APRIL 2020

River to Sea Transportation
Planning Organization (R2CTPO)
2570 W International Speedway Blvd.
Suite 100
Daytona Beach, FL 32114

FEASIBILITY STUDY FOR TURN LANE IMPROVEMENTS

Clyde Morris Boulevard at Reed Canal Road, Madeline Avenue and Willow Run Boulevard

VHB
250 E. Robinson St.
Orlando, FL 32803

April 2020

Final Report

Feasibility Studies for Turn Lane Improvements

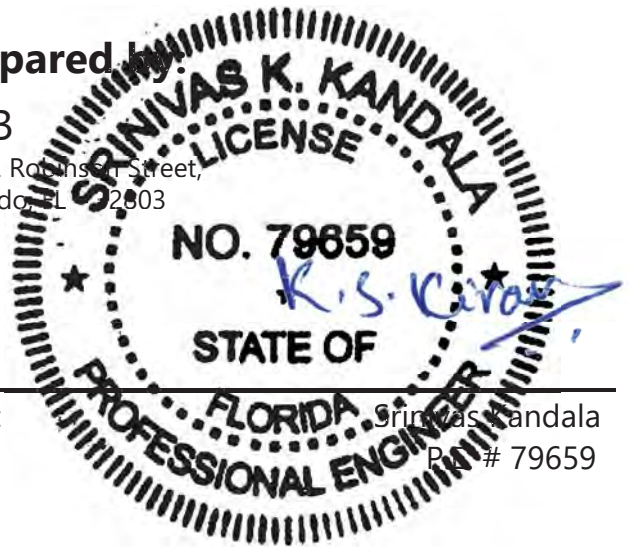
Clyde Morris Boulevard at Reed Canal Road, Clyde Morris Boulevard at Madeline Avenue & Clyde Morris Boulevard at Willow Run Boulevard

Prepared for:

River to Sea Transportation Planning Organization (R2CTPO)
2570 W. International Speedway Blvd., Suite 100
Daytona Beach, FL 32114-8145

Prepared by:

VHB
250 E. Robinson Street,
Orlando, FL 32803



Professional Engineer: Srinivas Kandala
P.E. # 79659

Feasibility Studies for Turn Lane Improvements

for

Clyde Morris Boulevard at Reed Canal Road,
Clyde Morris Boulevard at Madeline Avenue &
Clyde Morris Boulevard at Willow Run Boulevard

Task Work Order TOF-VHB-01

VOLUSIA COUNTY

Prepared for:

Prepared by:

Vanasse Hangen Brustlin, Inc.
Orlando, FL

April 2020

EXECUTIVE SUMMARY

This report presents the results of a feasibility analysis completed for the intersections of Clyde Morris Boulevard at Reed Canal Road, Clyde Morris Boulevard at Madeline Avenue & Clyde Morris Boulevard at Willow Run Boulevard, located in the City of Port Orange, Volusia County, Florida. This report was prompted by an application by City of Port Orange to evaluate the feasibility of construction of the following improvements along Clyde Morris Boulevard:

1. Northbound right turn lane at Clyde Morris Boulevard and Reed Canal Road intersection,
2. Northbound and Southbound right turn lanes at Clyde Morris Boulevard and Madeline Avenue intersection, and
3. Southbound right turn lane at Clyde Morris Boulevard and Willow Run Boulevard intersection.

Below are summaries of the improvements developed as part of this study:

Clyde Morris Boulevard at Reed Canal Road

- **Provide an exclusive northbound right turn lane.**
- Consider upgrading the existing lighting along Clyde Morris Boulevard to LED lighting and add four additional light poles to meet the intersection retrofit criteria**.**
- It is recommended to remove the two-way left turn lane pavement markings between the westbound left turn lane at Clyde Morris Boulevard and Reed Canal Road intersection and the eastbound left turn lane at Reed Canal Road and Red Sail Lane intersection. Extend the storage for the westbound left turn lane at Clyde Morris Boulevard and Reed Canal Road intersection (to provide approximately 200 feet of total storage) by clearly defining this lane and the eastbound left turn lane at Reed Canal Road and Red Sail Lane intersection.
- Consider addressing the current ADA concerns at the time when the northbound right turn lane is constructed.

This improvement is based on the input provided in the application for a feasibility study completed by the City of Port Orange. **This modification can be implemented at an approximate cost of $514,709 and yields a Benefit/Cost (B/C) ratio of 1.27, which indicates that the anticipated benefits outweigh the estimated costs for the proposed modifications.**

Clyde Morris Boulevard at Madeline Avenue:

- **Provide an exclusive northbound right turn lane and an exclusive southbound right turn lane.**
- Consider upgrading the existing lighting along Clyde Morris Boulevard to LED lighting and add three additional light poles to meet the intersection retrofit criteria**.**
- Consider extending the storage length for the eastbound left turn lane (approximately 100 feet) by removing the median between this lane and the westbound left turn lane at Madeline Avenue and McDonald's driveway.
- Consider addressing the current ADA concerns at the time when the right turn lanes are constructed on Clyde Morris Boulevard.

This improvement is based on the input provided in the application for a feasibility study completed by the City of Port Orange. **These modifications can be implemented at an approximate cost of $915,084 and yields a B/C ratio of 3.46, which indicates that the anticipated benefits outweigh the estimated costs for this recommended alternative.**

Clyde Morris Boulevard at Willow Run Boulevard

- **Provide an exclusive southbound right turn lane.**
- Consider upgrading the existing lighting along Clyde Morris Boulevard to LED lighting and add four additional light poles to meet the intersection retrofit criteria.
- Consider providing a marked crosswalk on the east leg of the study intersection to cross City Center Parkway.
- Consider providing a sidewalk on the south side of Willow Run Boulevard/City Center Parkway as a long-term improvement. This will provide connectivity for the pedestrians travelling between the residential units south of Willow Run Boulevard and Port Orange City Hall.

- Consider addressing the current ADA concerns at the time when the southbound right turn lane is constructed.

This improvement is based on the input provided in the application for a feasibility study completed by the City of Port Orange. **This modification can be implemented at an approximate cost of $325,445 and yields a B/C ratio of 6.31, which indicates that the anticipated benefits outweigh the estimated costs for the proposed modifications**.

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INTRODUCTION

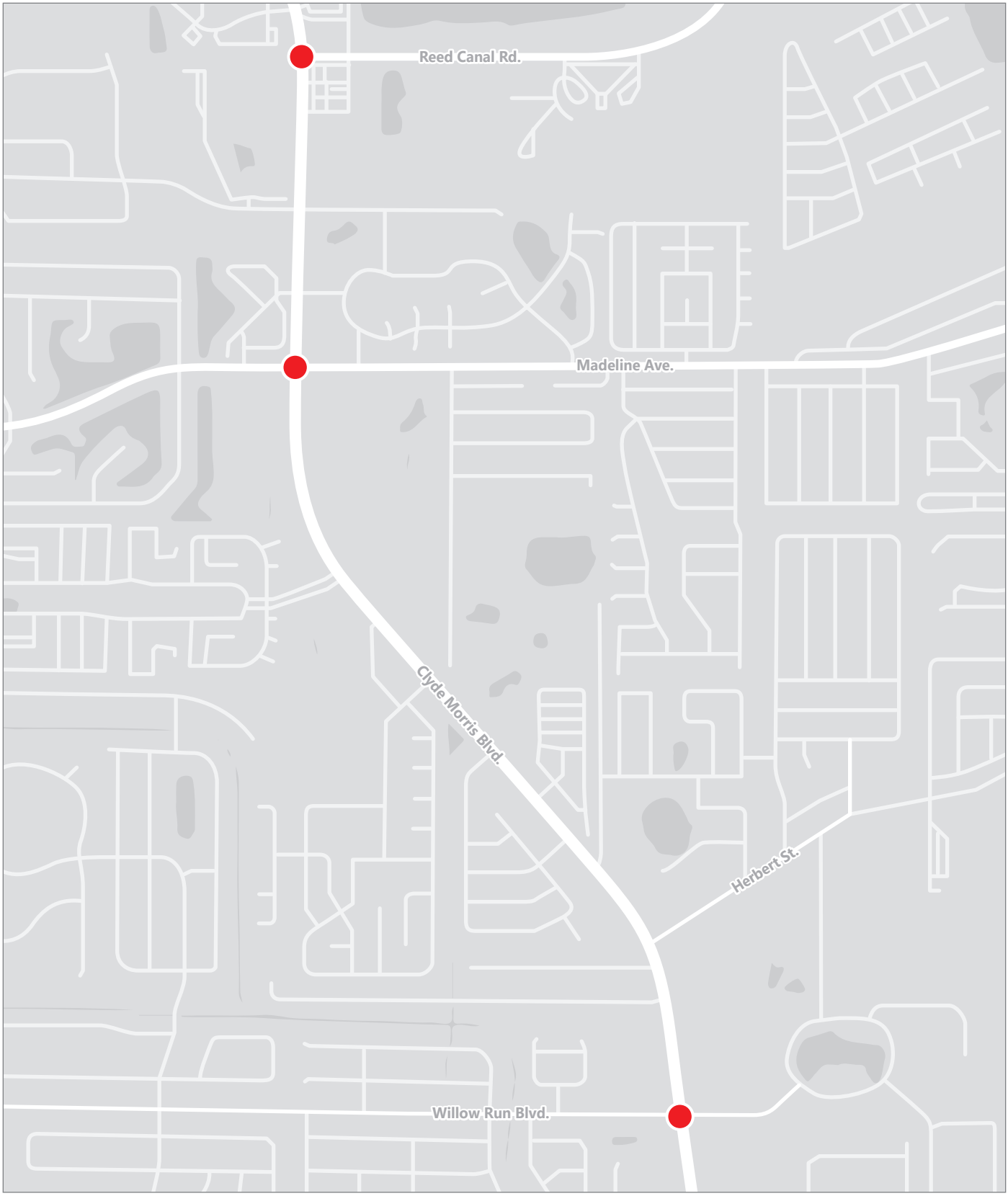
VHB, Inc. was retained to perform a feasibility analysis study for turn lane improvements at the Clyde Morris Boulevard at Reed Canal Road, Clyde Morris Boulevard at Madeline Avenue & Clyde Morris Boulevard at Willow Run Boulevard, located in the City of Port Orange, Volusia County, Florida, as illustrated in Figure 1. This study was initiated by separate applications by the City of Port Orange to evaluate the feasibility of construction of the following improvements along Clyde Morris Boulevard:

1. Northbound right turn lane at Clyde Morris Boulevard and Reed Canal Road intersection,
2. Northbound and Southbound right turn lanes at Clyde Morris Boulevard and Madeline Avenue intersection, and
3. Southbound right turn lane at Clyde Morris Boulevard and Willow Run Boulevard intersection.

The analysis methods used in completing this study are consistent with the Manual on Uniform Traffic Control Devices (MUTCD), the Manual on Uniform Traffic Studies (MUTS), the Traffic Engineering Manual (TEM) and engineering judgment. The remainder of this report documents existing conditions, vehicle and pedestrian counts, qualitative assessment, crash analysis, intersection analysis, B/C analysis and recommendations. The analysis will particularly consider the benefits and feasibility of adding dedicated right turn lanes at the study intersections as mentioned above.

This report is revised based on the comments received from Volusia County, the City of Port Orange and R2CTPO on the draft report. The responses to comments are provided in **Appendix A-1**.

Source: Google Maps



N

N.T.S.

Study intersections

vhb

Figure 1

Project Location Map
Feasibility Study for Turn Lane Improvements
Clyde Morris Blvd at Reed Canal Rd., Madeline Ave. & Willow Run Blvd.

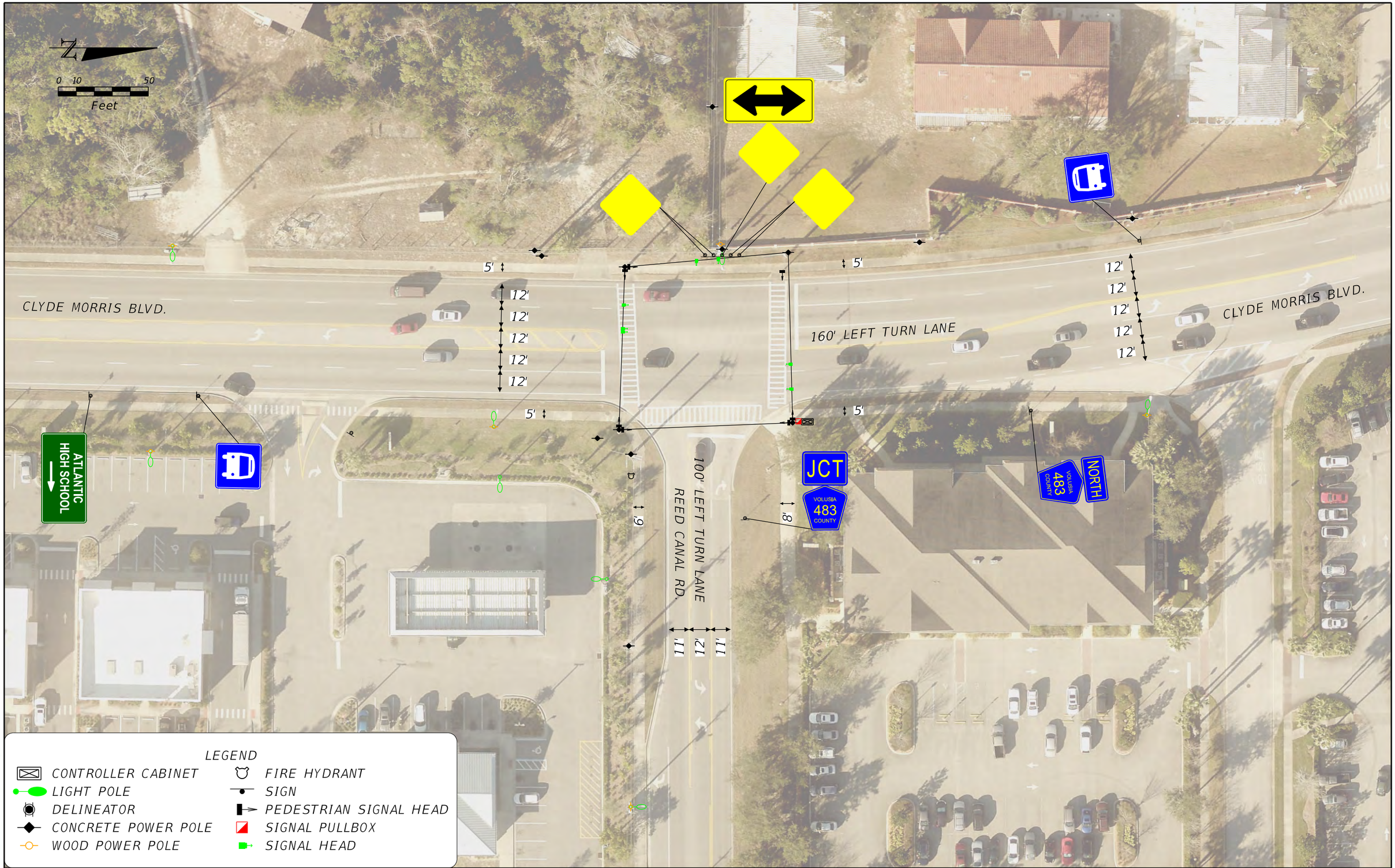
EXISTING CONDITIONS

Field Inventory

The intersections of Clyde Morris Boulevard at Reed Canal Road, Clyde Morris Boulevard at Madeline Avenue & Clyde Morris Boulevard at Willow Run Boulevard are located in the City of Port Orange, Volusia County, Florida. The characteristics of the study intersections are presented in **Table 1.** The **Figures 2** through **4**, depict the existing conditions including the general roadway geometry, pavement markings, land use, and intersection traffic control of the study corridor for all the three study intersections. The conditions stated in this report reflect conditions as observed on the date of the qualitative assessment.

