441 & CR 44/Sleepy Hollow Rd	D	81.5	F

The existing and future conditions were then evaluated with modifications to the signal. This intersection is not part of a coordinated system, so the signal timings can be more easily adjusted. For this analysis, the signal timings were optimized in the HCS software and a right-turn overlap phase was added to the southbound right turn on CR 44. These are relatively minor modifications that could be implemented now. Tables 16 & 17 show the results for the existing and future conditions.

• Table 16 – Existing Intersection LOS (with improvement)

Intersection	Adptd LOS	PM Peak-Hour	
		Delay (S/Veh)	LOS
US 441 & CR 44/Sleepy Hollow Rd	D	34.9	C*

*With timing optimization + right-turn overlap phase on SB right turn

• Table 17 – Future 2024 Intersection LOS (with Improvement)

Intersection	Adptd LOS	PM Peak-Hour	
		Delay (S/Veh)	LOS
US 441 & CR 44/Sleepy Hollow Rd	D	39.8	D*

*With timing optimization + right-turn overlap phase on SB right turn

Finally, the future intersection with improvements plus the addition of project traffic was analyzed. Table 18 shows that result.

• Table 18 – Future 2024 Intersection LOS (with Improvement + Project Traffic)

Intersection	Adptd LOS	PM Peak-Hour	
		Delay (S/Veh)	LOS
US 441 & CR 44/Sleepy Hollow Rd	D	42.8	D*

*With timing optimization + right-turn overlap phase on SB right turn

CONCLUSIONS & RECOMMENDATIONS

The analysis presented in this report indicates that the studied roads will have sufficient capacity to accommodate background growth and project traffic in the future condition. The intersections of E. Main Street & Sunnyside Drive and Sunnyside Drive & Sleepy Hollow Road will have sufficient capacity to accommodate background growth and project traffic in the future condition without any intersection modifications. The intersection of US 441 & CR 44/Sleepy Hollow Road is currently deficient and will be more so in the future even without project traffic. This intersection operation could be improved with a minor modification of signal timing adjustment and the addition of a right-turn overlap phase for southbound right turns. This modification should be proposed to FDOT and Lake County for consideration to improve current operation. With these modifications, the intersection will have sufficient capacity to accommodate background growth plus project traffic in the future condition.

APPENDIX A

METHODOLOGY

GRIFFEY ENGINEERING, INC.

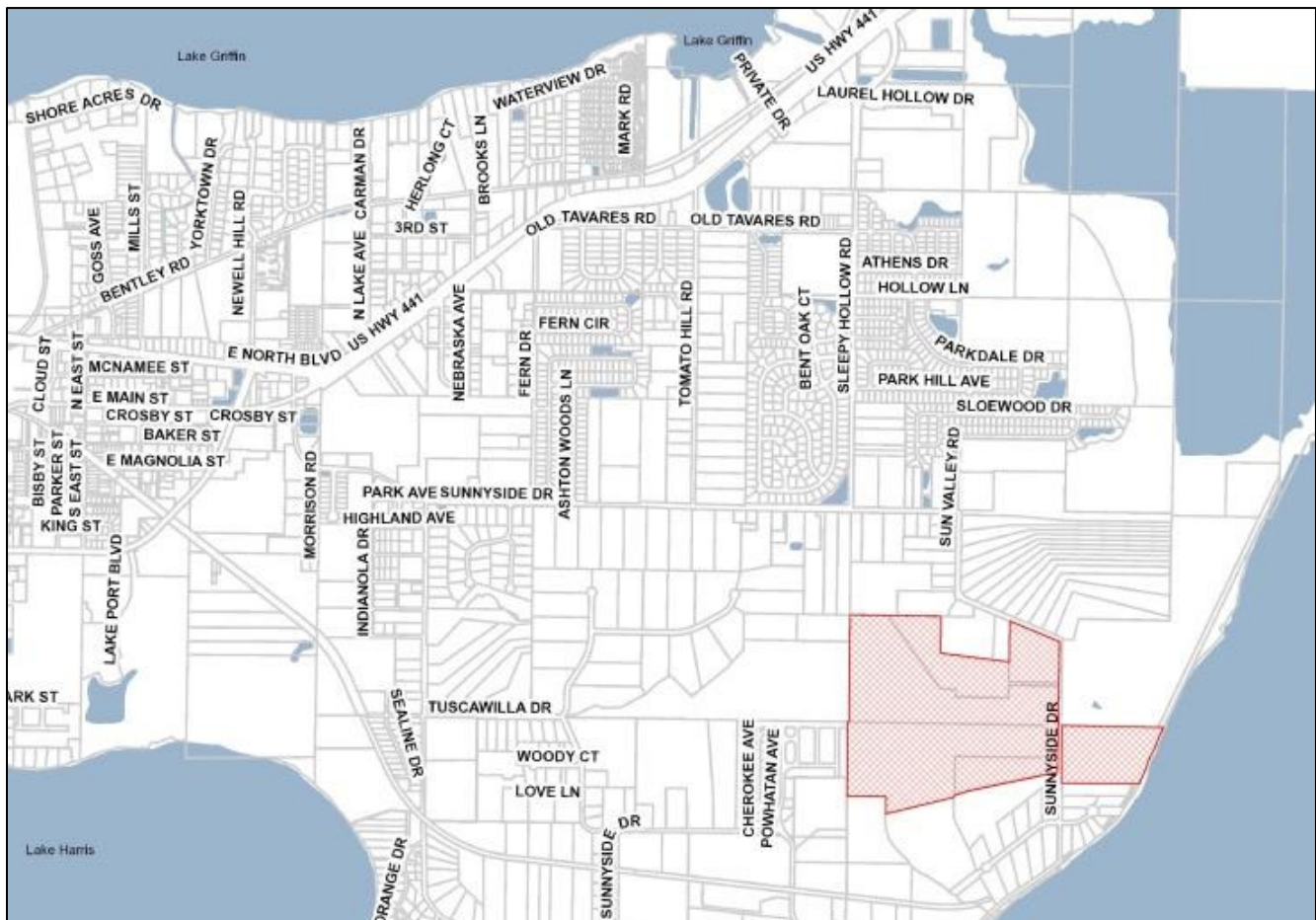
August 13, 2019

Dan Miller, AICP, Planning and Zoning Manager
City of Leesburg
204 N. 5th Street
Leesburg, Florida 34748

Re: Sunnyside Landing
Traffic Impact Analysis Methodology

Dear Dan:

Griffey Engineering has been retained to perform a Traffic Impact Study for a proposed single-family residential development. The project site is located on Sunnyside Drive. The figures below show the proposed project on a vicinity map and on an aerial.





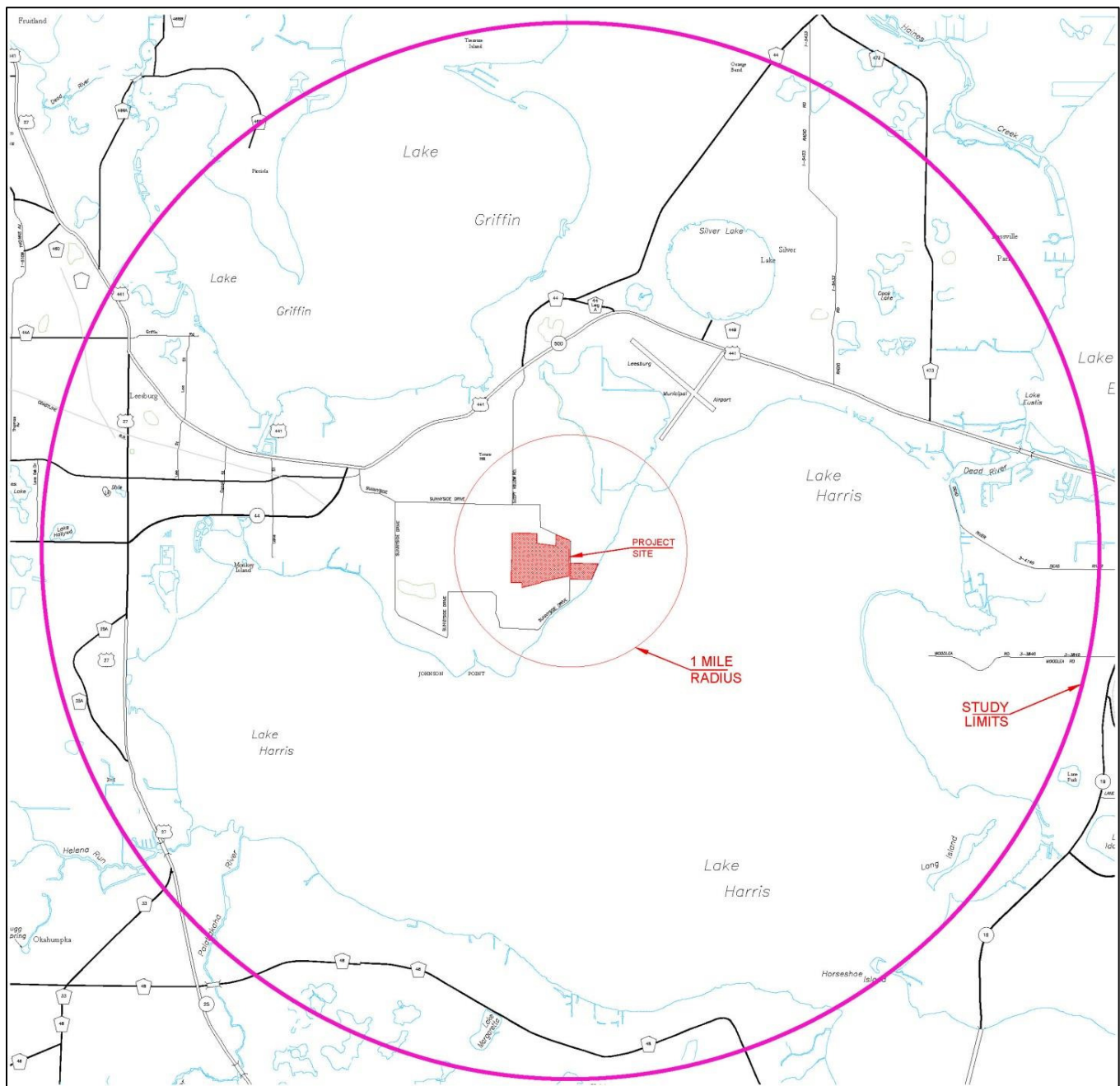
The existing property is vacant land with no associated trip generation. The proposed development will have 219 single-family units. The horizon year for the study will be 2024. The tables below show the trip rates and projected volumes. The trip rates are from the ITE Trip Generation Manual, 10th Edition.

LAND USE	LUC	UNIT RATE	24 HOUR	PM PEAK HOUR		
			EQUATION	EQUATION	% In	% Out
Single-Family Detached Housing	210	Trips/Dwelling Units	Average Rate = 9.44	Average Rate = 0.99	63%	37%

LAND USE	AMOUNT	24 HR	PM PK HR		
			Vol.	In	Out
Single-Family Detached Housing	219 Dwelling Units	2,067	217	137	80

The traffic impact study will follow standard procedures as recommended in the FDOT Site Impact Handbook and the Lake-Sumter MPO Traffic Impact Study Methodology and Guidelines (2017). This includes the following: Existing Conditions Analysis; Trip Generation; Trip Distribution & Assignment; Future Conditions Analysis; and Mitigation Analysis. The analysis will be a Tier 2 TIS.