Table 1: Field Inventory

Features	Clyde Morris Boulevard at Reed Canal Road	Clyde Morris Boulevard at Madeline Avenue	Clyde Morris Boulevard at Willow Run Boulevard
Main Street	Clyde Morris Boulevard (north-south); four-lane divided urban minor arterial	Clyde Morris Boulevard running north-south; four-lane divided urban minor arterial	Clyde Morris Boulevard running north-south; four-lane divided urban minor arterial
Minor Street	Reed Canal Road (east-west); two-lane undivided	Madeline Avenue (east-west); two-lane undivided	East Leg - City Center Parkway; two-lane undivided West Leg - Willow Run Boulevard; four-lane undivided (at the intersection)
Intersection Type	T-intersection	4-legged intersection	4-legged intersection
Number of Intersection Approach Lanes	Northbound – 1 through lane & 1 shared through/right lane Southbound – 1 left turn lane & 2 through lanes Westbound – 1 left turn lane & 1 right turn lane	Northbound – 1 left turn lane, 1 through lane & 1 shared through/right lane Southbound – 1 left turn lane, 1 through lane & 1 shared through/right lane Eastbound – 1 left turn lane, 1 through lane & 1 right turn lane Westbound - 1 left turn lane & 1 shared through/right turn lane	Northbound - 1 left turn lane, 1 through lane & 1 shared through/right lane Southbound - 1 left turn lane, 1 through lane & 1 shared through/right lane Eastbound - 1 left turn lane, 1 through lane & 1 right turn lane Westbound - 1 shared through/left turn lane & 1 right turn lane
Traffic Control	Signal	Signal	Signal
Speed Limit	Clyde Morris Boulevard - 45 mph Reed Canal Road - 35 mph	Clyde Morris Boulevard - 45 mph Madeline Avenue - 35 mph	Clyde Morris Boulevard - 45 mph Willow Run Boulevard - 35 mph
Sidewalks	Clyde Morris Boulevard - on both sides of the roadway Reed Canal Road - on both sides of the roadway	Clyde Morris Boulevard - on both sides of the roadway Madeline Avenue - on both sides of the roadway	Clyde Morris Boulevard - on both sides of the roadway Willow Run Boulevard - on north side of the roadway City Center Parkway - on north side of the roadway
Surrounding Development	Northwest: Residential Northeast: Conviva Care Centre Southwest: Vacant Land Southeast: Gas station Atlantic High School is located along Reed Canal Road, just east of Clyde Morris Boulevard.	Northwest: Residential Northeast: CVS Pharmacy Southwest: McDonalds Southeast: Gas station & Walmart	Northwest: Church & Vacant Land Northeast: Church & Clinics Southwest: Farrar Lisa DPM Southeast: Fire Station & Chiropractic Services
Nearest Signalized intersections	Clyde Morris Boulevard & Big Tree Road - 0.47 miles to the north Clyde Morris Boulevard & Madeline Avenue - 0.49 miles to the south Reed Canal Road & Nova Road - 1.0 mile to the east	Clyde Morris Boulevard & Reed Canal Road - 0.49 miles to the north Clyde Morris Boulevard & Herbert Street - 1.12 miles to the south Madeline Avenue & Nova Road - 1.27 miles to the east Madeline Avenue & Williamson Boulevard - 1.20 miles to the west	Clyde Morris Boulevard & Herbert Street - 0.28 miles to the north Clyde Morris Boulevard & Dunlawton Avenue - 0.6 miles to the south Willow Run Boulevard & Williamson Boulevard - 1.30 miles to the west
Roadway Lighting	Streetlight – along Clyde Morris Boulevard on the westside of the roadway	Streetlights - northwest and southwest quadrants of the intersection	Streetlights - northwest & northeast quadrants of the intersection



LEGEND

CONTROLLER CABINET	FIRE HYDRANT
LIGHT POLE	SIGN
DELINEATOR	PEDESTRIAN SIGNAL HEAD
CONCRETE POWER POLE	SIGNAL PULLBOX
WOOD POWER POLE	SIGNAL HEAD

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

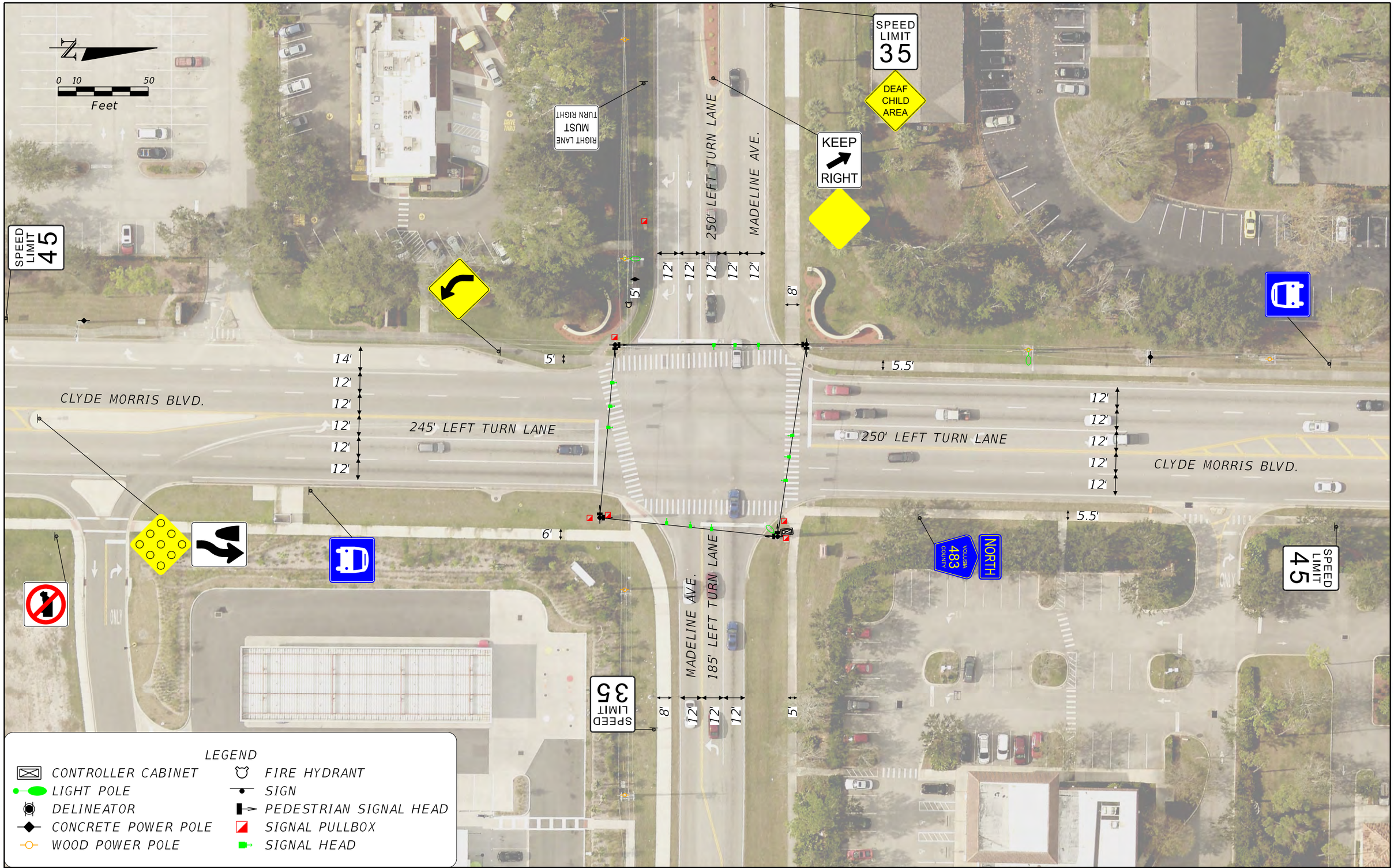
Vanasse Hangen Brustlin, Inc.
Transportation, Land Development, Environmental Services
225 E. Robinson St., Suite 300
Landmark Center Two
Orlando, FL 32801 (407)839-4006

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
483	VOLUSIA	

CONDITION DIAGRAM CLYDE MORRIS BLVD AT REED CANAL RD

FIGURE NO. 2



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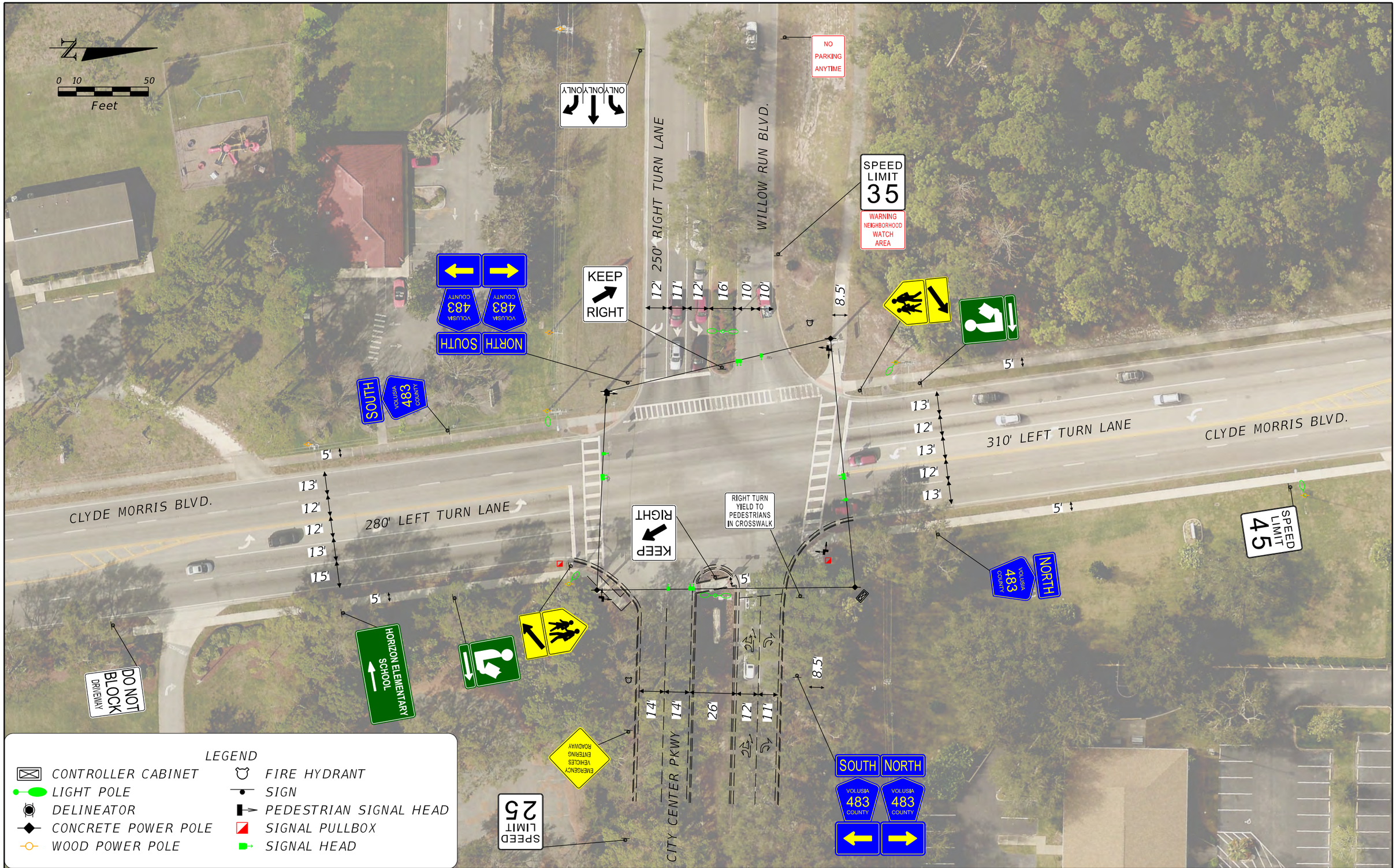
Landmark Center Two
Orlando, FL 32801 (407)839-4006

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
483	VOLUSIA	

CONDITION DIAGRAM CLYDE MORRIS BLVD AT MADELINE AVE

FIGURE NO. 3



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Vanasse Hangen Brustlin, Inc.
Transportation, Land Development, Environmental Services
225 E. Robinson St., Suite 300
Landmark Center Two
Orlando, FL 32801 (407)839-4006

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
483	VOLUSIA	

CONDITION DIAGRAM
CLYDE MORRIS BLVD AT WILLOW RUN BLVD

FIGURE NO. 4

Traffic Volume Data

24-hour volume traffic counts were collected along Clyde Morris Boulevard, south of Madeline Avenue, on 01/14/2020, representing typical commuter weekdays. The 24-hour volume traffic counts were supplemented with 8-hour intersection turning movement counts. The turning movement counts were collected between 7:00 AM – 9:00 AM and 12:00 PM – 6:00 PM at the study intersections (Clyde Morris Boulevard at Reed Canal Road, Clyde Morris Boulevard at Madeline Avenue & Clyde Morris Boulevard at Willow Run Boulevard). These hours represent the highest eight hours obtained from the volume counts. From this data, the AM, mid-day and PM peak traffic hours were found to occur from 7:30 AM to 8:30 AM, 12:00 PM to 1:00 PM and 4:30 PM to 5:30 PM, respectively, for all study intersections. The overall peak hour for the intersections was found to occur during the PM peak hour. The turning movement counts revealed that the traffic in northbound direction peaks during AM conditions and the traffic in southbound direction peaks during PM conditions. During mid-day conditions, the traffic is equally distributed in both directions. The 24-hour volume counts, 8-hour turning movement counts and pedestrian/bicycle counts are provided in greater detail in **Appendix A-2**. The following table summarizes the distribution of turning movements at the study intersections.

Table 2: 8 Hour Turning Movement Percentages (All Vehicles)

Study Intersection	Movement	Northbound	Southbound	Eastbound	Westbound
Clyde Morris Boulevard & Reed Canal Road	Left turn/U-turn	0.03%	13.09%	0.00%	65.81%
	Through	83.90%	86.91%	0.00%	0.00%
	Right-turn	16.07%	0.00%	0.00%	34.19%
Clyde Morris Boulevard & Madeline Avenue	Left turn/U-turn	13.97%	12.77%	39.52%	36.74%
	Through	77.57%	70.19%	37.69%	44.50%
	Right-turn	8.46%	17.05%	22.79%	18.76%
Clyde Morris Boulevard & Willow Run Boulevard	Left turn/U-turn	12.14%	9.06%	47.82%	19.32%
	Through	81.77%	70.83%	25.28%	37.63%
	Right-turn	6.09%	20.11%	26.90%	43.06%

Crash Data

The latest available three years of crash data (from January 1, 2017 to December 31, 2019) along Clyde Morris Boulevard at Reed Canal Road, Clyde Morris Boulevard at Madeline Avenue and Clyde Morris Boulevard at Willow Run Boulevard intersections were obtained from Signal Four Analytics. Raw crash data is included in **Appendix B**.

Clyde Morris Boulevard at Reed Canal Road - Crash Summary

As shown in **Table 3,** there were 32 crashes reported within the influence area of this intersection. The crashes consisted of 18 rear end, 1 head on, 2 sideswipe, 5 left turn, 1 off road, 2 pedestrian/bicyclist, and 3 other crashes. The crashes caused 16 injuries (from 14 crashes), and total property damage amounted to approximately $205,850. There were no fatalities. 25 of the crashes occurred in daylight and the remaining 7 crashes occurred in dark or dusk conditions. Pavement condition was dry for 23 of the crashes and wet conditions for the remaining 9 crashes.

Clyde Morris Boulevard at Madeline Avenue - Crash Summary

As shown in **Table 4**, there were 62 crashes reported within the influence area of this intersection. The crashes consisted of 33 rear end, 6 sideswipes, 3 angle, 10 left turn, 1 right turn, 1 off road, 1 pedestrian/bicyclist, and 7 other crashes. The crashes caused 44 injuries (from 26 crashes), and total property damage amounted to approximately $354,480. There were no fatalities. 46 of the crashes occurred in daylight and 16 crashes occurred in dark or dusk conditions. Pavement condition was dry for 59 of the crashes and wet conditions for the remaining 3 crashes.

Clyde Morris Boulevard at Willow Run Boulevard - Crash Summary

As shown in **Table 5**, there were 36 crashes reported within the influence area of the intersection. The crashes consisted of 18 rear end, 1 sideswipe, 2 angle, 3 left turn, 3 off road, 2 pedestrian/bicyclist, and 7 other crashes. The crashes caused 17 injuries (from 11 crashes), and total property damage amounted to approximately $199,500. There were no fatalities. 29 of the crashes occurred in daylight and 7 crashes occurred in dark or dusk conditions. Pavement condition was dry for 33 of the crashes and wet conditions for the remaining 3 crashes.

Table 3: Clyde Morris Boulevard at Reed Canal Road – Crash Summary

Crash Type	2017	2018	2019	Total	Proportion
Rear End	6	7	5	**18**	56%
Head On	0	0	1	**1**	3%
Sideswipe	0	1	1	**2**	6%
Roll Over	0	0	0	**0**	0%
Angle	0	0	0	**0**	0%
Left Turn	1	4	0	**5**	16%
Right Turn	0	0	0	**0**	0%
Off Road	0	1	0	**1**	3%
Pedestrian & Bicycle	1	0	1	**2**	6%
Animal	0	0	0	**0**	0%
Other	0	3	0	**3**	9%
Total	**8**	**16**	**8**	**32**	100%
Crash Severity	**2017**	**2018**	**2019**	**Total**	**Proportion**
Fatality	0	0	0	**0**	0%
Injury	2	9	3	**14**	44%
Property Damage Only	6	7	5	**18**	56%
Total	**8**	**16**	**8**	**32**	100%
Pavement Condition	**2017**	**2018**	**2019**	**Total**	**Proportion**
Wet	1	5	3	**9**	28%
Dry	7	11	5	**23**	72%
Slippery	0	0	0	**0**	0%
Total	**8**	**16**	**8**	**32**	100%
Light Condition	**2017**	**2018**	**2019**	**Total**	**Proportion**
Daylight	8	10	7	**25**	78%
Dusk	0	1	0	**1**	3%
Dawn	0	1	0	**1**	3%
Dark	0	4	1	**5**	16%
Total	**8**	**16**	**8**	**32**	100%

Table 4: Clyde Morris Boulevard at Madeline Avenue – Crash Summary

Crash Type	2017	2018	2019	Total	Proportion
Rear End	10	8	15	**33**	53%
Head On	0	0	0	**0**	0%
Sideswipe	2	1	3	**6**	10%
Roll Over	0	0	0	**0**	0%
Angle	1	1	1	**3**	5%
Left Turn	5	2	3	**10**	16%
Right Turn	1	0	0	**1**	2%
Off Road	1	0	0	**1**	2%
Pedestrian & Bicycle	0	0	0	**0**	0%
Animal	0	0	0	**0**	0%
Other	1	5	2	**8**	13%
Total	**21**	**17**	**24**	**62**	100%
Crash Severity	**2017**	**2018**	**2019**	**Total**	**Proportion**
Fatality	0	0	0	**0**	0%
Injury	9	4	13	**26**	42%
Property Damage Only	12	13	11	**36**	58%
Total	**21**	**17**	**24**	**62**	100%
Pavement Condition	**2017**	**2018**	**2019**	**Total**	**Proportion**
Wet	3	0	0	**3**	5%
Dry	18	17	24	**59**	95%
Slippery	0	0	0	**0**	0%
Total	**21**	**17**	**24**	**62**	100%
Light Condition	**2017**	**2018**	**2019**	**Total**	**Proportion**
Daylight	17	12	17	**46**	74%
Dusk	2	0	0	**2**	3%
Dawn	1	0	1	**2**	3%
Dark	1	5	6	**12**	19%
Total	**21**	**17**	**24**	**62**	100%

Table 5: Clyde Morris Boulevard at Willow Run Boulevard – Crash Summary

Crash Type	2017	2018	2019	Total	Proportion
Rear End	2	7	9	**18**	50%
Head On	0	0	0	**0**	0%
Sideswipe	1	0	0	**1**	3%
Roll Over	0	0	0	**0**	0%
Angle	1	1	0	**2**	6%
Left Turn	3	0	0	**3**	8%
Right Turn	0	0	0	**0**	0%
Off Road	2	0	1	**3**	8%
Pedestrian & Bicycle	0	1	1	**2**	6%
Animal	0	0	0	**0**	0%
Other	4	2	1	**7**	19%
Total	**13**	**11**	**12**	**36**	100%
Crash Severity	**2017**	**2018**	**2019**	**Total**	**Proportion**
Fatality	0	0	0	**0**	0%
Injury	3	4	4	**11**	31%
Property Damage Only	10	7	8	**25**	69%
Total	**13**	**11**	**12**	**36**	100%
Pavement Condition	**2017**	**2018**	**2019**	**Total**	**Proportion**
Wet	2	0	1	**3**	8%
Dry	11	11	11	**33**	92%
Slippery	0	0	0	**0**	0%
Total	**13**	**11**	**12**	**36**	100%
Light Condition	**2017**	**2018**	**2019**	**Total**	**Proportion**
Daylight	9	9	11	**29**	81%
Dusk	0	0	0	**0**	0%
Dawn	0	0	0	**0**	0%
Dark	4	2	1	**7**	19%
Total	**13**	**11**	**12**	**36**	100%

QUALITATIVE ASSESSMENT

A qualitative assessment (QA) was conducted at each study intersection in the field to evaluate the existing operating conditions occurring on a typical weekday, and to identify areas where improvements would be potentially beneficial to the overall safety and efficiency of the location. A registered professional engineer performed the QA during the AM and PM peak hour periods. The field observations are summarized in Tables 6 through 8 for the 3 study intersections.

Table 6: Qualitative Assessment: Clyde Morris Boulevard at Reed Canal Road

Feature	Observation
Observation Timings	7:00 to 9:00 AM, 3:00 to 4:00 PM (High School open/close times) & 4:30 to 5:30 PM
Traffic	1. The flow of traffic on Clyde Morris Boulevard was heavier in the northbound direction during AM peak hour and was heavier in the southbound direction during PM peak hour. 2. During the observed peak hours, the intersection operated without residual queues or cycle failures. Queues on each approach cleared up within the allotted green phase of the signal operation. 3. A heavy northbound right turn movement was observed between 8:00 and 8:15 AM (usual drop-off period for Atlantic High School). The slowing northbound right turning vehicles were observed to slow down the northbound through vehicles as well. In one instance, a queue of around 25 vehicles was observed in the northbound outside through lane during AM peak hour but cleared up within one cycle. It was also observed that the northbound outside through lane traffic is impacted by the right in/right out access (150 ft south of study intersection) to the 7-Eleven gas station located in the southeast corner of the study intersection. 4. In one instance during AM peak hour (school opening hour), westbound approach queues on Reed Canal Road were observed to back up approximately 200 feet but cleared in one cycle. During PM peak hour (school closing hour), westbound approach queues on Reed Canal Road were observed to back up approximately 400 feet. 5. During AM peak hour, the southbound left queue was observed to back up approximately 150 Feet, blocking the southbound through movement but cleared in one cycle. 6. During the PM peak hour (school closing hour - 3:00 to 4:00 PM), it was observed that students attending Atlantic High School would walk down to the 7-Eleven gas station to meet their parents as a secondary pick up location. A few vehicles were observed to use the right in/right out access to the 7-Eleven gas station to avoid the northbound right turn at Clyde Morris & Reed Canal Road intersection.
Pedestrian/Bicycle	1. Eight pedestrians during the school opening period and 9 pedestrians during the school close period were observed at the study intersection. 2. Sidewalks are present on both sides of Clyde Morris Boulevard and Reed Canal Road. 3. Crosswalks are present on all legs of the study intersection. The crosswalks are marked with special emphasis pavement markings, which are appropriate for a crossing at a signalized intersection. 4. The walk times provided appeared adequate for pedestrians to cross at a normal pace and within the allotted time. 5. Bike lanes are not present at the study intersection.
Pavement & Signage	Pavement markings and signage along Clyde Morris Boulevard and along Reed Canal Road are in fair to good condition.
Roadway Lighting	1. The existing lighting along Clyde Morris Boulevard at Reed Canal Road is on existing Florida Power & Light Company (FPL) power poles or on standalone wood poles. 2. The existing luminaires are 200W High Pressure Sodium (HPS) mounted at 30-feet. 3. The Florida Design Manual (FDM) retrofit-lighting criteria is not being met with the existing lighting. 4. Along Reed Canal Road, there are luminaires on FPL power poles mounted at 30-feet.
Americans with Disabilities Act (ADA) concerns	1. Truncated domes are not provided at the study intersection. 2. All curb ramps must be reevaluated and realigned if needed, since some of the ramps are not aligned with the crosswalks. 3. The curb ramps (on the west side of the study intersection) have running slopes that exceed ADA requirements. 4. The push button in the southeast corner of the study intersection is far away from the landing pad and does not meet ADA requirements.

Table 7: Qualitative Assessment: Clyde Morris Boulevard at Madeline Avenue

Feature	Observation
Observation Timings	7:00 to 9:00 AM and 4:00 to 6:00 PM
Traffic	1. The flow of traffic on Clyde Morris Boulevard was heavier in the northbound direction during the AM peak hour and was heavier in the southbound direction during the PM peak hour 2. During the observed peak hours, the intersection operated without residual queues or cycle failures. Queues on each approach cleared up within the allotted green phase of the signal operation. 3. A higher number of vehicles were observed in the northbound outside through lane (compared to inside through lane) so that they can turn right at Reed Canal Road (Atlantic High School traffic). It was also observed that traffic in the northbound outside through lane is impacted by the right in/right out access (located 250 feet south of study intersection) to the gas station & Walmart. 4. During both the AM and PM peak hours, westbound queues on Madeline Ave were observed to back up approximately 300 feet but cleared in one cycle. 5. A heavy eastbound left turn movement was observed during the AM peak hour. In few instances, this movement blocked eastbound through movement but cleared up in one cycle. 6. During the PM peak hour, it was observed that eastbound through movement sometimes blocked the eastbound left turning vehicles. The eastbound through queue backed up till Long Grove Lane during the PM peak hour. 7. A heavy southbound right turn movement was observed during the PM peak hour. It was observed that vehicles making southbound right turn movement were slowing down and impacting the through movement.
Pedestrian/Bicycle	1. Very less pedestrian traffic activity was observed at the study intersection. 2. Sidewalks are present on both sides of Clyde Morris Boulevard and Madeline Avenue. 3. Crosswalks are present on all legs of the study intersection. The crosswalks are marked with special emphasis pavement markings, which are appropriate for a crossing at a signalized intersection. 4. The walk times provided appeared adequate for pedestrians to cross at a normal pace and within the allotted time. 5. Bike lanes are not present at the study intersection.
Pavement & Signage	Pavement markings and signage along Clyde Morris Boulevard and along Madeline Ave are in fair to good condition.
Roadway Lighting	1. The existing lighting along Clyde Morris Boulevard at Madeline Avenue is on existing FPL power poles on the west side of the road. 2. The existing luminaires are 200W HPS mounted at 30-feet. 3. The FDM retrofit-lighting criteria is not being met with the existing lighting. 4. There are pedestrian low-level LED lights along the sidewalk on Clyde Morris Boulevard on the southeast quadrant of the intersection, along the Walmart property.
Americans with Disabilities Act (ADA) concerns	1. Truncated domes are provided only in the southeast corner street-to-sidewalk transition at the study intersection. 2. All curb ramps must be reevaluated and realigned if needed, since some of the ramps are not aligned with the crosswalks. 3. The push button in the northwest corner of the study intersection is far away from the landing pad and does not meet ADA requirements. 4. A second set of pedestrian push buttons are provided closer to the sidewalk to meet the ADA requirements, since the push buttons that are mounted on the signal pole are in the grass buffer.

Table 8: Qualitative Assessment: Clyde Morris Boulevard at Willow Run Boulevard

Feature	Observation
Observation Timings	7:00 to 9:00 AM and 4:00 to 6:00 PM
Traffic	1. The flow of traffic on Clyde Morris Boulevard was heavier in the northbound direction during AM peak hour and was heavier in the southbound direction during PM peak hour. 2. During the observed peak hours, the intersection operated without residual queues or cycle failures. Queues on each approach cleared up within the allotted green phase of the signal operation. 3. Split phasing is used for the side street movements (eastbound and westbound movements). 3. A heavy eastbound left turn movement was observed during the AM peak hour with around 500 feet queue in some instances. The eastbound left turn lane is a full lane and the queue generally cleared up in one cycle. 4. A heavy southbound right turn movement was observed during the PM peak hour. It was observed that vehicles making southbound right turn movement were slowing down and impacting the through movement. 5. A "No Turn on Red" warning sign was active for the southbound right turn movement during the westbound green phase.
Pedestrian/Bicycle	1. Very less pedestrian traffic activity was observed at the study intersection. 2. Sidewalks are present on both sides of Clyde Morris Boulevard and along the northside of Willow Run Boulevard/City Center Parkway. 3. Special emphasis crosswalk markings are present on the north, south and west legs of the study intersection. Pedestrians can cross City Center Parkway (pedestrian push buttons are provided) but this crossing is not marked. 4. The walk times provided appeared adequate for pedestrians to cross at a normal pace and within the allotted time. 5. Bike lanes are not present at the study intersection.
Pavement & Signage	Pavement markings and signage along Clyde Morris Boulevard and along Willow Run Boulevard are in fair to poor condition.
Roadway Lighting	1. The existing lighting along Clyde Morris Boulevard at Willow Run Boulevard is on existing FPL power poles or on standalone wood poles. 2. The existing luminaires are 200W HPS mounted at 30-feet. Along Willow Run Boulevard, there are dual LED luminaires on light poles mounted at 25-feet in the median on the west leg of the intersection. 3. On the east leg, Center City Parkway, there are dual shoe box luminaires in the median mounted at 25-feet. 4. Based on the existing location of the luminaires, FDM retrofit-lighting criteria is not being met with the existing lighting.
Americans with Disabilities Act (ADA) concerns	1. Truncated domes are provided at all street-to-sidewalk transitions at the study intersection. 2. All curb ramps must be reevaluated and realigned if needed, since some of the ramps are not aligned with the crosswalks.

FEASIBILITY ANALYSIS

Background

The City of Port Orange submitted separate applications to perform a feasibility study to construct the following improvements along Clyde Morris Boulevard:

1. Northbound right turn lane at Clyde Morris Boulevard and Reed Canal Road intersection,
2. Northbound and southbound right turn lanes at Clyde Morris Boulevard and Madeline Avenue intersection, and
3. Southbound right turn lane at Clyde Morris Boulevard and Willow Run Boulevard intersection

The purpose of the right turn lane improvements is to enable traffic to move out of the way of through traffic and decelerate in a separate turn lane, thus reducing delay for both through as well as right turning vehicles. Adding exclusive right turn lanes will also reduce the likelihood of rear end crashes associated with traffic slowing down to make the turn from Clyde Morris Boulevard onto the side streets.

Methodology

The methodology for determining the feasibility of implementing the proposed improvements includes performing a comparison of before and after operating conditions at each study intersection utilizing traffic operation analysis software and preparing a B/C analysis for any proposed improvements.

Operational Analysis

The operational analysis was performed for the proposed alternative at each study intersection for before and after conditions. The before conditions assume that there is no change in intersection geometry and signal timings, whereas, the after conditions assume improvements under the proposed alternative. The existing and improved operating conditions were determined using Synchro 10/SimTraffic simulation software.

The signal timing information was provided by Volusia County. Table 9 summarizes the intersection delay and levels of service (LOS) at each study intersection for before and after conditions during the three peak periods. The SimTraffic simulation results were provided in **Appendix C**.

Table 9: Before and After Operational Analysis Results

Intersection	Approach	AM Peak Hour				Mid-Day				PM Peak Hour			
		Before		After		Before		After		Before		After	
		Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS	Delay (Sec.)	LOS
Clyde Morris Boulevard & Reed Canal Road	Eastbound	-	-	-	-	-	-	-	-	-	-	-	-
	Westbound	22.4	C	22.9	C	19.8	B	19.9	B	27.7	C	28.2	C
	Northbound	17.5	B	16.0	B	12.4	B	12.0	B	15.1	B	14.1	B
	Southbound	9.9	A	10.2	B	8.0	A	8.3	A	10.7	B	10.0	A
	Overall	**15.7**	**B**	**15.1**	**B**	**11.6**	**B**	**11.6**	**B**	**14.7**	**B**	**14.1**	**B**
Clyde Morris Boulevard & Madeline Avenue	Eastbound	32.1	C	31.4	C	29.6	C	30.6	C	37.9	D	37.1	D
	Westbound	55.6	E	50.4	D	33.1	C	33.5	C	49.2	D	51.9	D
	Northbound	29.7	C	29.7	C	26.3	C	24.6	C	31.7	C	30.4	C
	Southbound	29.7	C	28.5	C	23.2	C	21.0	C	39.4	D	30.6	C
	Overall	**33.9**	**C**	**32.6**	**C**	**26.7**	**C**	**25.5**	**C**	**38.1**	**D**	**34.5**	**C**
Clyde Morris Boulevard & Willow Run Boulevard	Eastbound	42.4	D	35.7	D	32.4	C	31.7	C	39.0	D	38.5	D
	Westbound	26.1	C	25.6	C	25.6	C	25.2	C	36.4	D	37.5	D
	Northbound	26.2	C	24.6	C	23.4	C	23.4	C	30.5	C	30.3	C
	Southbound	24.8	C	20.4	C	25.9	C	23.3	C	42.0	D	31.0	C
	Overall	**29.9**	**C**	**26.1**	**C**	**26.0**	**C**	**24.8**	**C**	**37.6**	**D**	**32.7**	**C**

Note: The results are based on average of 10 random seed SimTraffic Simulation runs

Site Assessments for Proposed Improvements

This section provides a brief assessment of the sites that can be considered before constructing the proposed improvements.