Access for the project will be from Sunnyside Drive. The proposed study area is bounded by a 4.55 mile radius from the project. The study area is based on $\frac{1}{2}$ the total trip length for single-family uses from the Lake County impact fee schedule. The studied roadways will include all roads in the Transportation Management System (TMS) within a one mile radius of the project, plus all TMS road segments within the study area where the project peak hour trip volume is 5% or greater of the adopted LOS capacity. The following exhibit shows the study area:



The following exhibit shows the project trip distribution:



The following table lists the TMS segments within the study area considered for study.

Roadway	Segment		Adopted LOS	LOS Cap.	Project Trips					Within 1 Mi?	In Study?
	From	To			% Dist	NB/EB	SB/WB	Pk Dir	% Cap.		
C.R. 25A	U.S. 27 (North)	U.S. 27 (South)	D	675	0%	0	0	0	0.0%	No	No
C.R. 44	Silver Lake Road	C.R. 473	D	720	8%	6	11	11	1.5%	No	No
C.R. 44	U.S. 441	Silver Lake Road	D	792	11%	9	15	15	1.9%	No	No
C.R. 44 Leg A	C.R. 44	U.S. 441	D	675	0%	0	0	0	0.0%	No	No
C.R. 449 (Silver Lake)	C.R. 44	Morningside Drive	D	675	0%	0	0	0	0.0%	No	No
C.R. 449 (Silver Lake)	Morningside Drive	U.S. 441	D	675	3%	3	4	4	0.6%	No	No
C.R. 44A (Griffin Road)	Thomas Road	U.S. 27/U.S. 441	D	675	4%	5	4	5	0.7%	No	No
C.R. 473	Fountain Lake Boulevard	U.S. 441	D	1,467	2%	1	3	3	0.2%	No	No
C.R. 473	C.R. 44	Fountain Lake Boulevard	D	675	1%	1	1	1	0.1%	No	No
C.R. 48	U.S. 27	Lime Avenue	D	792	0%	0	0	0	0.0%	No	No
C.R. 48	Lime Avenue	S.R. 19	D	792	0%	0	0	0	0.0%	No	No
Canal Street	Main Street	S.R. 44	D	792	1%	1	1	1	0.1%	No	No
Canal Street	U.S. 441	Main Street	D	792	3%	3	4	4	0.5%	No	No
Griffin Road	U.S. 27	Lee Street	D	675	0%	0	0	0	0.0%	No	No
Lake Street	U.S. 441	Main Street	D	792	1%	1	1	1	0.1%	No	No
Lake Street	Main Street	S.R. 44	D	792	1%	1	1	1	0.1%	No	No
Lee Street	Griffin Road	U.S. 441	D	675	1%	1	1	1	0.1%	No	No
Lee Street	U.S. 441	Main Street	D	675	1%	1	1	1	0.1%	No	No
Lone Oak Drive	Main Street	S.R. 44	D	792	1%	1	1	1	0.1%	No	No
Main Street (Leesburg)	U.S. 27	Lee Street	D	750	3%	4	3	4	0.5%	No	No
Main Street (Leesburg)	Lee Street	Canal Street	D	750	5%	7	4	7	0.9%	No	No
Main Street (Leesburg)	Thomas Avenue	U.S. 27	D	880	2%	3	1	3	0.3%	No	No
Main Street (Leesburg)	Dixie Avenue / S.R. 44	Nichols Drive / Sunnyside Drive	D	675	4%	5	4	5	0.7%	No	No
Main Street (Leesburg)	Canal Street	Lake Street	D	750	5%	7	4	7	0.9%	No	No
Main Street (Leesburg)	Lake Street	Dixie Avenue / S.R. 44	D	750	6%	8	5	8	1.1%	No	No
Radio Road	Morningside Drive	U.S. 441	D	675	1%	1	1	1	0.1%	No	No
Radio Road	C.R. 44	Morningside Drive	D	675	1%	1	1	1	0.1%	No	No
Sleepy Hollow Road	U.S. 441	Sunnyside Drive	D	675	43%	34	59	59	8.7%	Yes	Yes
S.R. 44	S Lone Oak Drive	U.S. 27	D	1,630	12%	16	10	16	1.0%	No	No
S.R. 44 (Dixie Avenue)	U.S. 27	S 9Th Street	D	1,630	21%	29	17	29	1.8%	No	No
S.R. 44 (Dixie Avenue)	S 9Th Street	Canal Street	D	1,630	25%	34	20	34	2.1%	No	No
S.R. 44 (Dixie Avenue)	Canal Street	S Lake Street	D	2,000	28%	38	23	38	1.9%	No	No
S.R. 44 (Dixie Avenue)	S Lake Street	E Main Street	D	2,000	28%	38	23	38	1.9%	No	No
S.R. 44 (Dixie Avenue)	E Main Street	U.S. 441	D	2,000	23%	18	32	32	1.6%	No	No
Sunnyside Drive	Main Street/Dr Nichols Dr	Sleepy Hollow Road	D	675	57%	78	46	78	11.6%	Yes	Yes
Sunnyside Drive	Sleepy Hollow Road	Bridgewater Court	D	675	100%	80	137	137	20.3%	Yes	Yes
Sunnyside Drive	Bridgewater Court	Sunnyside Drive	D	675	0%	0	0	0	0.0%	No	No
U.S. 27/S.R. 25	U.S. 27/U.S.441 Split	Main Street	D	1,630	0%	0	0	0	0.0%	No	No
U.S. 27/S.R. 25	Main Street	S.R. 44	D	1,630	0%	0	0	0	0.0%	No	No
U.S. 27/S.R. 25	S.R. 44	C.R. 25A (South)	D	1,630	9%	12	8	12	0.7%	No	No
U.S. 27/S.R. 25	C.R. 25A (South)	C.R. 33	D	2,000	9%	12	8	12	0.6%	No	No
U.S. 27/U.S.441	C.R. 466A (Lee Road)	C.R. 44A/ Griffin Road	D	3,020	14%	11	19	19	0.6%	No	No
U.S. 27/U.S.441	C.R. 44A/ Griffin Road	U.S. 27/U.S.441 Split	D	2,520	14%	11	19	19	0.8%	No	No
U.S. 441/ S.R. 500	U.S. 27/U.S.441 Split	Lee Street	D	1,630	19%	26	15	26	1.6%	No	No
U.S. 441/ S.R. 500	Lee Street	N Cannal Street	D	1,630	22%	30	18	30	1.8%	No	No
U.S. 441/ S.R. 500	N Cannal Street	E Dixie Avenue	D	2,000	25%	34	20	34	1.7%	No	No
U.S. 441/ S.R. 500	E Dixie Avenue	E Main Street	D	3,020	4%	5	4	5	0.2%	No	No
U.S. 441/ S.R. 500	E Main Street	C.R. 44	D	3,020	5%	7	4	7	0.2%	No	No
U.S. 441/ S.R. 500	C.R. 44	Radio Road	D	3,020	29%	23	40	40	1.3%	No	No
U.S. 441/ S.R. 500	Radio Road	C.R. 473	D	3,020	21%	17	29	29	1.0%	No	No
U.S. 441/ S.R. 500	C.R. 473	Old U.S. 441/ C.R. 500A	D	3,020	18%	14	25	25	0.8%	No	No

The following table lists the TMS segments for study. The analysis period will be a PM Peak Hour/Peak direction evaluation. Current volumes will be based on the most recent FDOT and Lake County traffic counts. Future background volumes will be calculated using growth rates from the county traffic count report and will be calculated for state

roads based on historic count data. The future conditions analysis will also consider reserved trips from the LSMPO TMS Segment Report. Where the reserved volume exceeds the volume from background growth, then the reserved volume will be used instead of the growth volume. Trip distribution will be developed using the Central Florida Regional Planning Model (CFRPM).

Seg. ID	Roadway	Segment		No. of Lanes	Adptd LOS
		From	To		
1875	Sleepy Hollow Road	U.S. 441	Sunnyside Drive	2	D
180	Sunnyside Drive	Main Street/Dr Nichols Drive	Sleepy Hollow Road	2	D
410	Sunnyside Drive	Sleepy Hollow Road	Bridgewater Court	2	D

The study will include intersection analysis for the existing and proposed conditions. Turning movement counts shall not be more than one year old. The following table lists the intersections and period of analysis proposed for evaluation.

Period	Intersection		Signalized	Turn Lanes
	Major Road	Minor Road		
PM PK HR	E. Main St.	Sunnyside Drive	No	No
PM PK HR	Sunnyside Dr.	Sleepy Hollow Rd.	No	No
PM PK HR	US 441	CR 44/Sleepy Hollow Rd	Yes	Yes

If these road segments and intersections are satisfactory and this methodology accepted, please let us know so that we can proceed with the traffic data collection. Should you have any questions or comments, please do not hesitate to contact us.

Sincerely,



Donald A. Griffey, P.E.

c. Greg Beliveau, LPG Urban & Regional Planners, Inc.

To:
From: Don Griffey <dag@griffeyengineering.com>
Subject: Re: FW: Sunnyside Traffic Methodology
Cc:
Bcc:
Attached:

From: Woods, Michael [mailto:mwoods@lakesumtermpo.com]
Sent: Wednesday, September 25, 2019 11:04 AM
To: Sherie Lindh <sherie@lpgurp.com>; Hutt, Brian <bhutt@lakesumtermpo.com>
Cc: Greg Beliveau <gregb@lpgurp.com>
Subject: RE: Sunnyside Traffic Methodology

The MPO has no comments on the proposed Traffic Impact Methodology proposed for the Sunnyside PUD project.

Sorry for the delay.

Thank you,

Michael Woods, Executive Director

Lake~Sumter MPO

352-315-0170 x2

From: Sherie Lindh [mailto:sherie@lpgurp.com]
Sent: Wednesday, September 25, 2019 10:28 AM
To: Woods, Michael <mwoods@lakesumtermpo.com>; Hutt, Brian <bhutt@lakesumtermpo.com>
Cc: Greg Beliveau <gregb@lpgurp.com>
Subject: Sunnyside Traffic Methodology

Good morning gentlemen,

Don Griffey submitted a traffic methodology to the City of Leesburg and the MPO back in August and still has not received any response. Can you please advise on the status of review.