Northbound right turn lane at Clyde Morris Boulevard and Reed Canal Road intersection

In order to construct an exclusive northbound right turn lane, the following elements will need to be accounted for.

- To provide a 14-foot border width per FDM 210.7.1, an eight-foot wide swath of private property will need to be acquired for right-of-way use. The agreement will need to include harmonizing treatments with the remaining parcel.
- Two business signs will need to be relocated.
- Existing entrance into property will need to be reconstructed.
- Existing inlet needs to be modified to a manhole and a new inlet constructed at the proposed curb line.
- Bus stop will need to be relocated.
- One luminaire will need to be relocated or reconstructed.
- New Signal pole on the SE corner and reconnect to existing signal poles.
- Reconstruct Westerly and NE ramps and update pedestrian features.
- Underground utilities cannot be determined, but above ground evidence is as follows:
    - Telephone duct bank and vault.
    - Gas line and valves.
    - Cable TV and riser.
    - Waterline, backflows, hydrants and valves.
    - Miscellaneous irrigation

Northbound right turn lane at Clyde Morris Boulevard and Madeline Avenue intersection

In order to construct an exclusive northbound right turn lane, the following elements will need to be accounted for.

- Existing entrance into property will need to be reconstructed.
- Existing inlet will need to be modified to a manhole and a new inlet will need to be constructed at the proposed curb line.
- Provide a new signal pole in the SE corner and reconnect it to the existing signal poles.
- Reconstruct NE ramp and update pedestrian features.
- Relocate bus stop and shelter.
- Underground utilities cannot be determined, but above ground evidence are as follows:
    - Telephone duct bank and vault.
    - Gas line and valves

Southbound right turn lane at Clyde Morris Boulevard and Madeline Avenue intersection

In order to construct an exclusive southbound right turn lane, the following elements will need to be accounted for.

- To provide a 14-foot border width per FDM 210.7.1, an eight-foot wide swath of private property will need to be acquired for right-of-way use. The agreement or TCE will need to include harmonizing treatments with the remaining parcel and existing Markey wall.
- Existing inlets will need to be modified to manholes and new inlets will need to be constructed at the proposed curb line.
- Relocate bus stop.
- Provide a new signal pole in the NW corner and reconnect it to the existing signal poles.
- Underground utilities cannot be determined, but above ground evidence are as follows:
    - Power.
    - Cable TV and riser.

Southbound right turn lane at Clyde Morris Boulevard and Willow Run Boulevard intersection

In order to construct an exclusive southbound right turn lane, the following elements will need to be accounted for.

- To provide a 14-foot border width per FDM 210.7.1, an eight-foot wide swath of private property will need to be acquired for right-of-way use. The agreement will need to include harmonizing treatments with the remaining parcel.
- Existing entrance into property will need to be reconstructed.
- Existing inlets will need to be modified to manholes and new inlets will need to be constructed at the proposed curb line.
- Provide a new signal pole in the NW corner and reconnect it to the existing signal poles.
- Reconstruct Easterly ramps and update ped features.
- Underground utilities cannot be determined, but above ground evidence are as follows:
    - Cable TV and riser.
    - Waterline and hydrant and valves.
    - Power.

B/C Analysis

A B/C analysis was performed for the study intersections based on traffic operational benefits as well as crash reduction benefits.

Traffic Operational Benefits

To estimate the operational benefits of the proposed intersection improvements, SimTraffic simulation was used. The benefits are defined in terms of annualized cost savings associated with reductions in the following three measures of effectiveness (MOEs):

- Total Delay (Vehicle-Hours)
- Stops
- Fuel Consumption (Gallons)

The benefits were calculated for 300 days in a year for nine (9) hours per day (3 hours each for AM, Mid-day and PM peak periods) accounting for reduced benefits anticipated due to lower traffic volumes during the weekend. The value of delay time per hour ($18.12) and fuel cost ($2.28) were obtained from "The Mobility Data for Orlando" published by Texas A&M University.

Stops were estimated to cost $0.014 each. Table 10 summarizes the unit value of each MOE in a tabular format along with its source.

Table 10: Unit Value of MOEs

MOE Values	Unit Value	Source
Stops ($)	0.014	Transyt 7F
Delay ($)	18.12	2019 Urban Mobility Report published by Texas A&M Transportation Institute (TTI)
Fuel ($/gal.)	2.28	2019 Urban Mobility Report published by TTI
Days per Year	300	Average days with observable AM & PM peaking characteristics

Crash Reduction Benefits

For the purpose of this study, the Historical Crash Method (HCM) was used to calculate the B/C ratio for the proposed improvements. This method can be used for sites with a crash history. The HCM is the ratio (benefit/cost) of the estimated annual reduction in crash costs to the estimated annual construction costs. The annualized conversion will show whether the projected expenditure of funds for the crash benefit will exceed the direct cost for the improvement.

The HCM uses the Highway Safety Improvement Program Guideline (HSIPG) cost per crash by facility type as shown in Table 122.6.1 of the FDOT's FDM to estimate the benefit to society, while the cost to society is estimated by the expected cost of construction. Based on the information provided in the FDM, the average cost per crash (for Florida between 2012 and 2016) for a 4-5 lane urban divided roadway facility was used. The benefits were calculated for the following:

- Provide a right turn lane on one major road approach
- Provide a right turn lane on both major road approaches

The crash reduction benefits were estimated based on the expected reduction of rear end crashes along Clyde Morris Boulevard because of addition of right turn lane(s). The first step in calculating the benefit for a reduction in crashes is to identify a Crash Reduction Factor (CRF) for each of the proposed safety improvements. The two most common sources for CRF's are Federal Highway Administration's (FHWA) CMF Clearinghouse and Desktop Reference for Crash Reduction Factors.

It is important to note that the CRF's are based on historical data for similar roadway geometries and traffic characteristics. The CMF's (for locations reasonably similar to the study corridor) used in this study are provided in **Appendix D.**

Improvement Construction Costs

The estimated costs for the proposed turn lane improvements at the three study intersections were initially prepared by the Consultant. The City of Port Orange supplemented these initial cost estimates with additional items and provided final cost estimates that were used in the B/C analysis. The final cost estimates are provided in **Appendix D**.

The estimated cost for the Clyde Morris Boulevard at Reed Canal Road intersection modifications is $514,709 (present day value) and it has a corresponding annualized cost amounting to $37,873. Additional right-of-way (ROW) is anticipated for the northbound right turn lane improvement at this intersection.

The estimated cost for the Clyde Morris Boulevard at Madeline Avenue intersection improvements is $915,084 (present day value) and it has a corresponding annualized cost amounting to $67,333. Additional ROW is anticipated for the southbound right turn lane improvement at this intersection.

The estimated cost for the Clyde Morris Boulevard at Willow Run Boulevard intersection improvements is $325,445 (present day value) and it has a corresponding annualized cost amounting to $23,946. Additional ROW is anticipated for the southbound right turn lane improvement at this intersection. Please note that the ROW cost is not included in the above cost estimate.

Please note that the lighting improvement cost was not included in the B/C analysis. The service life for the modification is assumed 20 years and the interest rate used in the calculation of annualized costs is assumed 4%, which is a value frequently used by the Florida Department of Transportation (FDOT) in their benefit cost computations.

Table 11 summarizes the B/C analysis for the study intersections. The analysis yields B/C ratios of 1.27, 3.46, and 6.31 for the study intersections of Clyde Morris Boulevard at Reed Canal Road, Clyde Morris Boulevard at Madeline Avenue, and Clyde Morris Boulevard at Willow Run Boulevard, respectively.

The calculated B/C ratio at each study intersection indicates that the anticipated benefits outweigh the estimated costs for the proposed modification, with benefits derived through reduced costs associated with lower delay, stops, fuel consumption and crashes. The operational annual user benefits calculations can be found in **Appendix D**.

Table 11: B/C Analysis Results

Study Intersection	Annual User Benefit			Annual Construction Cost	B/C Ratio
	Operational Annual User Benefit	Crash Reduction Annual User Benefit	Total		
Clyde Morris Boulevard & Reed Canal Road	$19,490	$28,840	$48,330	$37,873	1.27
Clyde Morris Boulevard & Madeline Avenue	$83,502	$149,966	$233,468	$67,333	3.46
Clyde Morris Boulevard & Willow Run Boulevard	$110,795	$40,375	$151,170	$23,946	6.31

Notes:

1) The service life of the improvements was kept at 20 years.
2) Interest rate of 4% was used to determine the annual cost of improvements.
3) Traffic operational annual user benefit was calculated for 300 days in a year for nine (9) hours per day (3 hours each for AM, Mid-day and PM peak periods).
4) Construction cost does not include right-of-way cost.
5) Lighting improvement cost is not considered in the B/C analysis.
6) Cost per crash is based on FDM Table 122.6.1 for a 4-5 lane urban divided roadway.

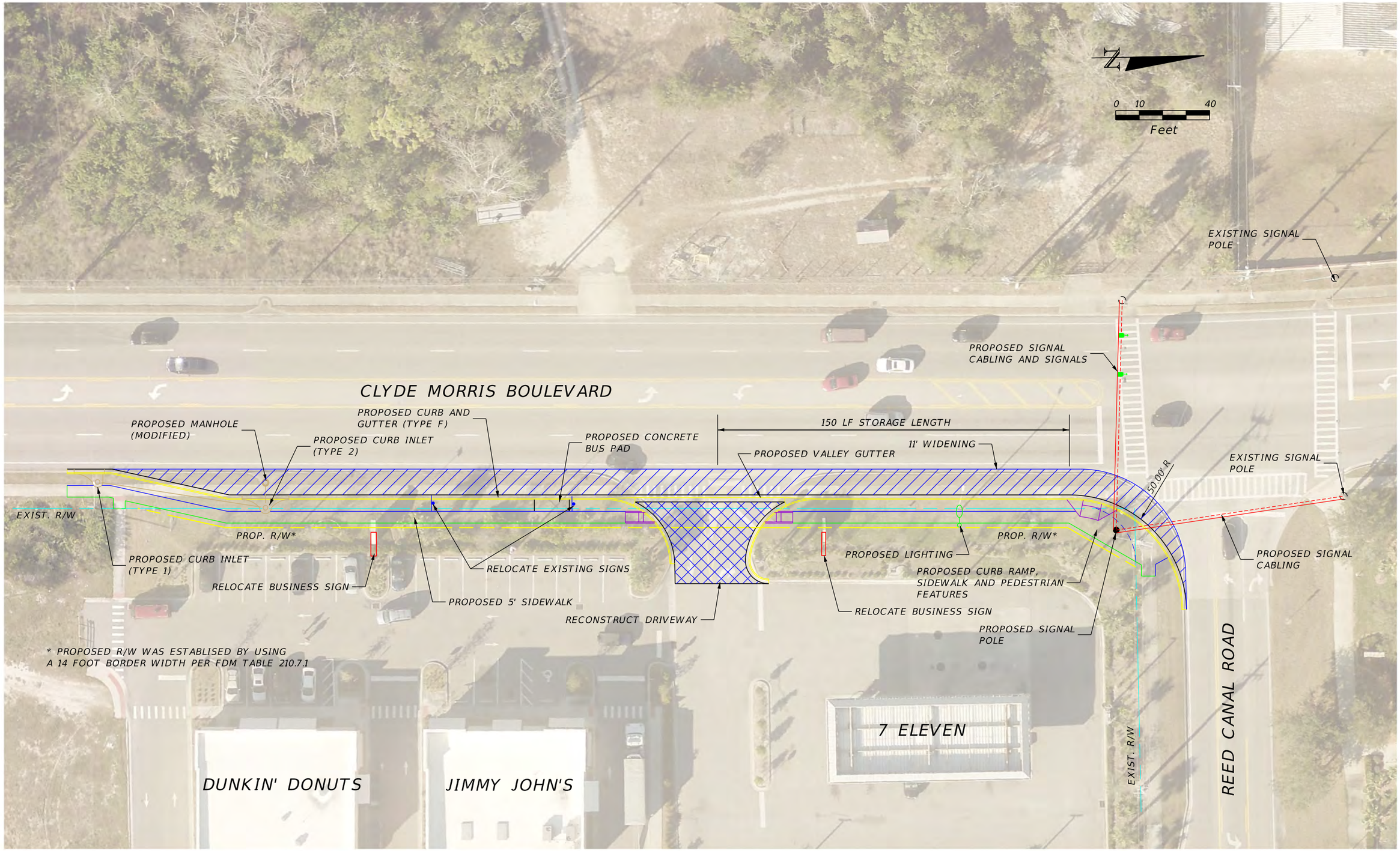

FIGURE 5

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

VANASSE HANGEN BRUSTLIN, INC.
225. E. ROBINSON STREET
ORLANDO, FL 32801
CERTIFICATE OF AUTHORIZATION 3932

CITY OF PORT ORANGE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 483	VOLUSIA	

IMPROVEMENT DIAGRAM OF
CLYDE MORRIS BLVD. & REED CANAL RD.

SHEET NO. 1

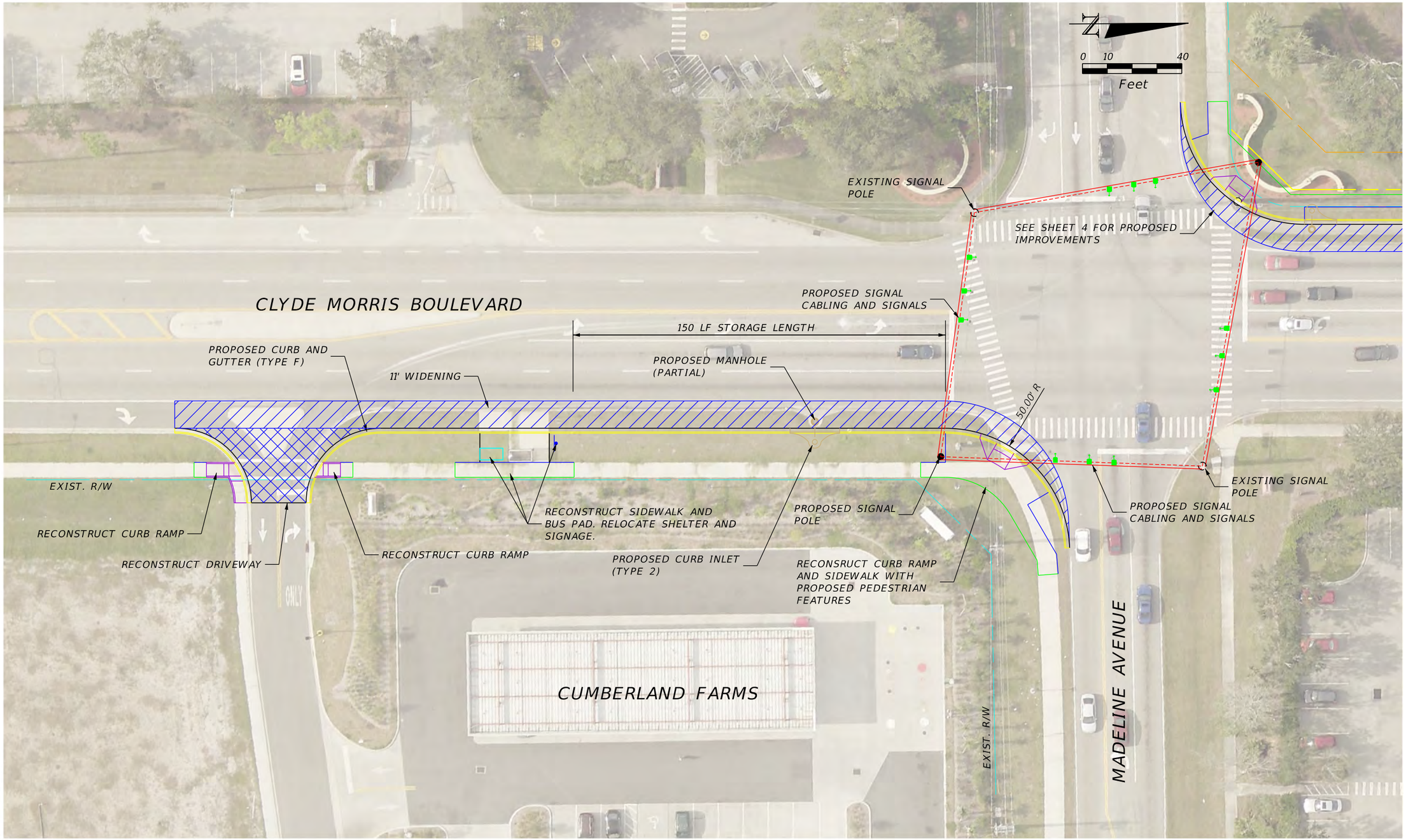

FIGURE 6

REVISIONS				VANASSE HANGEN BRUSTLIN, INC. 225. E. ROBINSON STREET ORLANDO, FL 32801 CERTIFICATE OF AUTHORIZATION 3932	CITY OF PORT ORANGE			IMPROVEMENT DIAGRAM OF CLYDE MORRIS BLVD. & MADELINE AVE.	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					CR 483	VOLUSIA			2

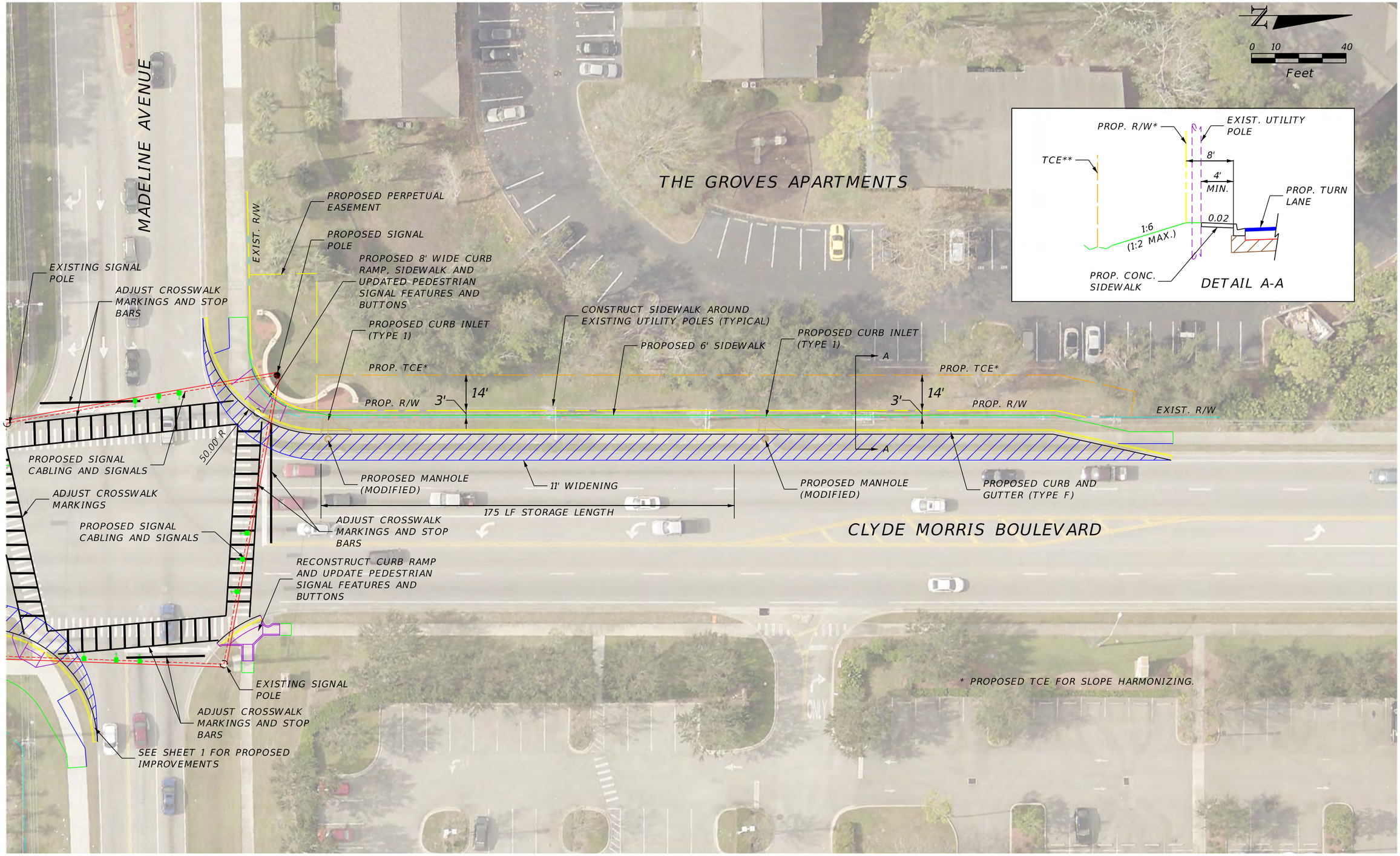

FIGURE 7

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

VANASSE HANGEN BRUSTLIN, INC.
225. E. ROBINSON STREET
ORLANDO, FL 32801
CERTIFICATE OF AUTHORIZATION 3932

CITY OF PORT ORANGE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 483	VOLUSIA	

IMPROVEMENT DIAGRAM OF
CLYDE MORRIS BLVD. & MADELINE AVE.

SHEET NO. 3

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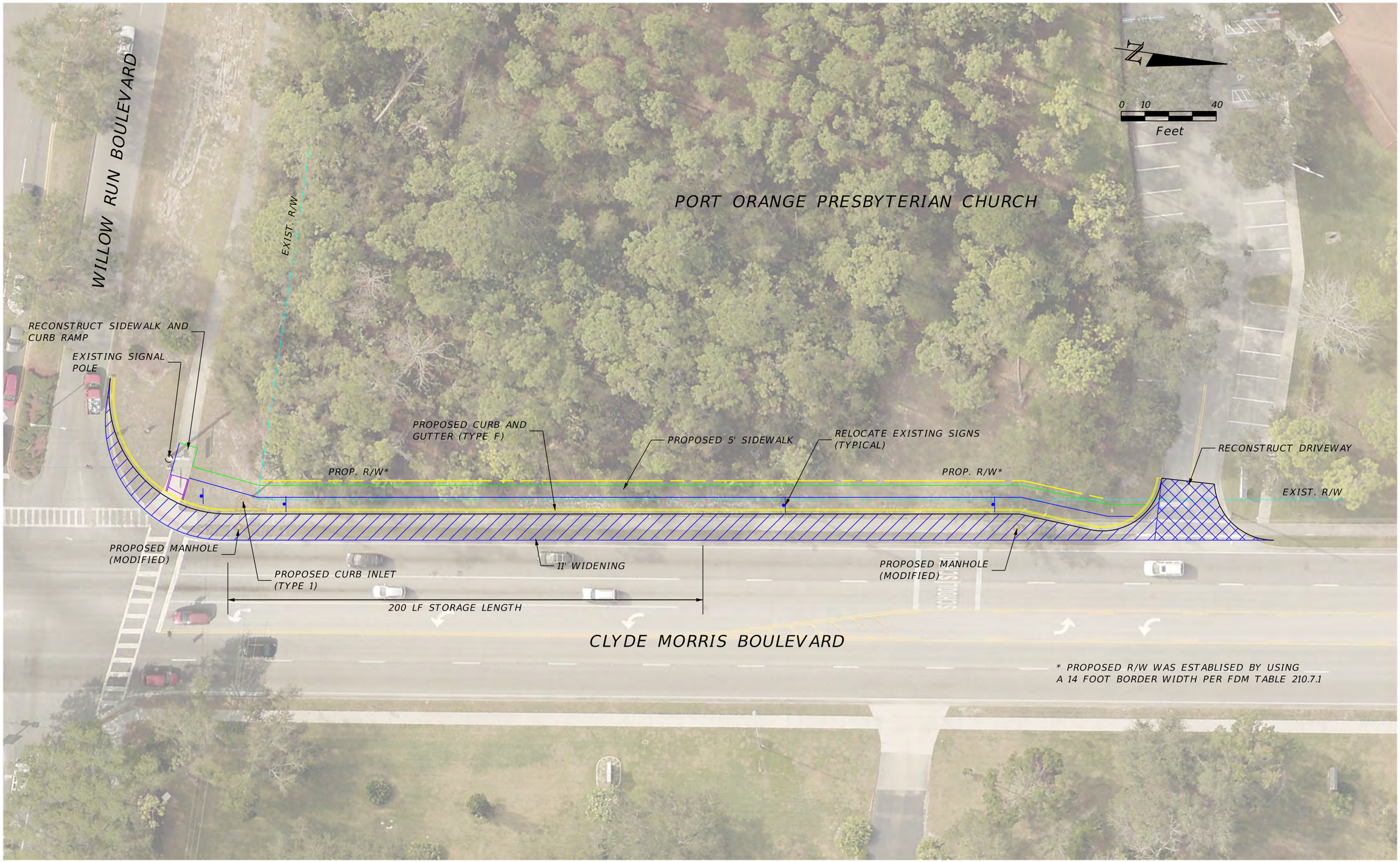


FIGURE 8

REVISIONS				VANASSE HANGEN BRUSTLIN, INC. 225. E. ROBINSON STREET ORLANDO, FL 32801 CERTIFICATE OF AUTHORIZATION 3932	CITY OF PORT ORANGE			IMPROVEMENT DIAGRAM FOR CLYDE MORRIS BLVD. & WILLOW RUN BLVD.	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					CR 483	VOLUSIA			4

RECOMMENDATIONS

Based upon the crash analysis, qualitative assessment, field observations, intersection analysis, B/C analysis and engineering judgment, the following modifications are recommended to improve the safety and operation of the study intersections:

Clyde Morris Boulevard at Reed Canal Road

- **Provide an exclusive northbound right turn lane.**
- It is suggested to upgrade the existing lighting along Clyde Morris Boulevard to LED lighting and add four additional light poles to meet the intersection retrofit criteria**.**
- It is recommended to remove the two-way left turn lane pavement markings between the westbound left turn lane at Clyde Morris Boulevard and Reed Canal Road intersection and the eastbound left turn lane at Reed Canal Road and Red Sail Lane intersection. Extend the storage for the westbound left turn lane at Clyde Morris Boulevard and Reed Canal Road intersection (to provide approximately 200 feet of total storage) by clearly defining this lane and the eastbound left turn lane at Reed Canal Road and Red Sail Lane intersection.
- Consider addressing the current ADA concerns at the time when the northbound right turn lane is constructed.

This improvement is based on the input provided in the application for a feasibility study completed by the City of Port Orange. **This modification can be implemented at an approximate cost of $514,709 and yields a B/C ratio of 1.27, which indicates that the anticipated benefits outweigh the estimated costs for the proposed modifications.**

Clyde Morris Boulevard at Madeline Avenue:

- **Provide an exclusive northbound right turn lane and an exclusive southbound right turn lane.**
- It is suggested to upgrade the existing lighting along Clyde Morris Boulevard to LED lighting and add three additional light poles to meet the intersection retrofit criteria**.**
- Consider extending the storage length for the eastbound left turn lane (approximately 100 feet) by removing the median between this lane and the westbound left turn lane at Madeline Avenue and McDonald's driveway.

- Consider addressing the current ADA concerns at the time when the right turn lanes are constructed on Clyde Morris Boulevard.

This improvement is based on the input provided in the application for a feasibility study completed by the County. **These modifications can be implemented at an approximate cost of $915,084 and yields a B/C ratio of 3.46, which indicates that the anticipated benefits outweigh the estimated costs for this recommended alternative.**

Clyde Morris Boulevard at Willow Run Boulevard

- **Provide an exclusive southbound right turn lane.**
- It is suggested to upgrade the existing lighting along Clyde Morris Boulevard to LED lighting and add four additional light poles to meet the intersection retrofit criteria.
- Consider providing a marked crosswalk on the east leg of the study intersection to cross City Center Parkway.
- Consider providing a sidewalk on the south side of Willow Run Boulevard/City Center Parkway as a long-term improvement. This will provide connectivity for the pedestrians travelling between the residential units south of Willow Run Boulevard and Port Orange City Hall.
- Consider addressing the current ADA concerns at the time when the southbound right turn lane is constructed.

This improvement is based on the input provided in the application for a feasibility study completed by the City of Port Orange. **This modification can be implemented at an approximate cost of $325,445 and yields a B/C ratio of 6.31, which indicates that the anticipated benefits outweigh the estimated costs for the proposed modifications**.

APPENDICES

APPENDIX A - 1:

Response to Comments

Memorandum

To: Colleen Nicoulin
Tim Burman

Date: April 24, 2020

Project #: 63308.01

From: Rajashekar Pemmanaboina
Srinivas Kandala
Keith Stimpson
Juan Camacho

Re: Clyde Morris Boulevard – Feasibility Study

The following are our responses to the comments provided on the Clyde Morris Boulevard – Feasibility Study.

1. General Comment Report-Wide: Add description, graphics, and infrastructure to describe how Pedestrian Traffic will be maintained during construction for each turn lane. If ped traffic can be maintained by apparent means, label "PED MOT is APPARENT".
   The comment is noted. Please note that this is a planning level feasibility study and this task is out of scope for this study.
2. General Comment Report-Wide: Strike out the phrase "Consider addressing the current ADA concerns" and replace with the descriptions, graphics, and estimates to bring the existing infrastructure into ADA compliance…a fundamental of LAP Projects.
   The comment is noted. Please note that this is a planning level feasibility study and this task is out of scope for this study.
3. General Comment Report-Wide: Update Engineer's Opinion of Probable Cost for each turn lane based upon Local Agency's comments.
   The comment is noted. Please note that there is no need to update costs based on the responses to the local agency's comments.
4. General Comment Report-Wide: Update Cost Benefit Ratios for each turn lane based upon Local Agency's comments.
   The comment is noted. Please note that there is no need to update B/C ratios based on the responses to the local agency's comments.
5. General Comment Report-Wide: Conduct Pre-Application Meeting or Conference Call with Volusia County to determine how many Use Permits will be required and any special surface course material other than SP 12.5 for turn lanes.
   The comment is noted. Please note that this is a planning level feasibility study and this task is out of scope for this study.
6. PDF 11: Description of West Leg of Minor Street should be "Willow Run Boulevard; four-lane divided" in lieu of "two-lane undivided." (Best seen on PDF 14.)
   The comment is noted and the description regarding Willow Run Boulevard will be updated.

7. PDF 31:(NB Clyde Morris to EB Reed Canal)
    a) Currently shows no separation from new turn lane to proposed sidewalk. Provide minimum 2.5-foot utility strip (4-ft desired). Add retaining wall (or curb) the entire length of new sidewalk with one-foot clearance from ROW line to back of new retaining wall.
    The comment is noted. Currently there is 5-foot utility strip and the R/W is 2 feet from back of sidewalk. Since R/W acquisition is anticipated, it is assumed that grade changes will be harmonized on the remaining parcel as part of the agreement.
    b) Estimate geotechnical services for global stability analysis of retaining wall (or curb).
    The comment is noted. Please note that this is a planning level feasibility study and this task is out of scope for this study.
    c) Specify 2-foot stripe, 4-foot skip stripe with raised pavement markers upon Clyde Morris Southbound to Reed Canal EB to mitigate dedicated Clyde Morris Southbound left turning traffic from colliding with new, proposed turning traffic from Northbound Clyde Morris to Eastbound Reed Canal.
    The comment is noted. The Southbound left turning traffic must yield to right turning northbound traffic. Please note that this is a planning level feasibility study and 2-4 Skip stripes can be added as part of final design (out of scope for this study) for the southbound left turn to eastbound Reed Canal.
    d) Specify realignment of existing east-west crosswalk across Clyde Morris and its existing stop bar (NW corner to NE corner) to provide ADA compliant individual ramps from new sidewalk to crosswalks.
    The comment is noted, and figure will be revised accordingly.
    e) Specify separate ped signal posts and appurtenances to provide compliant ped signal call buttons.
    This comment is noted, and the note will be expanded to state compliant pedestrian features for each ramp.
    f) Specify width of proposed, additional ROW.
    The comment is noted. The width of proposed additional ROW will be specified in the improvement diagram.
    g) Provide Advisory notice to the Local Agency that the Agency must start ROW acquisition with the D5 ROW office and not contact the businesses independently.
    The comment is noted. Please note that this is a planning level feasibility study and this task is out of scope for this study.
    h) Provide options for conference with R2CTPO and Local Agency for how to allow SB Clyde Morris signalized left and new, proposed, right turn to both safely utilize single, EB Reed Canal through lane.
    The comment is noted. Please note that this is a planning level feasibility study and-

this task is out of scope for this study.