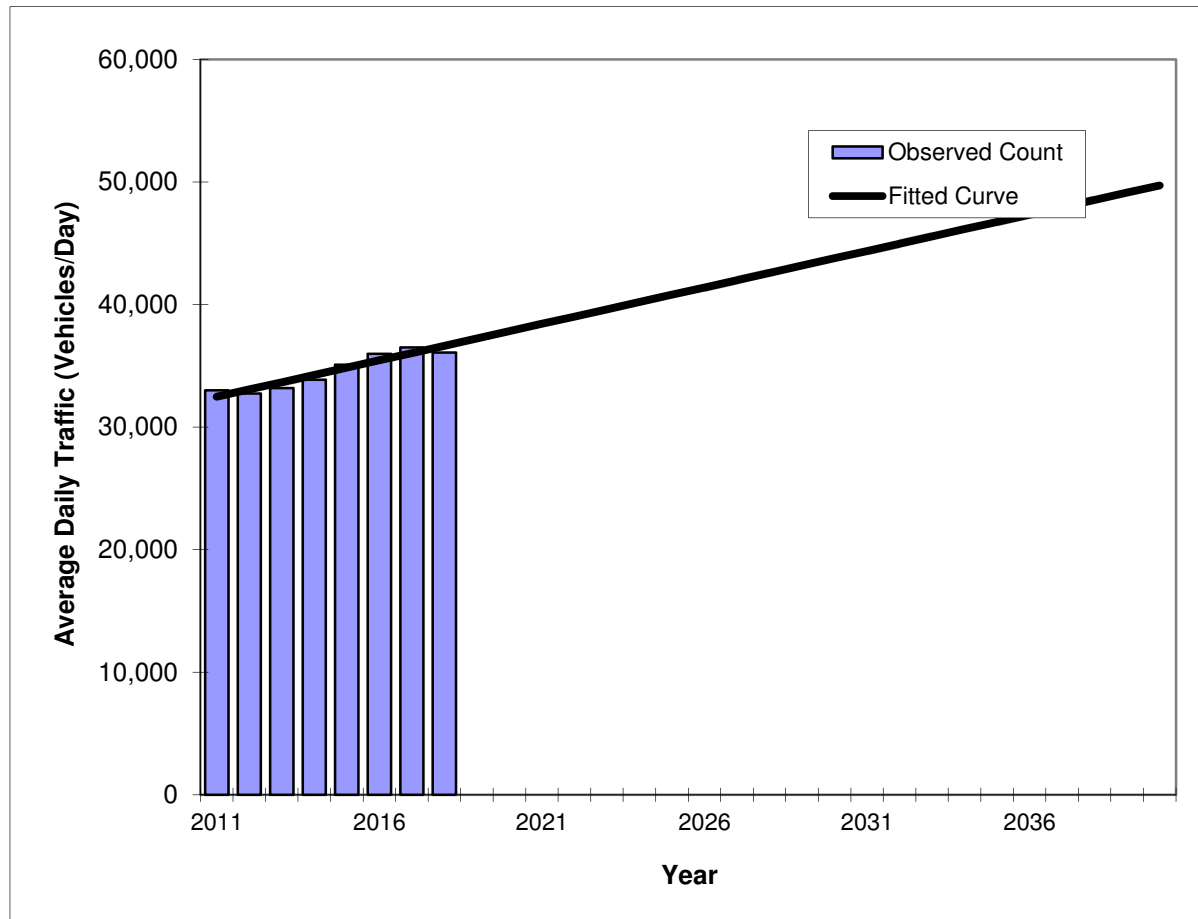
Thanks,
Sherie



APPENDIX B

GROWTH CALCULATIONS

BACKGROUND TRAFFIC GROWTH **LINEAR REGRESSION ANALYSIS** FDOT Sta 110177 - US 441 -- 0.3 Mi E of CR 44



Annual Trend Increase:	594.62
Trend R-squared:	89.98%
Trend Annual Historic Growth Rate:	1.33%
Trend Growth Rate:	1.62%

Year	Traffic (ADT/AADT)	
	Count	Trend
2011	33,012	32,479
2012	32,742	33,074
2013	33,188	33,669
2014	33,864	34,263
2015	35,102	34,858
2016	35,988	35,452
2017	36,506	36,047
2018	36,082	36,642
Opening Year Trend		
2019	N/A	37,236
Mid-Year Trend		
2022	N/A	39,020
Design Year Trend		
2024	N/A	40,209

APPENDIX C

TRAFFIC COUNTS & CURRENT INTERSECTION ANALYSIS

15 MINUTE TURNING MOVEMENT COUNTS

(Cars and Trucks)

DATE: September 25, 2019 (Wednesday)

CITY: Leesburg

LATITUDE: 0

LOCATION: Sunnyside Dr/Nichols Dr & Main St

COUNTY: Lake County

LONGITUDE: 0

Sunnyside Dr

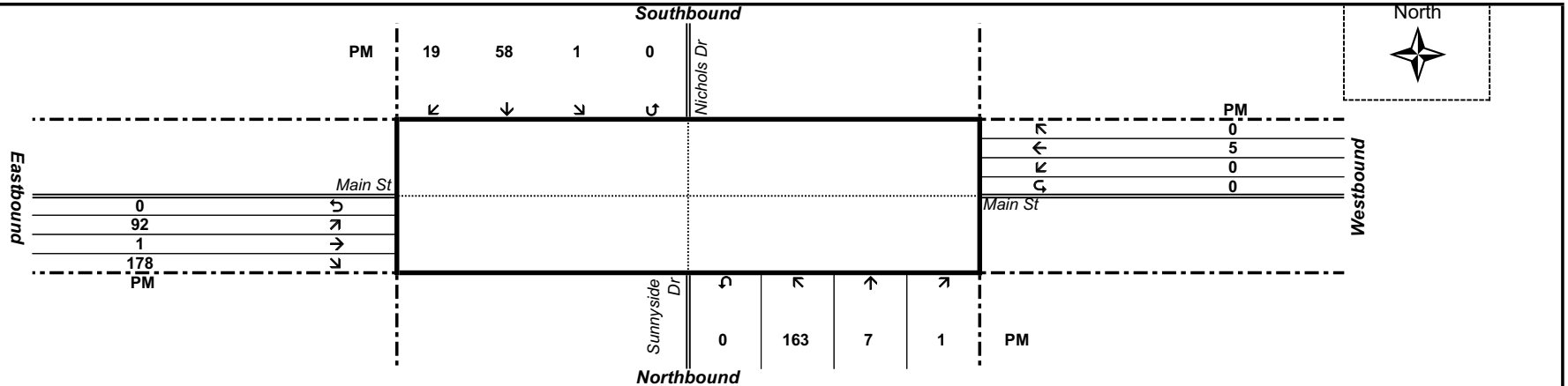
Nichols Dr

Main St

Main St

TIME BEGIN	NORTHBOUND					SOUTHBOUND					N/S TOTAL	EASTBOUND					WESTBOUND					E/W TOTAL	GRAND TOTAL
	L	T	R	U-turn	TOTAL	L	T	R	U-turn	TOTAL		L	T	R	U-turn	TOTAL	L	T	R	U-turn	TOTAL		
04:00 PM	31	3	0	0	34	1	14	7	0	22	56	18	2	31	0	51	0	1	2	0	3	54	110
04:15 PM	23	4	0	0	27	2	5	6	0	13	40	18	0	30	0	48	1	2	1	0	4	52	92
04:30 PM	29	3	0	0	32	2	14	9	0	25	57	24	0	38	0	62	0	2	1	0	3	65	122
04:45 PM	34	2	0	0	36	0	17	4	0	21	57	23	0	39	0	62	0	1	0	0	1	63	120
TOTAL	117	12	0	0	129	5	50	26	0	81	210	83	2	138	0	223	1	6	4	0	11	234	444
05:00 PM	48	1	1	0	50	0	12	10	0	22	72	32	0	39	0	71	0	1	0	0	1	72	144
05:15 PM	41	2	0	0	43	0	15	4	0	19	62	18	1	52	0	71	0	1	0	0	1	72	134
05:30 PM	40	2	0	0	42	1	14	1	0	16	58	19	0	48	0	67	0	2	0	0	2	69	127
05:45 PM	40	4	0	0	44	0	17	1	0	18	62	13	0	42	0	55	0	1	1	0	2	57	119
TOTAL	169	9	1	0	179	1	58	16	0	75	254	82	1	181	0	264	0	5	1	0	6	270	524

PM Peak																				Peak Hour Factor: 0.911			
04:45 PM to	163	7	1	0	171	1	58	19	0	78	249	92	1	178	0	271	0	5	0	0	5	276	525
05:45 PM																							



15 MINUTE TURNING MOVEMENT COUNTS

(Trucks Only)

DATE: September 25, 2019 (Wednesday)

CITY: Leesburg

LATITUDE: 0

LOCATION: Sunnyside Dr/Nichols Dr & Main St

COUNTY: Lake County

LONGITUDE: 0

Sunnyside Dr

Nichols Dr

Main St

Main St

TIME BEGIN	NORTHBOUND					SOUTHBOUND					N/S TOTAL	EASTBOUND					WESTBOUND					E/W TOTAL	GRAND TOTAL
	L	T	R	U-turn	TOTAL	L	T	R	U-turn	TOTAL		L	T	R	U-turn	TOTAL	L	T	R	U-turn	TOTAL		
04:00 PM	2	0	0	0	2	0	0	0	0	0	2	0	0	1	0	1	0	0	0	0	0	1	3
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	2	0	0	0	2	0	0	0	0	0	2	1	0	1	0	2	0	0	0	0	0	2	4
04:45 PM	2	0	0	0	2	0	1	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	3
TOTAL	6	0	0	0	6	0	1	0	0	1	7	1	0	2	0	3	0	0	0	0	0	3	10
05:00 PM	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	1	0	1	0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	1	2	3

PM Peak																							
04:45 PM to 05:45 PM	2	0	1	0	3	0	1	0	0	1	4	1	0	0	0	1	0	1	0	0	1	2	6

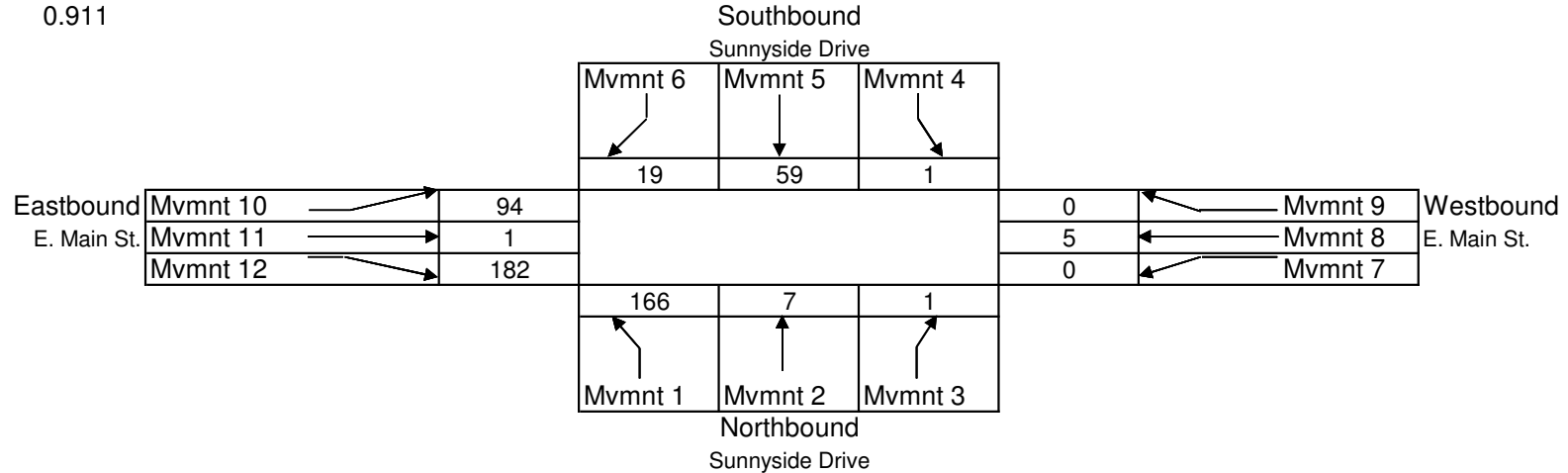
ADJUSTED TURNING MOVEMENT COUNT
PM PEAK HOUR

(N/S) STREET: Sunnyside Drive
(E/W) STREET: E. Main St.