8. PDF 32:(NB Clyde Morris to EB Madeline)
    a) Specify realignment of existing east-west crosswalk across Clyde Morris and its existing stop bar (NW corner to NE corner) to provide ADA compliant individual ramps from new sidewalk to crosswalks.
    This comment is noted but separating the ramps would reduce queue lengths in the left turning lanes. That is why we are proposing extra wide ramps (8 feet wide) to compensate.
    b) Specify separate ped signal posts and appurtenances to provide compliant ped signal call buttons.
    Please see above response.
    c) Provide options for conference with R2CTPO and Local Agency for how to allow SB Clyde Morris signalized left and new, proposed, right turn to both safely utilize single, EB Madeline through lane.
    The comment is noted. Please note that this is a planning level feasibility study and this task is out of scope for this study.
9. PDF 33:(SB Clyde Morris to WB Madeline)
    a) Where sidewalk widening is required to miss existing utility poles, specify a minimum of 4-feet of 2% maximum grade compliant accessible route clear of subject utility pole with any balance to the existing back of curb replaced at greater than 2%.
    The comment is noted, and improvement diagram will be updated accordingly.
    b) Specify retaining wall or curb the entire length of the new ROW.
    The comment is noted. Since ROW acquisition is anticipated, it is assumed that grade changes will be harmonized on the remaining parcel as part of the agreement.
    c) Estimate geotechnical services for global stability analysis of retaining wall (or curb).
    The comment is noted. Please note that this is a planning level feasibility study and this task is out of scope for this study.
    d) Specify a 20-foot wide easement from new ROW to relocated NW signal pole complete with a ten-foot easement surrounding the new signal pole.
    The comment is noted, and Figure 7 is updated accordingly.
    e) Amend simple corner clip additional ROW to curvilinear additional ROW to create proposed ROW one foot from curvilinear "Groves Apartment" sign.
    The comment is noted, and Figure 7 is updated accordingly.
    f) Specify realignment of existing east-west crosswalk across Clyde Morris and north-south crosswalk across Madeline and their existing stop bars (NW corner to NE corner to SW corner) to provide ADA compliant individual ramps from new sidewalk to crosswalks.

This comment is noted but separating the ramps would reduce queue lengths in the left turning lanes. That is why we are proposing extra wide ramps (8 feet wide) to compensate.

g) Specify separate ped signal posts and appurtenances to provide compliant ped signal call buttons.
This is not needed. Please see the above response for more information. They will be upgraded to current standards.

h) Specify proposed, additional ROW as 25-feet in lieu of 14-feet and carry through the existing Church driveway apron. (12′ turn lane, 2′ Type F C&G, 4′ utility strip, 5′ sidewalk, 10″ wide retaining wall or curb, and 1′ separation from retaining wall or curb to new ROW.)
The comment is noted. There is no church at this location.

i) Provide Advisory notice to the Local Agency that the Agency must start ROW acquisition with the D5 ROW office and not contact the Church independently.
The comment is noted. Please note that this is a planning level feasibility study and this task is out of scope for this study.

10. PDF 34:(SB Clyde Morris to WB Willow Run Boulevard)

a) Redraft proposed turn lane to discharge into existing Westbound shoulder lane of Willow Run Boulevard.
The comment is noted. Without the vertical data on this study, it is not possible to determine where the water is going. So, at this stage, matching existing drainage is preferred.

b) Currently shows no separation from new turn lane to proposed sidewalk. Provide minimum 2.5-foot utility strip (4-ft desired). Add retaining wall (or curb) the entire length of new sidewalk with one-foot clearance from ROW line to back of new retaining wall.
The comment is noted. The exhibit shows a 5-foot utility strip, sidewalk and prop. ROW is set 2 feet behind the sidewalk. Since ROW acquisition is anticipated, it is assumed that grade changes will be harmonized on the remaining parcel as part of the agreement. Curbs and/or retaining wall not anticipated.

c) Estimate geotechnical services for global stability analysis of retaining wall (or curb).
The comment is noted. Please note that this is a planning level feasibility study and this task is out of scope for this study.

d) Provide 4-ft minimum clearance from back of new curb & gutter to existing signal pole identified at NW corner of existing intersection. (May require new pole.)
The comment is noted. Please note that a 10-foot clearance has been already provided.

e) Specify 2-foot stripe, 4-foot skip stripe with raised pavement markers upon Clyde Morris Southbound to mitigate dedicated Clyde Morris Northbound left turning traffic from colliding with new, proposed turning traffic from Southbound Clyde Morris to Westbound Willow Run.

The comment is noted. The northbound left turning traffic must yield to right turning southbound traffic. Please note that this is a planning level feasibility study and 2-4 Skip stripes can be added as part of final design (out of scope for this study).

f) Specify 150-feet of 6" solid white stripe between existing ten-foot lanes Westbound upon Willow Run Boulevard to further mitigate collisions between the same two turning movements described in 3.e. above.

The comment is noted. The 6" solid white stripe can be added as part of the final design (out of scope for this study) for the conceptual improvements.

g) Specify realignment of existing east-west crosswalk across Clyde Morris and its existing stop bar (NW corner to NE corner) to provide ADA compliant individual ramps from new sidewalk to crosswalks.

The comment is noted. This is not needed on the NW corner, but will provide a wider ramp like other locations. The NE corner already has 2 ramps. But the E-W ramp can be reconstructed to facilitate a more perpendicular route across Clyde Morris.

h) Specify separate ped signal posts and appurtenances to provide compliant ped signal call buttons.

The comment is noted. Our intent is to upgrade all ped features as needed to current standards.

i) Specify proposed, additional ROW as 25-feet in lieu of 14-feet and carry through the existing Church driveway apron. (12' turn lane, 2' Type F C&G, 4' utility strip, 5' sidewalk, 10" wide retaining wall or curb, and 1' separation from retaining wall or curb to new ROW.)

The comment is noted. We are proposing 11' turn lane (which is standard), Type F C&G, 5' utility strip 5' sidewalk and proposed ROW 2' off from the sidewalk. Since ROW acquisition is anticipated, it is assumed that grade changes will be harmonized on the remaining parcel as part of the agreement. Additional ROW and associated costs not required.

j) Provide Advisory notice to the Local Agency that the Agency must start ROW acquisition with the D5 ROW office and not contact the Church independently.

The comment is noted. Please note that this is a planning level feasibility study and this task is out of scope for this study.

k) Specify additional "SCHOOL" message marking upon new turn lane in alignment with existing messages.

The comment is noted. Please note that this is a planning level feasibility study and this task is out of scope for this study

l) Specify new ped ramps without crosswalk at Church driveway.
The comment is noted. The ramps will be provided.

11. There are existing utilities (8" San. Sewer Forcemain, 12" Watermain, telecom, and a 6" Gas Main) in the vicinity of the proposed improvements to a Clyde Morris turn lane at Reed Canal Rd.
The comment is noted. Please note that this is a planning level feasibility study, and the vertical elements must be vetted during the design phase.

APPENDIX A - 2:

Traffic Data

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

Start Date : January 14, 2020 Start Time 00:00
Stop Date : January 14, 2020 Stop Time 24:00
County : Volusia
Location : Clyde Morris Blvd south of Madeline Ave

VHB Project #: 63308.01

14-Jan-20 **Lane 1**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	13	7	2	2	3	3	8	20	49	65	61	64
30	18	2	4	2	4	3	5	20	65	65	52	82
45	10	7	7	3	2	6	10	21	61	75	63	65
00	8	6	2	2	7	9	6	44	70	66	68	79
Hr Total	**49**	**22**	**15**	**9**	**16**	**21**	**29**	**105**	**245**	**271**	**244**	**290**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	76	94	98	93	110	125	125	98	67	58	34	20
30	112	89	75	111	98	145	130	110	54	51	29	18
45	74	79	80	100	114	109	127	91	58	44	37	20
00	88	108	90	102	127	143	127	76	69	39	27	19
Hr Total	**350**	**370**	**343**	**406**	**449**	**522**	**509**	**375**	**248**	**192**	**127**	**77**

24 Hour Total : 5,284
AM Peak Hour begins : 11:00 AM Peak Volume : 290 AM Peak Hour Factor : 0.88
PM Peak Hour begins : 17:45 PM Peak Volume : 525 PM PeaK Hour Factor : 0.92

14-Jan-20 **Lane 2**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	8	2	4	3	1	2	17	38	68	81	60	56
30	5	2	4	0	2	6	16	31	79	80	68	59
45	5	4	3	1	4	10	19	41	72	74	50	65
00	5	1	1	0	3	12	27	59	83	76	57	64
Hr Total	**23**	**9**	**12**	**4**	**10**	**30**	**79**	**169**	**302**	**311**	**235**	**244**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	66	86	65	90	102	106	113	63	51	36	21	8
30	75	76	73	81	82	90	109	60	47	23	26	6
45	71	75	70	80	81	82	94	63	47	22	15	6
00	70	77	87	80	97	126	81	56	39	22	10	8
Hr Total	**282**	**314**	**295**	**331**	**362**	**404**	**397**	**242**	**184**	**103**	**72**	**28**

24 Hour Total : 4,442
AM Peak Hour begins : 8:45 AM Peak Volume : 318 AM Peak Hour Factor : 0.96
PM Peak Hour begins : 17:45 PM Peak Volume : 442 PM PeaK Hour Factor : 0.88

14-Jan-20 **Total Volume for All Lanes**

End Time	00	01	02	03	04	05	06	07	08	09	10	11
15	21	9	6	5	4	5	25	58	117	146	121	120
30	23	4	8	2	6	9	21	51	144	145	120	141
45	15	11	10	4	6	16	29	62	133	149	113	130
00	13	7	3	2	10	21	33	103	153	142	125	143
Hr Total	**72**	**31**	**27**	**13**	**26**	**51**	**108**	**274**	**547**	**582**	**479**	**534**

End Time	12	13	14	15	16	17	18	19	20	21	22	23
15	142	180	163	183	212	231	238	161	118	94	55	28
30	187	165	148	192	180	235	239	170	101	74	55	24
45	145	154	150	180	195	191	221	154	105	66	52	26
00	158	185	177	182	224	269	208	132	108	61	37	27
Hr Total	**632**	**684**	**638**	**737**	**811**	**926**	**906**	**617**	**432**	**295**	**199**	**105**

24 Hour Total : 9,726
AM Peak Hour begins : 8:45 AM Peak Volume : 593 AM Peak Hour Factor : 0.97
PM Peak Hour begins : 17:45 PM Peak Volume : 967 PM PeaK Hour Factor : 0.90

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County Volusia **City** Port Orange

Intersection Clyde Morris Blvd **&** Reed Canal Rd

Date January 14, 2020 **All Vehicles**

VHB Project #: 63308.01

AM Peak Hour

Time Period	Clyde Morris Blvd Northbound			Clyde Morris Blvd Southbound			Reed Canal Rd Eastbound			Reed Canal Rd Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM - 7:15 AM	0	141	15	13	96	0	0	0	0	18	0	10
7:15 AM - 7:30 AM	0	192	27	23	118	0	0	0	0	33	0	24
7:30 AM - 7:45 AM	0	268	50	36	121	0	0	0	0	31	0	45
7:45 AM - 8:00 AM	0	275	54	41	151	0	0	0	0	40	0	35
8:00 AM - 8:15 AM	0	212	108	49	167	0	0	0	0	49	0	26
8:15 AM - 8:30 AM	0	180	72	54	147	0	0	0	0	61	0	39
8:30 AM - 8:45 AM	0	187	34	22	136	0	0	0	0	63	0	21
8:45 AM - 9:00 AM	0	171	25	16	123	0	0	0	0	28	0	27
TOTAL	0	1,626	385	254	1,059	0	0	0	0	323	0	227
Peak Hour												
7:30 AM - 8:30 AM	**0**	**935**	**284**	**180**	**586**	**0**	**0**	**0**	**0**	**181**	**0**	**145**

Mid-day Peak Hour

Time Period	Clyde Morris Blvd Northbound			Clyde Morris Blvd Southbound			Reed Canal Rd Eastbound			Reed Canal Rd Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
12:00 PM - 12:15 PM	0	164	24	24	181	0	0	0	0	61	0	25
12:15 PM - 12:30 PM	1	185	35	15	190	0	0	0	0	44	0	25
12:30 PM - 12:45 PM	0	160	30	28	189	0	0	0	0	40	0	32
12:45 PM - 1:00 PM	0	191	31	27	202	0	0	0	0	50	0	22
1:00 PM - 1:15 PM	0	183	30	25	178	0	0	0	0	40	0	20
1:15 PM - 1:30 PM	0	168	28	7	155	0	0	0	0	35	0	20
1:30 PM - 1:45 PM	0	200	32	19	168	0	0	0	0	43	0	23
1:45 PM - 2:00 PM	0	174	30	25	190	0	0	0	0	52	0	21
TOTAL	1	1,425	240	170	1,453	0	0	0	0	365	0	188
Peak Hour												
12:00 PM - 1:00 PM	**1**	**700**	**120**	**94**	**762**	**0**	**0**	**0**	**0**	**195**	**0**	**104**

PM Peak Hour

Time Period	Clyde Morris Blvd Northbound			Clyde Morris Blvd Southbound			Reed Canal Rd Eastbound			Reed Canal Rd Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2:00 PM - 2:15 PM	0	201	31	19	174	0	0	0	0	37	0	18
2:15 PM - 2:30 PM	0	172	25	39	211	0	0	0	0	41	0	17
2:30 PM - 2:45 PM	0	190	45	35	177	0	0	0	0	49	0	23
2:45 PM - 3:00 PM	0	200	44	26	129	0	0	0	0	51	0	17
3:00 PM - 3:15 PM	1	205	36	22	163	0	0	0	0	32	0	16
3:15 PM - 3:30 PM	0	192	39	29	254	0	0	0	0	48	0	24
3:30 PM - 3:45 PM	0	186	45	37	250	0	0	0	0	92	0	39
3:45 PM - 4:00 PM	0	191	34	31	259	0	0	0	0	93	0	32
4:00 PM - 4:15 PM	0	174	30	32	229	0	0	0	0	57	0	32
4:15 PM - 4:30 PM	0	178	31	33	239	0	0	0	0	56	0	19
4:30 PM - 4:45 PM	0	240	48	38	244	0	0	0	0	49	0	23
4:45 PM - 5:00 PM	0	221	24	35	271	0	0	0	0	53	0	35
5:00 PM - 5:15 PM	0	192	27	35	298	0	0	0	0	80	0	30
5:15 PM - 5:30 PM	0	167	23	41	309	0	0	0	0	58	0	33
5:30 PM - 5:45 PM	0	162	33	29	256	0	0	0	0	49	0	32
5:45 PM - 6:00 PM	0	192	31	30	234	0	0	0	0	53	0	19
TOTAL	1	3,063	546	511	3,697	0	0	0	0	898	0	409
Peak Hour												
4:30 PM - 5:30 PM	**0**	**820**	**122**	**149**	**1,122**	**0**	**0**	**0**	**0**	**240**	**0**	**121**

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County Volusia **City** Port Orange

Intersection Clyde Morris Blvd **&** Reed Canal Rd

Date January 14, 2020 **Trucks**

VHB Project #: 63308.01

AM Peak Hour

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM - 7:15 AM	0	0	0	2	6	0	0	0	0	1	0	0
7:15 AM - 7:30 AM	0	1	0	0	9	0	0	0	0	2	0	0
7:30 AM - 7:45 AM	0	5	0	1	3	0	0	0	0	0	0	1
7:45 AM - 8:00 AM	0	3	0	2	6	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	3	5	0	3	0	0	0	0	1	0	3
8:15 AM - 8:30 AM	0	6	0	1	4	0	0	0	0	2	0	1
8:30 AM - 8:45 AM	0	3	1	0	3	0	0	0	0	1	0	1
8:45 AM - 9:00 AM	0	6	0	0	3	0	0	0	0	1	0	1
TOTAL	0	27	6	6	37	0	0	0	0	8	0	7
Peak Hour												
7:30 AM - 8:30 AM	**0**	**17**	**5**	**4**	**16**	**0**	**0**	**0**	**0**	**3**	**0**	**5**
	0%	2%	2%	2%	3%	0%	0%	0%	0%	2%	0%	3%

Mid-day

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
12:00 PM - 12:15 PM	0	9	1	1	3	0	0	0	0	0	0	0
12:15 PM - 12:30 PM	0	3	0	1	4	0	0	0	0	0	0	1
12:30 PM - 12:45 PM	0	3	0	1	2	0	0	0	0	1	0	1
12:45 PM - 1:00 PM	0	3	1	0	4	0	0	0	0	0	0	0
1:00 PM - 1:15 PM	0	1	0	0	2	0	0	0	0	0	0	0
1:15 PM - 1:30 PM	0	5	1	0	3	0	0	0	0	0	0	0
1:30 PM - 1:45 PM	0	3	0	2	2	0	0	0	0	0	0	0
1:45 PM - 2:00 PM	0	7	0	0	4	0	0	0	0	1	0	0
TOTAL	0	34	3	5	24	0	0	0	0	2	0	2
Peak Hour												
12:15 PM - 1:15 PM	**0**	**10**	**1**	**2**	**12**	**0**	**0**	**0**	**0**	**1**	**0**	**2**
	0%	1%	1%	2%	2%	0%	0%	0%	0%	1%	0%	2%

PM Peak Hour

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2:00 PM - 2:15 PM	0	2	0	1	11	0	0	0	0	1	0	0
2:15 PM - 2:30 PM	0	1	1	0	3	0	0	0	0	0	0	1
2:30 PM - 2:45 PM	0	1	1	0	2	0	0	0	0	0	0	1
2:45 PM - 3:00 PM	0	4	1	1	2	0	0	0	0	0	0	0
3:00 PM - 3:15 PM	0	3	1	0	6	0	0	0	0	1	0	0
3:15 PM - 3:30 PM	0	1	0	1	4	0	0	0	0	0	0	0
3:30 PM - 3:45 PM	0	3	0	2	4	0	0	0	0	3	0	1
3:45 PM - 4:00 PM	0	6	1	1	0	0	0	0	0	1	0	1
4:00 PM - 4:15 PM	0	4	0	0	3	0	0	0	0	0	0	1
4:15 PM - 4:30 PM	0	2	1	0	2	0	0	0	0	1	0	0
4:30 PM - 4:45 PM	0	4	1	2	1	0	0	0	0	0	0	1
4:45 PM - 5:00 PM	0	5	0	0	4	0	0	0	0	2	0	1
5:00 PM - 5:15 PM	0	2	0	0	0	0	0	0	0	0	0	2
5:15 PM - 5:30 PM	0	5	0	0	0	0	0	0	0	0	0	1
5:30 PM - 5:45 PM	0	2	0	0	1	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	4	0	0	0	0	0	0	0	0	0	0
TOTAL	0	49	7	8	43	0	0	0	0	9	0	10
Peak Hour												
4:30 PM - 5:30 PM	**0**	**16**	**1**	**2**	**5**	**0**	**0**	**0**	**0**	**2**	**0**	**5**
	0%	2%	1%	1%	0%	0%	0%	0%	0%	1%	0%	4%

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County Volusia **City** Port Orange

Intersection Clyde Morris Blvd **&** Reed Canal Rd

Date January 14, 2020 **U-Turns & RTOR**

VHB Project #: 63308.01

AM Peak Hour

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	6
7:15 AM - 7:30 AM	0	0	1	0	0	0	0	0	0	0	0	16
7:30 AM - 7:45 AM	0	0	11	0	0	0	0	0	0	0	0	9
7:45 AM - 8:00 AM	0	0	5	0	0	0	0	0	0	0	0	13
8:00 AM - 8:15 AM	0	0	9	0	0	0	0	0	0	0	0	14
8:15 AM - 8:30 AM	0	0	2	0	0	0	0	0	0	0	0	14
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	8
8:45 AM - 9:00 AM	0	0	5	0	0	0	0	0	0	0	0	17
TOTAL	0	0	33	0	0	0	0	0	0	0	0	97
Peak Hour												
7:15 AM - 8:15 AM	**0**	**0**	**26**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**52**

Mid-day

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
12:00 PM - 12:15 PM	0	0	6	0	0	0	0	0	0	0	0	14
12:15 PM - 12:30 PM	1	0	3	0	0	0	0	0	0	0	0	15
12:30 PM - 12:45 PM	0	0	5	0	0	0	0	0	0	0	0	22
12:45 PM - 1:00 PM	0	0	1	0	0	0	0	0	0	0	0	14
1:00 PM - 1:15 PM	0	0	3	0	0	0	0	0	0	0	0	14
1:15 PM - 1:30 PM	0	0	1	0	0	0	0	0	0	0	0	12
1:30 PM - 1:45 PM	0	0	3	0	0	0	0	0	0	0	0	14
1:45 PM - 2:00 PM	0	0	5	1	0	0	0	0	0	0	0	10
TOTAL	1	0	27	1	0	0	0	0	0	0	0	115
Peak Hour												
12:00 PM - 1:00 PM	**1**	**0**	**15**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**65**

PM Peak Hour

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2:00 PM - 2:15 PM	0	0	2	0	0	0	0	0	0	0	0	11
2:15 PM - 2:30 PM	0	0	5	0	0	0	0	0	0	0	0	8
2:30 PM - 2:45 PM	0	0	6	0	0	0	0	0	0	0	0	9
2:45 PM - 3:00 PM	0	0	1	0	0	0	0	0	0	0	0	13
3:00 PM - 3:15 PM	1	0	5	0	0	0	0	0	0	0	0	10
3:15 PM - 3:30 PM	0	0	1	0	0	0	0	0	0	0	0	14
3:30 PM - 3:45 PM	0	0	4	0	0	0	0	0	0	0	0	19
3:45 PM - 4:00 PM	0	0	9	0	0	0	0	0	0	0	0	14
4:00 PM - 4:15 PM	0	0	2	0	0	0	0	0	0	0	0	17
4:15 PM - 4:30 PM	0	0	7	0	0	0	0	0	0	0	0	9
4:30 PM - 4:45 PM	0	0	6	0	0	0	0	0	0	0	0	12
4:45 PM - 5:00 PM	0	0	1	0	0	0	0	0	0	0	0	15
5:00 PM - 5:15 PM	0	0	2	0	0	0	0	0	0	0	0	16
5:15 PM - 5:30 PM	0	0	3	0	0	0	0	0	0	0	0	18
5:30 PM - 5:45 PM	0	0	4	0	0	0	0	0	0	0	0	21
5:45 PM - 6:00 PM	0	0	5	0	0	0	0	0	0	0	0	11
TOTAL	1	0	63	0	0	0	0	0	0	0	0	217
Peak Hour												
3:30 PM - 4:30 PM	**0**	**0**	**22**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**59**

Pedestrian & Bicycle Summary

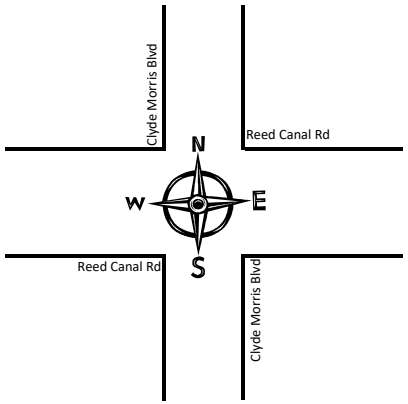
Project #: 63308.01 **NB/SB:** Clyde Morris Blvd

Date: 1/14/2020 **EB/WB:** Reed Canal Rd

Hour

		7:00	8:00	12:00	13:00	14:00	15:00	16:00	17:00	
		1	2	3	4	5	6	7	8	
Eastbound	▶ Bike	0	0	0	0	1	0	0	0	**1**
	Ped	2	2	0	0	0	0	0	0	**4**
Westbound	◀ Bike	0	0	0	0	0	0	0	0	**0**
	Ped	0	0	0	0	0	2	0	0	**2**

Hour	Southbound Ped ▼	Southbound Bike ▼	Northbound Ped ▲	Northbound Bike ▲
1 7:00	0	0	0	0
2 8:00	0	0	0	0
3 12:00	0	0	0	0
4 13:00	0	0	0	0
5 14:00	0	0	0	0
6 15:00	0	0	0	0
7 16:00	0	0	0	0
8 17:00	0	0	0	0
	0	**0**	**0**	**0**



Hour	Southbound Ped ▼	Southbound Bike ▼	Northbound Ped ▲	Northbound Bike ▲	Hour
1 7:00	4	1	2	1	1 7:00
2 8:00	9	1	3	0	2 8:00
3 12:00	0	1	0	0	3 12:00
4 13:00	1	3	0	1	4 13:00
5 14:00	1	3	1	0	5 14:00
6 15:00	3	0	2	1	6 15:00
7 16:00	0	0	7	1	7 16:00
8 17:00	0	2	0	0	8 17:00
	18	**11**	**15**	**4**	

		7:00	8:00	12:00	13:00	14:00	15:00	16:00	17:00	
Eastbound	▶ Bike	1	1	0	0	0	0	0	1	**3**
	Ped	2	6	0	0	0	0	0	1	**9**
Westbound	◀ Bike	0	0	0	0	0	1	0	0	**1**
	Ped	0	0	0	0	0	8	1	0	**9**
		1	2	3	4	5	6	7	8	

Hour

57 **20**

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County Volusia **City** Port Orange

Intersection Clyde Morris Blvd **&** Madeline Ave

Date January 14, 2020 **All Vehicles**

VHB Project #: 63308.01

AM Peak Hour

Time Period	Clyde Morris Blvd Northbound			Clyde Morris Blvd Southbound			Madeline Ave Eastbound			Madeline Ave Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM - 7:15 AM	23	115	6	19	82	15	39	22	13	11	24	9
7:15 AM - 7:30 AM	35	136	8	19	104	20	52	39	31	32	38	16
7:30 AM - 7:45 AM	28	205	5	21	114	29	74	36	27	27	50	22
7:45 AM - 8:00 AM	41	223	14	22	139	27	89	34	38	31	44	20
8:00 AM - 8:15 AM	30	188	11	17	169	33	84	35	31	22	44	13
8:15 AM - 8:30 AM	22	144	13	18	139	33	71	38	26	33	44	25
8:30 AM - 8:45 AM	31	157	16	20	142	24	44	31	21	29	40	14
8:45 AM - 9:00 AM	25	136	10	16	98	22	44	39	26	35	41	24
TOTAL	235	1,304	83	152	987	203	497	274	213	220	325	143
Peak Hour												
7:30 AM - 8:30 AM	**121**	**760**	**43**	**78**	**561**	**122**	**318**	**143**	**122**	**113**	**182**	**80**

Mid-day Peak Hour

Time Period	Clyde Morris Blvd Northbound			Clyde Morris Blvd Southbound			Madeline Ave Eastbound			Madeline Ave Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
12:00 PM - 12:15 PM	18	140	16	26	171	38	34	55	30	35	39	19
12:15 PM - 12:30 PM	17	179	18	25	175	43	34	45	23	31	32	17
12:30 PM - 12:45 PM	28	121	16	32	137	27	51	36	15	35	32	11
12:45 PM - 1:00 PM	15	191	13	34	184	35	38	55	26	30	30	14
1:00 PM - 1:15 PM	29	124	20	28	136	32	54	46	17	32	23	22
1:15 PM - 1:30 PM	30	137	15	18	134	29	53	40	23	36	33	14
1:30 PM - 1:45 PM	14	178	15	20	162	33	39	46	17	25	35	19
1:45 PM - 2:00 PM	23	144	21	27	170	38	49	42	17	36	41	22
TOTAL	174	1,214	134	210	1,269	275	352	365	168	260	265	138
Peak Hour												
12:00 PM - 1:00 PM	**78**	**631**	**63**	**117**	**667**	**143**	**157**	**191**	**94**	**131**	**133**	**61**

PM Peak Hour

Time Period	Clyde Morris Blvd Northbound			Clyde Morris Blvd Southbound			Madeline Ave Eastbound			Madeline Ave Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2:00 PM - 2:15 PM	23	157	22	23	160	34	50	44	25	41	36	17
2:15 PM - 2:30 PM	25	142	21	40	166	28	28	52	33	29	34	13
2:30 PM - 2:45 PM	25	170	13	30	147	33	62	60	32	32	41	22
2:45 PM - 3:00 PM	39	175	28	32	119	32	62	43	29	39	31	15
3:00 PM - 3:15 PM	36	151	12	30	101	36	57	64	28	40	48	25
3:15 PM - 3:30 PM	23	160	23	21	190	61	70	52	19	38	30	18
3:30 PM - 3:45 PM	22	161	20	40	233	74	56	50	35	43	43	10
3:45 PM - 4:00 PM	37	170	27	40	238	61	37	63	44	36	45	19
4:00 PM - 4:15 PM	27	127	17	40	178	48	48	65	36	38	45	23
4:15 PM - 4:30 PM	31	183	35	39	188	49	43	70	25	36	44	10
4:30 PM - 4:45 PM	36	203	14	35	177	48	56	61	47	38	45	14
4:45 PM - 5:00 PM	42	197	27	50	214	71	50	68	35	32	52	11
5:00 PM - 5:15 PM	50	165	24	39	221	56	43	65	49	28	56	18
5:15 PM - 5:30 PM	34	125	13	55	225	59	36	60	62	43	46	14
5:30 PM - 5:45 PM	24	148	18	38	228	52	53	67	43	26	44	12
5:45 PM - 6:00 PM	34	138	24	35	176	47	60	60	34	33	44	15
TOTAL	508	2,572	338	587	2,961	789	811	944	576	572	684	256
Peak Hour												
4:30 PM - 5:30 PM	**162**	**690**	**78**	**179**	**837**	**234**	**185**	**254**	**193**	**141**	**199**	**57**

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County Volusia **City** Port Orange

Intersection Clyde Morris Blvd **&** Madeline Ave

Date January 14, 2020 **Trucks**

VHB Project #: 63308.01

AM Peak Hour

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM - 7:15 AM	0	0	0	0	7	0	0	2	0	0	1	0
7:15 AM - 7:30 AM	0	2	0	1	4	1	0	0	0	0	0	0
7:30 AM - 7:45 AM	1	1	0	0	3	0	0	0	0	0	0	1
7:45 AM - 8:00 AM	1	2	1	0	5	1	1	2	0	1	0	0
8:00 AM - 8:15 AM	1	7	0	1	6	0	1	1	0	0	0	0
8:15 AM - 8:30 AM	3	5	0	0	3	0	0	1	0	1	1	0
8:30 AM - 8:45 AM	0	3	1	1	3	0	0	0	0	0	2	0
8:45 AM - 9:00 AM	1	5	0	1	1	2	3	1	1	1	0	0
TOTAL	7	25	2	4	32	4	5	7	1	3	4	1
Peak Hour												
7:30 AM - 8:30 AM	**6**	**15**	**1**	**1**	**17**	**1**	**2**	**4**	**0**	**2**	**1**	**1**
	5%	2%	2%	1%	3%	1%	1%	3%	0%	2%	1%	1%

Mid-day

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
12:00 PM - 12:15 PM	1	7	1	0	5	0	0	2	1	1	0	2
12:15 PM - 12:30 PM	0	4	0	1	5	0	1	1	1	0	1	0
12:30 PM - 12:45 PM	1	3	0	0	2	0	0	0	0	0	3	0
12:45 PM - 1:00 PM	1	1	1	2	1	0	2	0	0	0	0	0
1:00 PM - 1:15 PM	1	1	1	0	2	0	0	2	0	1	1	0
1:15 PM - 1:30 PM	0	3	0	0	3	0	2	3	0	3	0	0
1:30 PM - 1:45 PM	0	2	1	0	1	0	2	1	0	0	2	0
1:45 PM - 2:00 PM	0	7	1	0	3	0	1	2	1	0	1	0
TOTAL	4	28	5	3	22	0	8	11	3	5	8	2
Peak Hour												
12:00 PM - 1:00 PM	**3**	**15**	**2**	**3**	**13**	**0**	**3**	**3**	**2**	**1**	**4**	**2**
	4%	2%	3%	3%	2%	0%	2%	2%	2%	1%	3%	3%