Date of Count: 09/25/19
Seasonal Adjustment Factor: 1.02

PEAK HOUR VOLUMES (Raw)											
Northbound			Southbound			Eastbound			Westbound		
Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn
163	7	1	1	58	19	92	1	178	0	5	0

Peak Hour: 4:45 - 5:45 PM
Overall PHF: 0.911

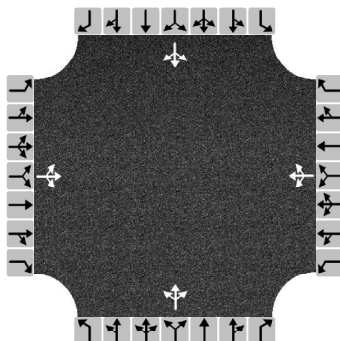


HCS7 All-Way Stop Control Report

General Information

Analyst	DAG	Intersection	E. Main St & Sunnyside Dr
Agency/Co.	Griffey Engineering	Jurisdiction	Leesburg
Date Performed	9/25/19	East/West Street	E. Main Street
Analysis Year	2019	North/South Street	Sunnyside Drive
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.91
Time Analyzed	4:45-5:45 PM		
Project Description	E. Main St. & Sunnyside Dr. - Existing		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	94	1	182	0	5	0	166	7	1	1	59	19
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	304			5			191			87		
Percent Heavy Vehicles	0			1			0			1		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.270			0.005			0.170			0.077		
Final Departure Headway, hd (s)	4.28			4.98			4.91			4.74		
Final Degree of Utilization, x	0.361			0.008			0.260			0.114		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, ts (s)	2.28			2.98			2.91			2.74		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	304			5			191			87		
Capacity	841			722			733			760		
95% Queue Length, Q ₉₅ (veh)	1.7			0.0			1.0			0.4		
Control Delay (s/veh)	9.7			8.0			9.6			8.3		
Level of Service, LOS	A			A			A			A		
Approach Delay (s/veh)	9.7			8.0			9.6			8.3		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	9.5						A					

15 MINUTE TURNING MOVEMENT COUNTS

(Cars and Trucks)

DATE: September 25, 2019 (Wednesday)

CITY: Leesburg

LATITUDE: 0

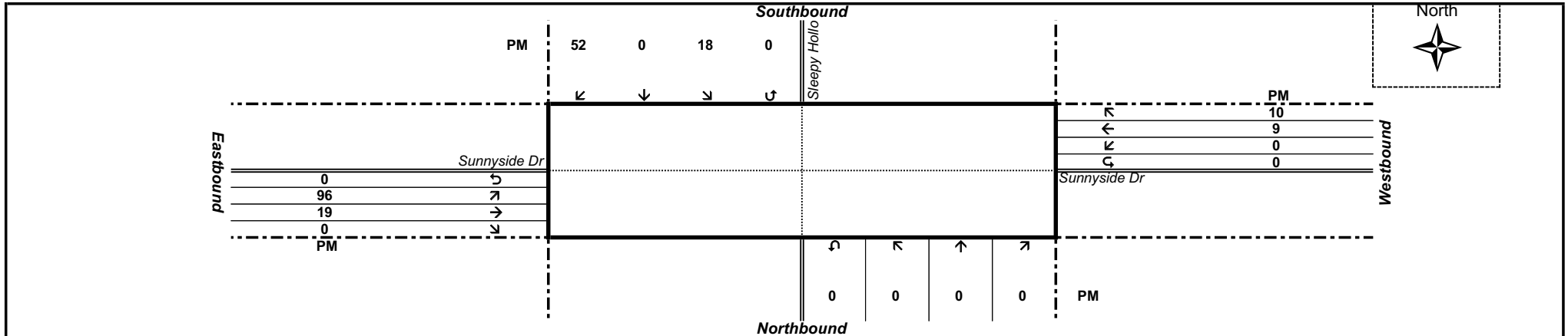
LOCATION: Sleepy Hollow Rd & Sunnyside Dr

COUNTY: Lake County

LONGITUDE: 0

						Sleepy Hollow Rd					Sunnyside Dr					Sunnyside Dr							
TIME BEGIN	NORTHBOUND					SOUTHBOUND					N/S TOTAL	EASTBOUND					WESTBOUND					E/W TOTAL	GRAND TOTAL
	L	T	R	U-turn	TOTAL	L	T	R	U-turn	TOTAL		L	T	R	U-turn	TOTAL	L	T	R	U-turn	TOTAL		
04:00 PM	0	0	0	0	0	4	0	14	0	18	18	16	4	0	0	20	0	5	2	0	7	27	45
04:15 PM	0	0	0	0	0	1	0	13	0	14	14	15	4	0	0	19	0	1	1	0	2	21	35
04:30 PM	0	0	0	0	0	2	0	13	0	15	15	19	4	0	0	23	0	1	2	0	3	26	41
04:45 PM	0	0	0	0	0	3	0	9	0	12	12	15	2	0	0	17	0	0	0	0	0	17	29
TOTAL	0	0	0	0	0	10	0	49	0	59	59	65	14	0	0	79	0	7	5	0	12	91	150
05:00 PM	0	0	0	0	0	4	0	19	0	23	23	29	7	0	0	36	0	3	1	0	4	40	63
05:15 PM	0	0	0	0	0	5	0	13	0	18	18	21	3	0	0	24	0	2	6	0	8	32	50
05:30 PM	0	0	0	0	0	6	0	8	0	14	14	17	3	0	0	20	0	2	2	0	4	24	38
05:45 PM	0	0	0	0	0	3	0	12	0	15	15	29	6	0	0	35	0	2	1	0	3	38	53
TOTAL	0	0	0	0	0	18	0	52	0	70	70	96	19	0	0	115	0	9	10	0	19	134	204

PM Peak																				Peak Hour Factor: 0.810			
05:00 PM to	0	0	0	0	0	18	0	52	0	70	70	96	19	0	0	115	0	9	10	0	19	134	204
06:00 PM																							



(Trucks Only)

LATITUDE: 0

LONGITUDE: 0

[illegible]

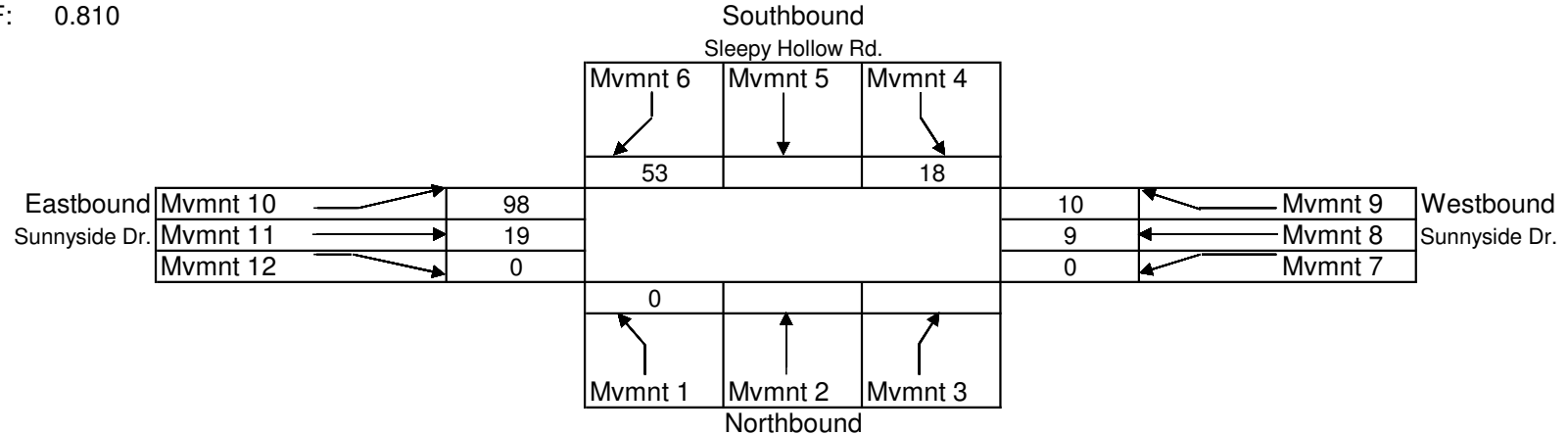
ADJUSTED TURNING MOVEMENT COUNT
PM PEAK HOUR

(N/S) STREET: Sleepy Hollow Rd.
(E/W) STREET: Sunnyside Dr.

Date of Count: 09/25/19
Seasonal Adjustment Factor: 1.02

PEAK HOUR VOLUMES (Raw)											
Northbound			Southbound			Eastbound			Westbound		
Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn
0	0	0	18	0	52	96	19	0	0	9	10

Peak Hour: 5:00 - 6:00 PM
Overall PHF: 0.810

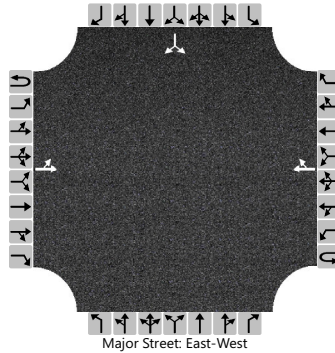


HCS7 Two-Way Stop-Control Report

General Information

Analyst	DAG	Intersection	Sunnyside & Sleepy Hollow
Agency/Co.	Griffey Engineering	Jurisdiction	Leesburg
Date Performed	9/25/19	East/West Street	Sunnyside Drive
Analysis Year	2019	North/South Street	Sleepy Hollow Road
Time Analyzed	5:00-6:00 PM	Peak Hour Factor	0.81
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Sunnyside & Sleepy Hollow - Existing		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		98	19				9	10						18		53
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		121													88	
Capacity, c (veh/h)		1605													922	
v/c Ratio		0.08													0.10	
95% Queue Length, Q ₉₅ (veh)		0.2													0.3	
Control Delay (s/veh)		7.4													9.3	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	6.3												9.3			
Approach LOS													A			

15 MINUTE TURNING MOVEMENT COUNTS

(Cars and Trucks)

DATE: September 25, 2019 (Wednesday)

CITY: Leesburg

LATITUDE: 0

LOCATION: Sleepy Hollow Rd/CR 44 & US 441

COUNTY: Lake County

LONGITUDE: 0

Sleepy Hollow Rd

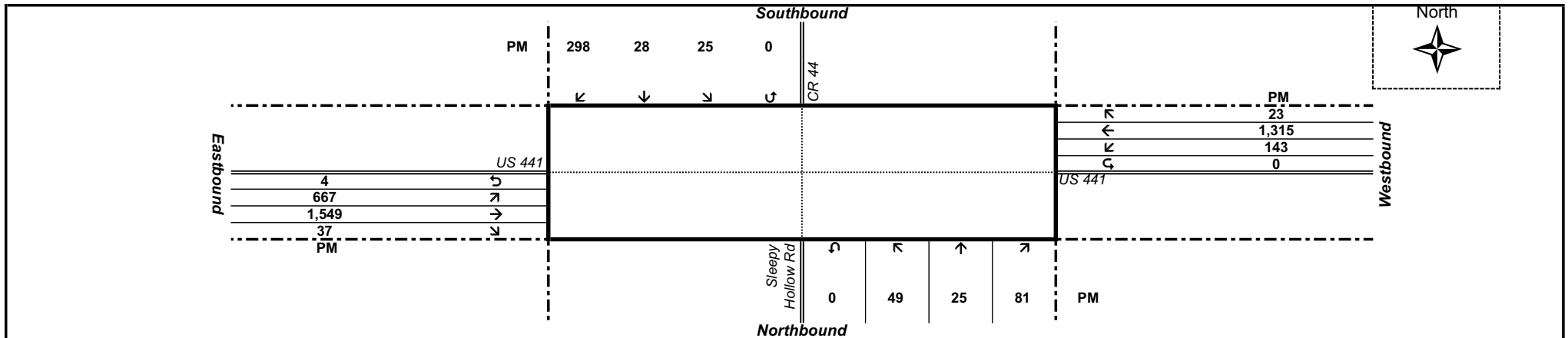
CR 44

US 441

US 441

TIME BEGIN	NORTHBOUND					SOUTHBOUND					N/S TOTAL	EASTBOUND					WESTBOUND					E/W TOTAL	GRAND TOTAL
	L	T	R	U-turn	TOTAL	L	T	R	U-turn	TOTAL		L	T	R	U-turn	TOTAL	L	T	R	U-turn	TOTAL		
04:00 PM	13	4	19	0	36	7	9	74	0	90	126	128	342	13	0	483	23	349	6	0	378	861	987
04:15 PM	10	5	24	0	39	6	5	83	0	94	133	136	303	3	0	442	22	278	8	1	309	751	884
04:30 PM	5	1	19	0	25	5	9	77	0	91	116	130	347	5	0	482	28	338	5	0	371	853	969
04:45 PM	10	7	16	0	33	7	5	66	0	78	111	160	357	10	0	527	37	343	7	0	387	914	1,025
TOTAL	38	17	78	0	133	25	28	300	0	353	486	554	1,349	31	0	1,934	110	1,308	26	1	1,445	3,379	3,865
05:00 PM	10	11	19	0	40	8	10	67	0	85	125	170	405	7	2	584	33	369	4	0	406	990	1,115
05:15 PM	11	6	23	0	40	3	6	84	0	93	133	175	405	7	2	589	42	321	2	0	365	954	1,087
05:30 PM	18	1	23	0	42	7	7	81	0	95	137	162	382	13	0	557	31	282	10	0	323	880	1,017
05:45 PM	12	6	23	0	41	9	2	70	0	81	122	113	349	19	0	481	32	265	7	0	304	785	907
TOTAL	51	24	88	0	163	27	25	302	0	354	517	620	1,541	46	4	2,211	138	1,237	23	0	1,398	3,609	4,126

PM Peak		Peak Hour Factor: 0.952																						
04:45 PM to 05:45 PM		49	25	81	0	155	25	28	298	0	351	506	667	1,549	37	4	2,257	143	1,315	23	0	1,481	3,738	4,244



15 MINUTE TURNING MOVEMENT COUNTS

(Trucks Only)

DATE: September 25, 2019 (Wednesday)

CITY: Leesburg

LATITUDE: 0

LOCATION: Sleepy Hollow Rd/CR 44 & US 441

COUNTY: Lake County

LONGITUDE: 0

Sleepy Hollow Rd

CR 44

US 441

US 441

TIME BEGIN	NORTHBOUND					SOUTHBOUND					N/S TOTAL	EASTBOUND					WESTBOUND					E/W TOTAL	GRAND TOTAL
	L	T	R	U-turn	TOTAL	L	T	R	U-turn	TOTAL		L	T	R	U-turn	TOTAL	L	T	R	U-turn	TOTAL		
04:00 PM	0	0	0	0	0	0	0	2	0	2	2	2	3	0	0	5	1	5	0	0	6	11	13
04:15 PM	0	0	0	0	0	0	0	6	0	6	6	3	2	0	0	5	0	3	0	0	3	8	14
04:30 PM	0	0	0	0	0	0	0	4	0	4	4	3	3	0	0	6	0	7	0	0	7	13	17
04:45 PM	0	0	0	0	0	0	0	2	0	2	2	0	3	0	0	3	0	8	0	0	8	11	13
TOTAL	0	0	0	0	0	0	0	14	0	14	14	8	11	0	0	19	1	23	0	0	24	43	57
05:00 PM	0	1	0	0	1	0	0	0	0	0	1	1	5	0	0	6	0	3	0	0	3	9	10
05:15 PM	0	0	0	0	0	0	0	1	0	1	1	1	5	0	0	6	0	5	0	0	5	11	12
05:30 PM	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	1	0	2	0	0	2	3	4
05:45 PM	0	0	0	0	0	0	0	2	0	2	2	0	4	0	0	4	0	4	0	0	4	8	10
TOTAL	0	1	0	0	1	0	0	4	0	4	5	3	14	0	0	17	0	14	0	0	14	31	36

PM Peak																							
04:45 PM to 05:45 PM	0	1	0	0	1	0	0	4	0	4	5	3	13	0	0	16	0	18	0	0	18	34	39

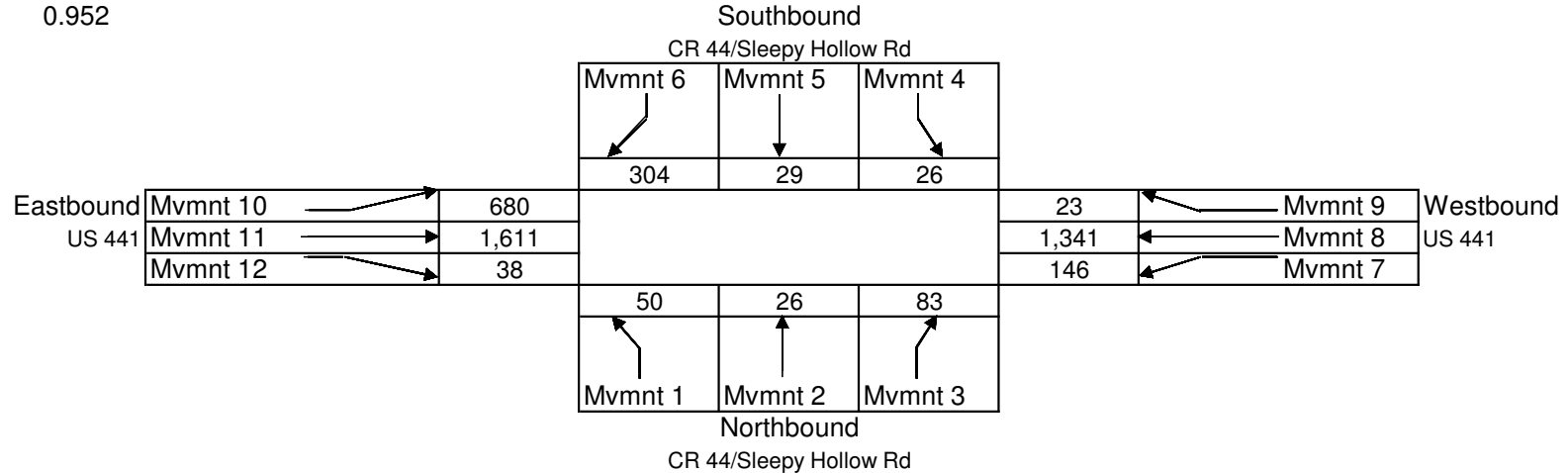
ADJUSTED TURNING MOVEMENT COUNT
PM PEAK HOUR

(N/S) STREET: CR 44/Sleepy Hollow Rd
(E/W) STREET: US 441

Date of Count: 09/25/19
Seasonal Adjustment Factor: 1.02

PEAK HOUR VOLUMES (Raw)											
Northbound			Southbound			Eastbound			Westbound		
Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn
49	25	81	25	28	298	667	1,579	37	143	1,315	23

Peak Hour: 4:45 - 5:45 AM
Overall PHF: 0.952



CARTEGRAPH ID: LE-S-069

DATE: 06/20/2018

INTERSECTION NAME AND ID#: US 441 & CR44(Sleepy Hollow Road) 016

PHASE	1	2	3	4	5	6	7	8
	EBL	WB	SBL	NB	WBL	EB	NBL	SB
INITIAL	5	15	5	8	5	15	5	8
PASSAGE	3	3	3	3	3	3	3	3
YELLOW	5.1	5.1	5.5	5.5	5.1	5.1	5.5	5.5
RED CLEAR	4.9	2.3	3.5	3.2	5.5	2.3	4.1	3.2
MAX 1	25	50	15	30	20	50	15	30
MAX 2								
WALK		7		7		7		
DON'T WALK		26		47		36		
RECALL		Min				Min		
DET. FUNC.		L				L		

PREEMPTION TIMING

	COORD + PREEMPT	DELAY (sec)	MIN DURATION (Sec.)	MAX PRESENCE (Sec.)	MIN GREEN (Sec.)	TRACK GREEN (Sec.)	MIN DWELL (Sec.)	
	OFF		10	60	10		10	

SYSTEM TIMING

PATTERN		CYCLE	OFFSET	COORDINATED		BASE DAY 1		BASE DAY 2	
		Sec	Sec	Phase	Sequence	Mon.- Fri.		Sat. - Sun	
	1								
	2								
	3								
	5								
	6								

SPLIT ALLOCATION - Sec

PHASE	1	2	3	4	5	6	7	8
1								
2								
3								
5								
6								

NOTES: Naztec 980 AO300-1 V61.2H

1) Stop in Walk Feature activated

Intersection operates in "free" mode

Stop in Walk feature Activated

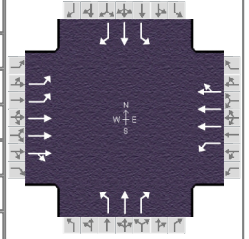
HCS7 Signalized Intersection Results Summary

General Information

Agency	Griffey Engineering
Analyst	DAG
Jurisdiction	Leesburg
Urban Street	US 441
Intersection	US 441 & CR 44/Sleepy...
Project Description	Existing

Intersection Information

Duration, h	0.250
Area Type	Other
PHF	0.95
Analysis Period	1> 7:00
File Name	US 441 & CR44-Sleepy Hollow - Existing.xus

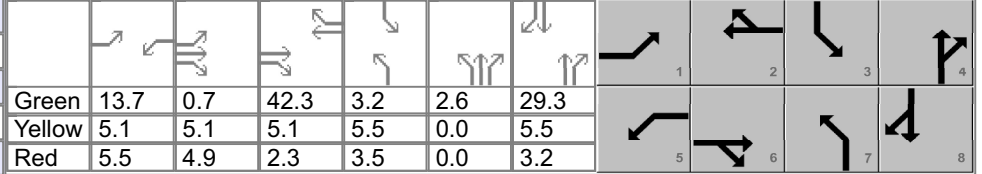


Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	680	1611	38	146	1341	23	50	26	83	26	29	304

Signal Information

Cycle, s	137.5	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7	4	3	8
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	35.0	60.4	24.3	49.7	14.8	40.5	12.2	38.0
Change Period, ($Y+R_c$), s	10.0	7.4	10.6	7.4	9.6	8.7	9.0	8.7
Max Allow Headway (MAH), s	3.9	3.8	3.9	3.8	3.9	4.1	3.9	4.1
Queue Clearance Time (g_s), s	27.0	39.6	13.5	34.5	6.0	8.1	4.1	29.1
Green Extension Time (g_e), s	0.0	8.3	0.2	7.8	0.1	1.7	0.0	0.1
Phase Call Probability	1.00	1.00	1.00	1.00	0.87	1.00	0.65	1.00
Max Out Probability	1.00	0.84	0.11	0.74	0.00	0.00	0.00	1.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h	716	1162	574	154	960	476	53	27	87	27	31	320
Adjusted Saturation Flow Rate (s), veh/h/ln	1743	1885	1862	1810	1885	1868	1810	1856	1610	1810	1900	1598
Queue Service Time (g_s), s	25.0	37.6	37.6	11.5	32.5	32.5	4.0	1.6	6.1	2.1	1.8	27.1
Cycle Queue Clearance Time (g_c), s	25.0	37.6	37.6	11.5	32.5	32.5	4.0	1.6	6.1	2.1	1.8	27.1
Green Ratio (g/C)	0.18	0.39	0.39	0.40	0.31	0.31	0.04	0.23	0.23	0.02	0.21	0.21
Capacity (c), veh/h	634	1455	718	180	1160	575	69	430	373	43	404	340
Volume-to-Capacity Ratio (X)	1.129	0.799	0.799	0.854	0.827	0.827	0.767	0.064	0.234	0.641	0.075	0.941
Back of Queue (Q), ft/ln (95 th percentile)	646.4	598.4	606.2	247.7	539.5	548.1	93.7	32.7	106.7	49.6	36.8	493.2
Back of Queue (Q), veh/ln (95 th percentile)	25.7	23.7	24.2	9.9	21.4	21.9	3.7	1.3	4.3	2.0	1.5	19.6
Queue Storage Ratio (RQ) (95 th percentile)	2.09	1.50	1.53	1.24	1.35	1.38	0.78	0.27	0.89	0.19	0.14	3.08
Uniform Delay (d_1), s/veh	56.2	37.5	37.5	60.9	44.2	44.2	65.5	41.2	42.9	66.5	43.3	53.3
Incremental Delay (d_2), s/veh	76.8	3.2	6.4	16.3	3.8	7.3	16.2	0.1	0.3	14.9	0.1	32.9
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	133.1	40.7	43.9	77.2	48.0	51.5	81.7	41.3	43.2	81.4	43.4	86.2
Level of Service (LOS)	F	D	D	E	D	D	F	D	D	F	D	F
Approach Delay, s/veh / LOS	68.4	E	E	51.8	D	D	55.0	E	E	82.4	F	F
Intersection Delay, s/veh / LOS	63.3						E					

Multimodal Results

	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

APPENDIX D

FUTURE INTERSECTION ANALYSIS

PM PEAK HOUR PROJECT TURNING MOVEMENTS

Project Inbound Volume: 137	Project Outbound Volume: 80
-----------------------------	-----------------------------

	Sunnyside Drive						E. Main St.					
	Northbound			Southbound			Eastbound			Westbound		
	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn
% Distrib.	57%	0%	0%	0%	25%	0%	0%	0%	32%	0%	0%	0%
Volume	46	0	0	0	34	0	0	0	44	0	0	0

	Sleepy Hollow Rd.						Sunnyside Dr.					
	Northbound			Southbound			Eastbound			Westbound		
	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn
% Distrib.	0%	0%	0%	43%	0%	0%	0%	57%	0%	0%	57%	43%
Volume	0	0	0	59	0	0	0	78	0	0	46	34

	CR 44/Sleepy Hollow Rd						US 441					
	Northbound			Southbound			Eastbound			Westbound		
	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn
% Distrib.	3%	11%	29%	0%	11%	0%	0%	0%	3%	29%	0%	0%
Volume	2	9	23	0	15	0	0	0	4	40	0	0

TURNING MOVEMENT BACKGROUND GROWTH CALCULATOR

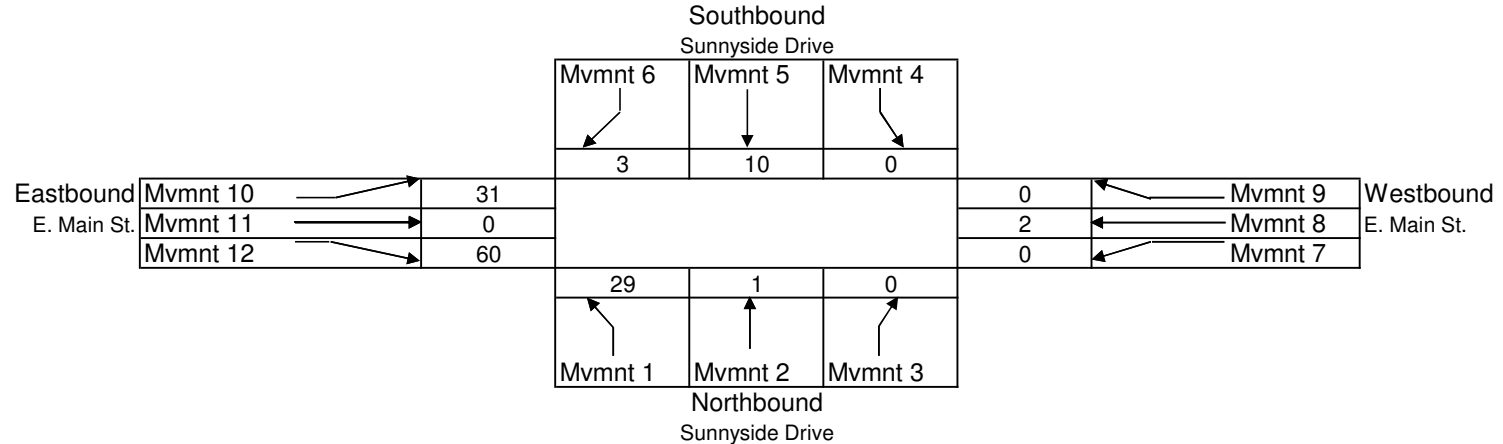
PM PEAK HOUR

(N/S) STREET: Sunnyside Drive
(E/W) STREET: E. Main St.

Annual Growth Rate: 3.50%
Annual Growth Rate: 6.62%

Current Year: 2019
Future Year: 2024

PEAK HOUR VOLUMES (Adjusted)											
Northbound			Southbound			Eastbound			Westbound		
Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn
166	7	1	1	59	19	94	1	182	0	5	0
17.50%	17.50%	17.50%	17.50%	17.50%	17.50%	33.10%	33.10%	33.10%	33.10%	33.10%	33.10%

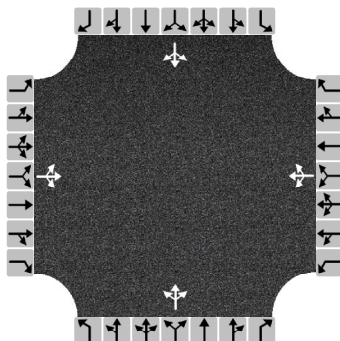


HCS7 All-Way Stop Control Report

General Information

Analyst	DAG	Intersection	E. Main St & Sunnyside Dr
Agency/Co.	Griffey Engineering	Jurisdiction	Leesburg
Date Performed	9/25/19	East/West Street	E. Main Street
Analysis Year	2019	North/South Street	Sunnyside Drive
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.91
Time Analyzed	4:45-5:45 PM		
Project Description	E. Main St. & Sunnyside Dr. - Future w/ Project		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	125	1	286	0	7	0	241	8	1	1	103	22
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	452			8			274			138		
Percent Heavy Vehicles	0			1			0			1		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.402			0.007			0.244			0.123		
Final Departure Headway, hd (s)	4.71			5.76			5.46			5.41		
Final Degree of Utilization, x	0.591			0.012			0.416			0.208		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, ts (s)	2.71			3.76			3.46			3.41		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	452			8			274			138		
Capacity	765			625			659			665		
95% Queue Length, Q ₉₅ (veh)	3.9			0.0			2.1			0.8		
Control Delay (s/veh)	14.3			8.8			12.3			9.8		
Level of Service, LOS	B			A			B			A		
Approach Delay (s/veh)	14.3			8.8			12.3			9.8		
Approach LOS	B			A			B			A		
Intersection Delay, s/veh LOS	12.9						B					

TURNING MOVEMENT BACKGROUND GROWTH CALCULATOR

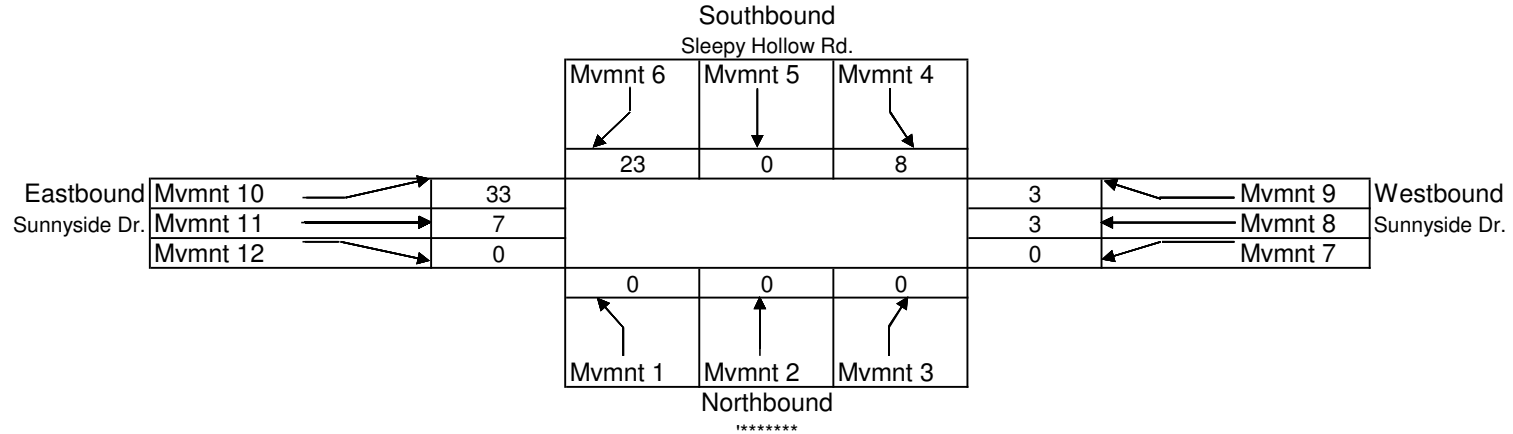
PM PEAK HOUR

(N/S) STREET: Sleepy Hollow Rd.
(E/W) STREET: Sunnyside Dr.

Annual Growth Rate: 8.83%
Annual Growth Rate: 6.80%

Current Year: 2019
Future Year: 2024

PEAK HOUR VOLUMES (Adjusted)											
Northbound			Southbound			Eastbound			Westbound		
Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn
0	0	0	18	0	53	98	19	0	0	9	10
44.15%	44.15%	44.15%	44.15%	44.15%	44.15%	34.00%	34.00%	34.00%	34.00%	34.00%	34.00%



HCS7 Two-Way Stop-Control Report

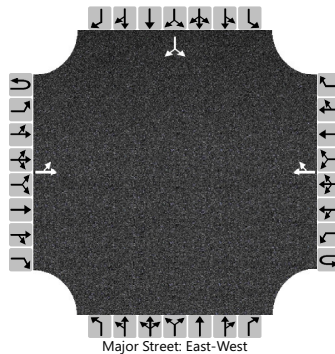
General Information

Analyst	DAG
Agency/Co.	Griffey Engineering
Date Performed	9/25/19
Analysis Year	2019
Time Analyzed	5:00-6:00 PM
Intersection Orientation	East-West
Project Description	Sunnyside & Sleepy Hollow - Future w/ Project

Site Information

Intersection	Sunnyside & Sleepy Hollow
Jurisdiction	Leesburg
East/West Street	Sunnyside Drive
North/South Street	Sleepy Hollow Road
Peak Hour Factor	0.81
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		131	104				58	47						85		76
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		162													199	
Capacity, c (veh/h)		1468													590	
v/c Ratio		0.11													0.34	
95% Queue Length, Q ₉₅ (veh)		0.4													1.5	
Control Delay (s/veh)		7.8													14.2	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	4.7												14.2			
Approach LOS													B			

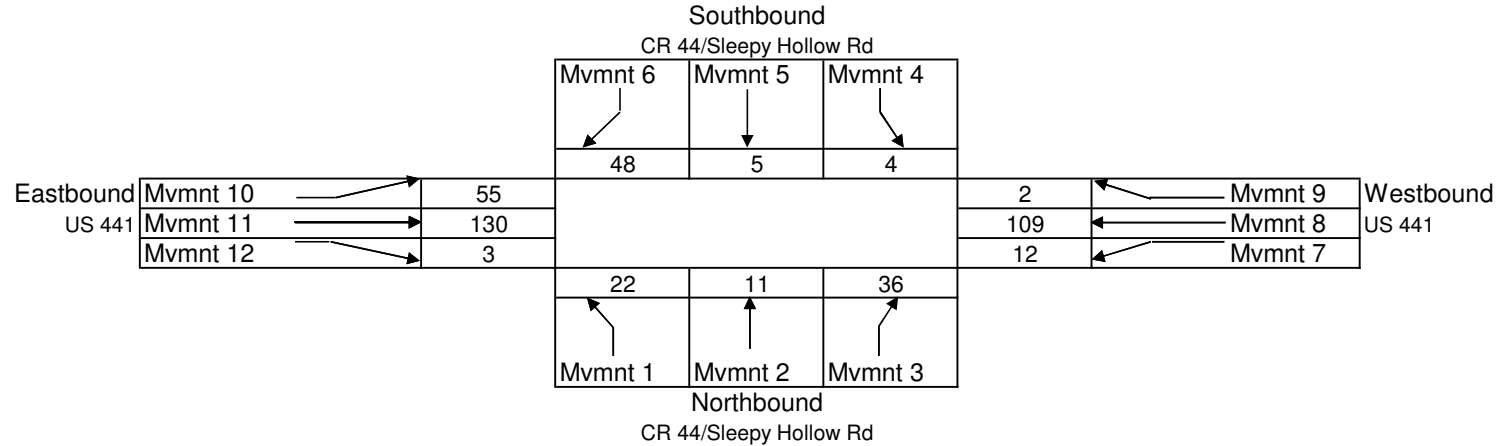
TURNING MOVEMENT BACKGROUND GROWTH CALCULATOR

PM PEAK HOUR

(N/S) STREET: CR 44/Sleepy Hollow Rd Annual Growth Rate: 3.16% 8.83%
 (E/W) STREET: US 441 Annual Growth Rate: 1.62%

Current Year: 2019
 Future Year: 2024

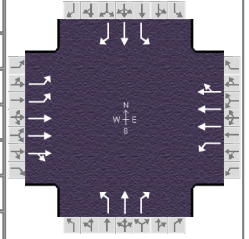
PEAK HOUR VOLUMES (Adjusted)											
Northbound			Southbound			Eastbound			Westbound		
Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn
50	26	83	26	29	304	680	1,611	38	146	1,341	23
44.15%	44.15%	44.15%	15.80%	15.80%	15.80%	8.10%	8.10%	8.10%	8.10%	8.10%	8.10%



HCS7 Signalized Intersection Results Summary

General Information

Agency	Griffey Engineering			Duration, h	0.250
Analyst	DAG	Analysis Date	Sep 25, 2019	Area Type	Other
Jurisdiction	Leesburg	Time Period	4:45-5:45 PM	PHF	0.95
Urban Street	US 441	Analysis Year	2019	Analysis Period	1> 7:00
Intersection	US 441 & CR 44/Sleepy...	File Name	US 441 & CR44-Sleepy Hollow - Future w Project...		
Project Description	Future w/ Project				



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	735	1741	45	198	1450	25	74	36	142	30	49	352

Signal Information

Cycle, s	144.6	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On	Green	18.5	5.9	46.0	3.6	4.9	30.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	5.1	0.0	5.1	5.5	0.0	5.5		
				Red	5.5	0.0	2.3	3.5	0.0	3.2		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7	4	3	8
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	35.0	59.3	29.1	53.4	17.5	43.6	12.6	38.7
Change Period, (Y+R _c), s	10.0	7.4	10.6	7.4	9.6	8.7	9.0	8.7
Max Allow Headway (MAH), s	3.9	3.8	3.9	3.8	3.9	4.1	3.9	4.1
Queue Clearance Time (g _s), s	27.0	48.5	18.4	39.5	8.1	13.2	4.5	32.0
Green Extension Time (g _e), s	0.0	1.4	0.1	6.5	0.1	2.1	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	0.96	1.00	0.72	1.00
Max Out Probability	1.00	1.00	1.00	0.88	0.04	0.02	0.00	1.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h	774	1259	621	208	1038	514	78	38	149	32	52	371
Adjusted Saturation Flow Rate (s), veh/h/ln	1743	1885	1860	1810	1885	1868	1810	1856	1610	1810	1900	1598
Queue Service Time (g _s), s	25.0	46.4	46.5	16.4	37.5	37.5	6.1	2.3	11.2	2.5	3.2	30.0
Cycle Queue Clearance Time (g _c), s	25.0	46.4	46.5	16.4	37.5	37.5	6.1	2.3	11.2	2.5	3.2	30.0
Green Ratio (g/C)	0.17	0.36	0.36	0.13	0.32	0.32	0.05	0.24	0.24	0.02	0.21	0.21
Capacity (c), veh/h	603	1353	668	232	1200	594	99	448	388	45	394	332
Volume-to-Capacity Ratio (X)	1.283	0.930	0.931	0.900	0.865	0.866	0.791	0.085	0.385	0.702	0.131	1.118
Back of Queue (Q), ft/ln (95 th percentile)	850.4	768.5	799.1	356.6	620.6	636.5	140.5	47.6	196.8	60.9	67	714.3
Back of Queue (Q), veh/ln (95 th percentile)	33.7	30.5	32.0	14.3	24.6	25.5	5.6	1.9	7.9	2.4	2.7	28.3
Queue Storage Ratio (RQ) (95 th percentile)	2.74	1.92	2.01	1.78	1.55	1.60	1.17	0.40	1.64	0.23	0.26	4.46
Uniform Delay (d ₁), s/veh	59.8	44.6	44.6	62.1	46.4	46.4	67.5	42.5	45.9	70.0	46.7	57.3
Incremental Delay (d ₂), s/veh	139.7	11.5	19.8	30.6	6.0	11.2	13.1	0.1	0.6	18.0	0.1	85.0
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	199.5	56.1	64.4	92.7	52.4	57.6	80.6	42.6	46.5	87.9	46.8	142.3
Level of Service (LOS)	F	E	E	F	D	E	F	D	D	F	D	F
Approach Delay, s/veh / LOS	99.9	F		58.7	E		56.0	E		127.7	F	
Intersection Delay, s/veh / LOS	85.9						F					

Multimodal Results

	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

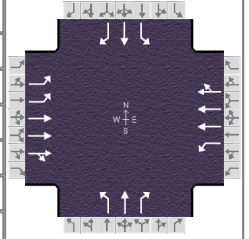
HCS7 Signalized Intersection Results Summary

General Information

Agency	Griffey Engineering
Analyst	DAG
Jurisdiction	Leesburg
Urban Street	US 441
Intersection	US 441 & CR 44/Sleepy...
Project Description	Future w/o Project

Intersection Information

Duration, h	0.250
Area Type	Other
PHF	0.95
Analysis Period	1> 7:00
File Name	US 441 & CR44-Sleepy Hollow - Future wo Proje...



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	735	1741	41	158	1450	25	72	27	119	30	34	352

Signal Information

Cycle, s	142.3	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7	4	3	8
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	35.0	60.8	25.7	51.5	17.2	43.3	12.6	38.7
Change Period, ($Y+R_c$), s	10.0	7.4	10.6	7.4	9.6	8.7	9.0	8.7
Max Allow Headway (MAH), s	3.9	3.8	3.9	3.8	3.9	4.1	3.9	4.1
Queue Clearance Time (g_s), s	27.0	46.5	14.9	39.3	7.9	11.1	4.5	32.0
Green Extension Time (g_e), s	0.0	3.3	0.2	4.7	0.1	2.0	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	0.95	1.00	0.71	1.00
Max Out Probability	1.00	1.00	0.38	0.87	0.03	0.01	0.00	1.00

Movement Group Results

Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h	774	1255	621	166	1038	514	76	28	125	32	36	371
Adjusted Saturation Flow Rate (s), veh/h/ln	1743	1885	1862	1810	1885	1868	1810	1856	1610	1810	1900	1598
Queue Service Time (g_s), s	25.0	44.4	44.5	12.9	37.3	37.3	5.9	1.7	9.1	2.5	2.2	30.0
Cycle Queue Clearance Time (g_c), s	25.0	44.4	44.5	12.9	37.3	37.3	5.9	1.7	9.1	2.5	2.2	30.0
Green Ratio (g/C)	0.18	0.38	0.38	0.11	0.31	0.31	0.05	0.24	0.24	0.03	0.21	0.21
Capacity (c), veh/h	612	1415	699	191	1167	578	96	451	391	45	400	337
Volume-to-Capacity Ratio (X)	1.263	0.887	0.888	0.869	0.889	0.889	0.787	0.063	0.320	0.697	0.089	1.100
Back of Queue (Q), ft/ln (95 th percentile)	827.3	715.4	737.6	278.7	623.9	642.5	134.7	34.8	160.6	59.8	45.1	693.3
Back of Queue (Q), veh/ln (95 th percentile)	32.8	28.4	29.5	11.1	24.8	25.7	5.4	1.4	6.4	2.4	1.8	27.5
Queue Storage Ratio (RQ) (95 th percentile)	2.67	1.79	1.86	1.39	1.56	1.62	1.12	0.29	1.34	0.23	0.17	4.33
Uniform Delay (d_1), s/veh	58.7	41.6	41.7	62.7	46.8	46.8	66.6	41.4	44.2	68.9	45.2	56.2
Incremental Delay (d_2), s/veh	131.3	7.2	13.3	21.0	7.2	13.1	13.1	0.1	0.5	17.5	0.1	78.8
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	190.0	48.9	55.0	83.7	54.0	59.9	79.7	41.5	44.7	86.3	45.3	135.0
Level of Service (LOS)	F	D	E	F	D	E	E	D	D	F	D	F
Approach Delay, s/veh / LOS	91.5	F		58.6	E		55.9	E		124.1	F	
Intersection Delay, s/veh / LOS	81.5						F					

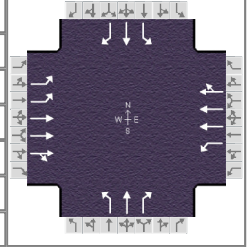
Multimodal Results

	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

HCS7 Signalized Intersection Results Summary

General Information

Agency	Griffey Engineering			Duration, h	0.250
Analyst	DAG	Analysis Date	Sep 25, 2019	Area Type	Other
Jurisdiction	Leesburg	Time Period	4:45-5:45 PM	PHF	0.95
Urban Street	US 441	Analysis Year	2019	Analysis Period	1 > 7:00
Intersection	US 441 & CR 44/Sleepy...	File Name	US 441 & CR44-Sleepy Hollow - Existing - w Impr...		
Project Description	Existing w/ Improvement				



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	680	1611	38	146	1341	23	50	26	83	26	29	304

Signal Information

Cycle, s	119.9	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On	Green	12.2	5.8	43.1	3.0	2.1	8.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	5.1	5.1	5.1	5.5	0.0	5.5		
				Red	5.5	4.9	2.3	3.5	0.0	3.2		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7	4	3	8
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	38.5	66.3	22.8	50.5	14.1	18.8	12.0	16.7
Change Period, ($Y+R_c$), s	10.0	7.4	10.6	7.4	9.6	8.7	9.0	8.7
Max Allow Headway (MAH), s	3.9	3.8	3.9	3.8	3.9	4.1	3.9	4.1
Queue Clearance Time (g_s), s	25.6	29.2	12.0	28.2	5.5	8.3	3.8	10.0
Green Extension Time (g_e), s	2.9	21.0	0.2	14.8	0.0	1.8	0.0	0.0
Phase Call Probability	1.00	1.00	0.99	1.00	0.83	1.00	0.60	1.00
Max Out Probability	0.00	0.40	0.03	0.63	1.00	0.00	1.00	1.00

Movement Group Results

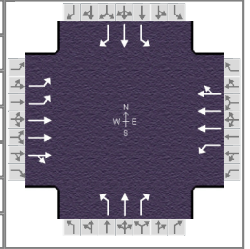
	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h	716	1162	574	154	960	476	53	27	87	27	31	320
Adjusted Saturation Flow Rate (s), veh/h/ln	1743	1885	1862	1810	1885	1868	1810	1856	1610	1810	1900	1598
Queue Service Time (g_s), s	23.6	27.2	27.2	10.0	26.2	26.2	3.5	1.6	6.3	1.8	1.8	8.0
Cycle Queue Clearance Time (g_c), s	23.6	27.2	27.2	10.0	26.2	26.2	3.5	1.6	6.3	1.8	1.8	8.0
Green Ratio (g/C)	0.24	0.49	0.49	0.10	0.36	0.36	0.04	0.08	0.08	0.02	0.07	0.31
Capacity (c), veh/h	831	1851	914	184	1356	672	68	157	136	45	127	487
Volume-to-Capacity Ratio (X)	0.862	0.628	0.628	0.835	0.708	0.708	0.770	0.175	0.642	0.605	0.241	0.657
Back of Queue (Q), ft/ln (95 th percentile)	382.3	414.1	410.5	212	426.7	427.3	89.3	34.9	118.4	42.5	39.3	321.4
Back of Queue (Q), veh/ln (95 th percentile)	15.2	16.4	16.4	8.5	16.9	17.1	3.6	1.4	4.7	1.7	1.6	12.8
Queue Storage Ratio (RQ) (95 th percentile)	1.23	1.04	1.03	1.06	1.07	1.08	0.74	0.29	0.99	0.16	0.15	2.01
Uniform Delay (d_1), s/veh	43.8	22.5	22.5	52.9	33.0	33.0	57.2	51.0	53.1	57.9	53.1	36.2
Incremental Delay (d_2), s/veh	3.2	0.5	0.9	10.0	1.2	2.5	24.5	0.5	5.0	12.3	1.0	3.2
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	47.0	22.9	23.4	62.9	34.2	35.5	81.7	51.5	58.1	70.2	54.1	39.4
Level of Service (LOS)	D	C	C	E	C	D	F	D	E	E	D	D
Approach Delay, s/veh / LOS	30.1	C		37.4	D		64.4	E		42.8	D	
Intersection Delay, s/veh / LOS	34.9						C					

Multimodal Results

	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Griffey Engineering			Duration, h	0.250
Analyst	DAG	Analysis Date	Sep 25, 2019	Area Type	Other
Jurisdiction	Leesburg	Time Period	4:45-5:45 PM	PHF	0.95
Urban Street	US 441	Analysis Year	2019	Analysis Period	1> 7:00
Intersection	US 441 & CR 44/Sleepy...	File Name	US 441 & CR44-Sleepy Hollow - Future wo Proje...		
Project Description	Future w/o Project w/ Improvement				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	735	1741	41	158	1450	25	72	27	119	30	34	352

Signal Information												
Cycle, s	120.6	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On	Green	13.1	7.2	39.6	3.3	3.8	8.0		
				Yellow	5.1	5.1	5.1	5.5	0.0	5.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	5.5	4.9	2.3	3.5	0.0	3.2		

												
1	2	3	4	5	6	7	8	9	10	11	12	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7	4	3	8
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	40.9	64.2	23.7	47.0	16.1	20.5	12.3	16.7
Change Period, ($Y+R_c$), s	10.0	7.4	10.6	7.4	9.6	8.7	9.0	8.7
Max Allow Headway (MAH), s	3.9	3.8	3.9	3.8	3.9	4.1	3.9	4.1
Queue Clearance Time (g_s), s	27.6	33.9	12.9	32.8	7.0	11.2	4.1	10.0
Green Extension Time (g_e), s	3.3	22.8	0.3	0.0	0.0	0.5	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	0.92	1.00	0.65	1.00
Max Out Probability	0.00	0.18	0.03	1.00	1.00	1.00	1.00	1.00

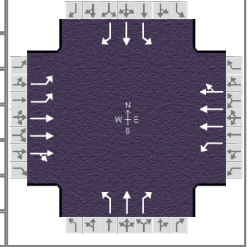
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h	774	1255	621	166	1038	514	76	28	125	32	36	371
Adjusted Saturation Flow Rate (s), veh/h/ln	1743	1885	1862	1810	1885	1868	1810	1856	1610	1810	1900	1598
Queue Service Time (g_s), s	25.6	31.9	31.9	10.9	30.8	30.8	5.0	1.7	9.2	2.1	2.2	8.0
Cycle Queue Clearance Time (g_c), s	25.6	31.9	31.9	10.9	30.8	30.8	5.0	1.7	9.2	2.1	2.2	8.0
Green Ratio (g/C)	0.26	0.47	0.47	0.11	0.33	0.33	0.05	0.10	0.10	0.03	0.07	0.32
Capacity (c), veh/h	893	1774	876	197	1238	613	97	181	157	49	126	515
Volume-to-Capacity Ratio (X)	0.867	0.708	0.708	0.845	0.839	0.839	0.782	0.157	0.796	0.644	0.284	0.719
Back of Queue (Q), ft/ln (95 th percentile)	407.8	478.7	474.3	228.4	512.3	529	126.3	35.8	198	49.5	46.7	373.7
Back of Queue (Q), veh/ln (95 th percentile)	16.2	19.0	19.0	9.1	20.3	21.2	5.1	1.4	7.9	2.0	1.9	14.8
Queue Storage Ratio (RQ) (95 th percentile)	1.32	1.20	1.20	1.14	1.28	1.33	1.05	0.30	1.65	0.19	0.18	2.34
Uniform Delay (d_1), s/veh	42.9	25.4	25.4	52.8	37.6	37.6	56.4	49.9	53.3	58.1	53.6	36.1
Incremental Delay (d_2), s/veh	3.2	0.5	1.1	11.1	5.3	10.0	22.8	0.4	20.6	13.3	1.2	4.8
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	46.1	25.9	26.4	63.9	42.9	47.6	79.2	50.3	73.8	71.4	54.8	40.9
Level of Service (LOS)	D	C	C	E	D	D	E	D	E	E	D	D
Approach Delay, s/veh / LOS	31.9		C	46.3		D	72.7		E	44.3		D
Intersection Delay, s/veh / LOS	39.8						D					

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS												
Bicycle LOS Score / LOS												

HCS7 Signalized Intersection Results Summary

General Information

Agency	Griffey Engineering			Duration, h	0.250
Analyst	DAG	Analysis Date	Sep 25, 2019	Area Type	Other
Jurisdiction	Leesburg	Time Period	4:45-5:45 PM	PHF	0.95
Urban Street	US 441	Analysis Year	2019	Analysis Period	1 > 7:00
Intersection	US 441 & CR 44/Sleepy...	File Name	US 441 & CR44-Sleepy Hollow - Future w Project...		
Project Description	Future w/ Project w/ Improvement				



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	735	1741	45	198	1450	25	74	36	142	30	49	352

Signal Information

Cycle, s	125.5	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On	Green	16.5	4.9	42.2	3.3	4.1	8.9		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	5.1	5.1	5.1	5.5	0.0	5.5		
				Red	5.5	4.9	2.3	3.5	0.0	3.2		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6	5	2	7	4	3	8
Case Number	2.0	4.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	41.9	64.4	27.1	49.6	16.5	21.7	12.3	17.6
Change Period, ($Y+R_c$), s	10.0	7.4	10.6	7.4	9.6	8.7	9.0	8.7
Max Allow Headway (MAH), s	3.9	3.8	3.9	3.8	3.9	4.1	3.9	4.1
Queue Clearance Time (g_s), s	28.7	36.4	16.2	33.7	7.3	13.5	4.2	10.9
Green Extension Time (g_e), s	3.2	20.6	0.3	0.0	0.0	0.0	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	0.93	1.00	0.67	1.00
Max Out Probability	0.00	0.19	0.53	1.00	1.00	1.00	1.00	1.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h	774	1259	621	208	1038	514	78	38	149	32	52	371
Adjusted Saturation Flow Rate (s), veh/h/ln	1743	1885	1860	1810	1885	1868	1810	1856	1610	1810	1900	1598
Queue Service Time (g_s), s	26.7	34.3	34.4	14.2	31.7	31.7	5.3	2.3	11.5	2.2	3.3	8.9
Cycle Queue Clearance Time (g_c), s	26.7	34.3	34.4	14.2	31.7	31.7	5.3	2.3	11.5	2.2	3.3	8.9
Green Ratio (g/C)	0.25	0.45	0.45	0.13	0.34	0.34	0.05	0.10	0.10	0.03	0.07	0.33
Capacity (c), veh/h	887	1713	845	237	1266	627	99	192	167	48	134	519
Volume-to-Capacity Ratio (X)	0.872	0.735	0.735	0.878	0.820	0.820	0.787	0.197	0.897	0.656	0.384	0.713
Back of Queue (Q), ft/ln (95 th percentile)	426.8	517.9	513.5	300.9	522.4	535.9	138	49.8	264	51.8	70.7	385.3
Back of Queue (Q), veh/ln (95 th percentile)	16.9	20.6	20.5	12.0	20.7	21.4	5.5	1.9	10.6	2.1	2.8	15.3
Queue Storage Ratio (RQ) (95 th percentile)	1.38	1.29	1.29	1.50	1.31	1.35	1.15	0.41	2.20	0.20	0.27	2.41
Uniform Delay (d_1), s/veh	44.8	28.1	28.1	53.6	38.2	38.2	58.6	51.5	55.6	60.5	55.7	37.2
Incremental Delay (d_2), s/veh	3.7	0.6	1.3	20.4	4.4	8.5	25.9	0.5	41.5	14.1	1.8	4.6
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	48.6	28.7	29.3	74.0	42.6	46.7	84.5	52.0	97.1	74.6	57.5	41.8
Level of Service (LOS)	D	C	C	E	D	D	F	D	F	E	E	D
Approach Delay, s/veh / LOS	34.6	C		47.5	D		87.0	F		45.9	D	
Intersection Delay, s/veh / LOS	42.8						D					

Multimodal Results

	EB	WB	NB	SB
Pedestrian LOS Score / LOS				
Bicycle LOS Score / LOS				