PM Peak Hour

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2:00 PM - 2:15 PM	2	0	1	3	12	0	0	1	0	1	1	1
2:15 PM - 2:30 PM	0	2	0	0	2	0	0	0	1	0	0	0
2:30 PM - 2:45 PM	0	1	0	0	2	1	1	2	1	0	2	0
2:45 PM - 3:00 PM	2	5	1	0	4	0	0	2	1	0	2	0
3:00 PM - 3:15 PM	1	3	0	0	2	1	2	0	0	0	2	0
3:15 PM - 3:30 PM	0	2	1	0	2	0	0	0	0	0	0	0
3:30 PM - 3:45 PM	1	4	0	0	6	2	1	1	0	0	1	0
3:45 PM - 4:00 PM	0	4	0	0	1	2	1	1	0	1	1	0
4:00 PM - 4:15 PM	0	3	0	1	2	0	0	2	0	0	1	0
4:15 PM - 4:30 PM	0	2	0	0	1	0	1	0	0	0	0	0
4:30 PM - 4:45 PM	1	7	0	0	1	0	0	0	0	1	0	0
4:45 PM - 5:00 PM	0	4	0	2	3	1	2	0	0	0	0	2
5:00 PM - 5:15 PM	2	3	0	0	1	0	0	0	1	0	0	1
5:15 PM - 5:30 PM	0	3	0	0	1	0	0	1	0	0	0	2
5:30 PM - 5:45 PM	0	2	2	0	1	0	2	0	0	1	0	0
5:45 PM - 6:00 PM	1	3	0	0	0	0	0	0	0	0	0	0
TOTAL	10	48	5	6	41	7	10	10	4	4	10	6
Peak Hour												
4:15 PM - 5:15 PM	**3**	**16**	**0**	**2**	**6**	**1**	**3**	**0**	**1**	**1**	**0**	**3**
	2%	2%	0%	1%	1%	0%	2%	0%	1%	1%	0%	5%

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County Volusia **City** Port Orange

Intersection Clyde Morris Blvd **&** Madeline Ave

Date January 14, 2020 **U-Turns & RTOR**

VHB Project #: 63308.01

AM Peak Hour

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM - 7:15 AM	0	0	1	0	0	3	0	0	7	0	0	2
7:15 AM - 7:30 AM	0	0	1	0	0	6	0	0	20	0	0	4
7:30 AM - 7:45 AM	0	0	0	0	0	8	0	0	18	0	0	5
7:45 AM - 8:00 AM	0	0	0	0	0	1	0	0	19	0	0	8
8:00 AM - 8:15 AM	0	0	0	0	0	4	0	0	24	0	0	4
8:15 AM - 8:30 AM	0	0	0	0	0	10	0	0	16	0	0	4
8:30 AM - 8:45 AM	0	0	0	0	0	5	0	0	14	0	0	2
8:45 AM - 9:00 AM	0	0	0	0	0	3	0	0	13	0	0	7
TOTAL	0	0	2	0	0	40	0	0	131	0	0	36
Peak Hour												
7:15 AM - 8:15 AM	**0**	**0**	**1**	**0**	**0**	**19**	**0**	**0**	**81**	**0**	**0**	**21**

Mid-day

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
12:00 PM - 12:15 PM	0	0	0	0	0	7	0	0	21	0	0	1
12:15 PM - 12:30 PM	0	0	0	0	0	5	0	0	16	0	0	1
12:30 PM - 12:45 PM	0	0	0	0	0	5	0	0	11	0	0	3
12:45 PM - 1:00 PM	0	0	2	0	0	1	0	0	20	0	0	4
1:00 PM - 1:15 PM	0	0	2	0	0	3	0	0	13	0	0	1
1:15 PM - 1:30 PM	0	0	2	0	0	2	0	0	16	0	0	2
1:30 PM - 1:45 PM	0	0	0	0	0	7	0	0	15	0	0	2
1:45 PM - 2:00 PM	0	0	7	0	0	8	0	0	8	0	0	2
TOTAL	0	0	13	0	0	38	0	0	120	0	0	16
Peak Hour												
12:00 PM - 1:00 PM	**0**	**0**	**2**	**0**	**0**	**18**	**0**	**0**	**68**	**0**	**0**	**9**

PM Peak Hour

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2:00 PM - 2:15 PM	1	0	1	0	0	5	0	0	13	0	0	3
2:15 PM - 2:30 PM	0	0	1	0	0	6	0	0	20	0	0	3
2:30 PM - 2:45 PM	0	0	0	0	0	2	0	0	20	0	0	3
2:45 PM - 3:00 PM	0	0	2	0	0	4	0	0	20	0	0	5
3:00 PM - 3:15 PM	0	0	0	0	0	5	0	0	16	0	0	7
3:15 PM - 3:30 PM	0	0	1	0	0	6	0	0	15	0	0	6
3:30 PM - 3:45 PM	0	0	0	0	0	9	0	0	28	0	0	1
3:45 PM - 4:00 PM	0	0	2	0	0	4	0	0	26	0	0	1
4:00 PM - 4:15 PM	0	0	3	0	0	3	0	0	25	0	0	7
4:15 PM - 4:30 PM	0	0	0	0	0	7	0	0	14	0	0	1
4:30 PM - 4:45 PM	0	0	1	0	0	3	0	0	26	0	0	3
4:45 PM - 5:00 PM	0	0	1	1	0	10	0	0	23	0	0	3
5:00 PM - 5:15 PM	0	0	4	0	0	1	0	0	32	0	0	3
5:15 PM - 5:30 PM	0	0	0	0	0	1	0	0	40	0	0	1
5:30 PM - 5:45 PM	0	0	0	0	0	3	0	0	24	0	0	1
5:45 PM - 6:00 PM	0	0	2	1	0	7	0	0	30	0	0	2
TOTAL	1	0	18	2	0	76	0	0	372	0	0	50
Peak Hour												
4:30 PM - 5:30 PM	**0**	**0**	**6**	**1**	**0**	**15**	**0**	**0**	**121**	**0**	**0**	**10**

Pedestrian & Bicycle Summary

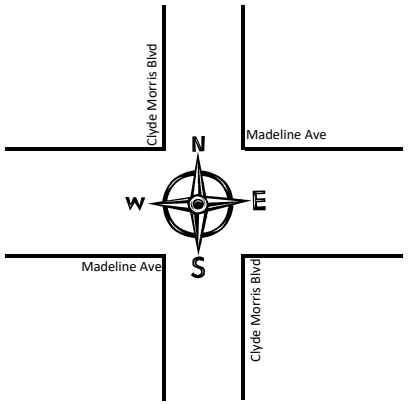
Project #: 63308.01 **NB/SB:** Clyde Morris Blvd

Date: 1/14/2020 **EB/WB:** Madeline Ave

Hour

		7:00	8:00	12:00	13:00	14:00	15:00	16:00	17:00	
		1	2	3	4	5	6	7	8	
Eastbound ▶	Bike	0	0	0	0	0	0	0	1	**1**
	Ped	0	0	0	0	0	0	3	0	**3**
Westbound ◀	Bike	0	0	0	0	0	0	0	0	**0**
	Ped	0	0	0	0	1	2	0	0	**3**

		Southbound		Northbound		
	Hour	Ped ▼	Bike	Ped ▲	Bike	
1	7:00	2	0	2	0	
2	8:00	2	0	1	0	
3	12:00	0	0	0	0	
4	13:00	0	0	1	0	
5	14:00	0	0	0	0	
6	15:00	5	2	0	0	
7	16:00	0	0	2	0	
8	17:00	1	0	1	0	
		10	**2**	**7**	**0**	



		Southbound		Northbound		
	Hour	Ped ▼	Bike	Ped ▲	Bike	
1	7:00	0	0	0	2	1
2	8:00	0	0	7	1	2
3	12:00	0	2	0	1	3
4	13:00	0	3	1	2	4
5	14:00	3	3	0	1	5
6	15:00	4	2	0	0	6
7	16:00	1	3	0	1	7
8	17:00	1	2	2	3	8
		9	**15**	**10**	**11**	

		7:00	8:00	12:00	13:00	14:00	15:00	16:00	17:00	
		1	2	3	4	5	6	7	8	
Eastbound ▶	Bike	0	1	3	0	0	1	1	1	**7**
	Ped	1	1	1	0	2	1	1	0	**7**
Westbound ◀	Bike	0	0	5	1	2	1	0	2	**11**
	Ped	0	1	1	0	0	1	1	1	**5**

Hour

54 **47**

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County Volusia **City** Port Orange

Intersection Clyde Morris Blvd **&** Willow Run Blvd

Date January 14, 2020 **All Vehicles**

VHB Project #: 63308.01

AM Peak Hour

Time Period	Clyde Morris Blvd Northbound			Clyde Morris Blvd Southbound			Willow Run Blvd Eastbound			Willow Run Blvd Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM - 7:15 AM	3	100	9	11	68	14	43	19	26	1	3	8
7:15 AM - 7:30 AM	13	117	12	34	108	49	53	63	26	1	3	10
7:30 AM - 7:45 AM	16	190	12	19	121	37	80	33	32	1	6	15
7:45 AM - 8:00 AM	16	200	14	12	135	28	84	46	23	7	8	14
8:00 AM - 8:15 AM	22	172	6	26	137	23	67	27	27	4	6	9
8:15 AM - 8:30 AM	17	138	10	13	121	37	63	36	27	7	10	17
8:30 AM - 8:45 AM	13	185	15	22	138	36	52	19	32	4	2	10
8:45 AM - 9:00 AM	14	160	16	27	137	35	56	43	26	5	13	20
TOTAL	114	1,262	94	164	965	259	498	286	219	30	51	103
Peak Hour												
7:30 AM - 8:30 AM	**71**	**700**	**42**	**70**	**514**	**125**	**294**	**142**	**109**	**19**	**30**	**55**

Mid-day Peak Hour

Time Period	Clyde Morris Blvd Northbound			Clyde Morris Blvd Southbound			Willow Run Blvd Eastbound			Willow Run Blvd Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
12:00 PM - 12:15 PM	19	129	13	22	166	50	42	20	12	19	12	20
12:15 PM - 12:30 PM	21	157	17	22	176	34	46	16	28	9	17	26
12:30 PM - 12:45 PM	15	138	11	20	145	39	35	23	28	5	13	24
12:45 PM - 1:00 PM	25	183	17	11	204	41	42	21	27	8	11	14
1:00 PM - 1:15 PM	24	135	8	31	144	44	33	16	27	9	14	20
1:15 PM - 1:30 PM	24	165	16	16	147	36	41	20	23	6	28	15
1:30 PM - 1:45 PM	15	162	7	17	156	39	41	14	30	14	9	23
1:45 PM - 2:00 PM	9	159	8	14	175	44	39	17	30	8	11	16
TOTAL	152	1,228	97	153	1,313	327	319	147	205	78	115	158
Peak Hour												
12:00 PM - 1:00 PM	**80**	**607**	**58**	**75**	**691**	**164**	**165**	**80**	**95**	**41**	**53**	**84**

PM Peak Hour

Time Period	Clyde Morris Blvd Northbound			Clyde Morris Blvd Southbound			Willow Run Blvd Eastbound			Willow Run Blvd Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2:00 PM - 2:15 PM	20	143	12	17	167	50	39	16	22	14	15	22
2:15 PM - 2:30 PM	29	168	13	30	193	34	33	34	17	11	10	23
2:30 PM - 2:45 PM	30	161	12	10	172	42	58	27	24	7	16	23
2:45 PM - 3:00 PM	25	191	5	18	134	36	50	8	19	8	22	26
3:00 PM - 3:15 PM	30	158	9	10	152	46	39	13	26	7	19	13
3:15 PM - 3:30 PM	21	165	11	19	152	46	42	24	34	13	18	18
3:30 PM - 3:45 PM	40	163	7	25	180	61	57	24	22	12	25	17
3:45 PM - 4:00 PM	36	189	13	24	206	68	49	23	30	6	8	11
4:00 PM - 4:15 PM	36	145	9	26	189	40	25	22	29	12	21	22
4:15 PM - 4:30 PM	28	140	16	24	178	50	49	34	30	17	46	56
4:30 PM - 4:45 PM	30	141	11	23	182	61	57	22	28	28	60	57
4:45 PM - 5:00 PM	22	188	6	25	205	66	44	24	25	7	30	15
5:00 PM - 5:15 PM	35	135	11	20	203	83	49	21	27	9	30	21
5:15 PM - 5:30 PM	31	125	19	30	207	74	52	35	47	10	29	22
5:30 PM - 5:45 PM	26	136	15	21	182	68	54	39	37	9	26	17
5:45 PM - 6:00 PM	34	141	11	18	159	48	43	24	35	10	20	18
TOTAL	473	2,489	180	340	2,861	873	740	390	452	180	395	381
Peak Hour												
4:30 PM - 5:30 PM	**118**	**589**	**47**	**98**	**797**	**284**	**202**	**102**	**127**	**54**	**149**	**115**

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County Volusia **City** Port Orange

Intersection Clyde Morris Blvd **&** Willow Run Blvd

Date January 14, 2020 **Trucks**

VHB Project #: 63308.01

AM Peak Hour

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM - 7:15 AM	0	2	0	0	7	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	1	2	0	0	4	2	1	0	0	0	0	0
7:30 AM - 7:45 AM	0	2	1	0	3	0	1	0	1	0	0	0
7:45 AM - 8:00 AM	0	4	0	0	6	0	1	0	0	0	0	0
8:00 AM - 8:15 AM	0	6	0	0	4	0	1	0	0	0	0	0
8:15 AM - 8:30 AM	0	3	0	0	5	0	1	0	0	0	0	0
8:30 AM - 8:45 AM	0	4	0	1	4	1	0	2	1	0	0	1
8:45 AM - 9:00 AM	1	5	0	0	1	0	2	0	0	1	0	1
TOTAL	2	28	1	1	34	3	7	2	2	1	0	2
Peak Hour												
7:30 AM - 8:30 AM	**0**	**15**	**1**	**0**	**18**	**0**	**4**	**0**	**1**	**0**	**0**	**0**
	0%	2%	2%	0%	4%	0%	1%	0%	1%	0%	0%	0%

Mid-day

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
12:00 PM - 12:15 PM	2	6	0	0	1	0	1	0	0	1	0	0
12:15 PM - 12:30 PM	0	1	0	0	2	1	3	0	0	0	0	0
12:30 PM - 12:45 PM	1	3	0	0	3	0	0	0	0	0	0	0
12:45 PM - 1:00 PM	0	0	0	0	1	2	2	1	1	0	0	0
1:00 PM - 1:15 PM	0	3	0	0	1	2	0	0	0	0	0	0
1:15 PM - 1:30 PM	1	4	2	0	5	0	0	0	0	0	1	0
1:30 PM - 1:45 PM	0	2	0	1	3	0	0	1	1	0	0	0
1:45 PM - 2:00 PM	2	6	0	0	5	1	0	0	0	0	1	0
TOTAL	6	25	2	1	21	6	6	2	2	1	2	0
Peak Hour												
12:00 PM - 1:00 PM	**3**	**10**	**0**	**0**	**7**	**3**	**6**	**1**	**1**	**1**	**0**	**0**
	4%	2%	0%	0%	1%	2%	4%	1%	1%	2%	0%	0%

PM Peak Hour

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2:00 PM - 2:15 PM	0	2	0	0	6	2	2	0	0	0	0	0
2:15 PM - 2:30 PM	1	1	1	0	5	0	1	0	0	0	0	0
2:30 PM - 2:45 PM	0	2	0	0	3	0	3	0	1	0	0	0
2:45 PM - 3:00 PM	0	6	0	1	3	1	2	0	0	0	0	1
3:00 PM - 3:15 PM	1	1	0	0	2	1	4	0	0	1	0	0
3:15 PM - 3:30 PM	0	2	0	0	3	1	1	1	0	2	0	0
3:30 PM - 3:45 PM	0	4	1	0	2	0	0	0	0	0	1	0
3:45 PM - 4:00 PM	0	2	0	0	3	1	1	0	0	0	0	0
4:00 PM - 4:15 PM	1	3	0	0	2	0	0	0	0	1	0	0
4:15 PM - 4:30 PM	0	3	1	0	1	2	1	0	0	0	0	1
4:30 PM - 4:45 PM	0	3	0	0	1	1	1	0	0	0	0	0
4:45 PM - 5:00 PM	1	4	0	0	3	1	2	1	0	0	0	0
5:00 PM - 5:15 PM	0	4	0	0	2	1	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	2	0	0	2	2	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	2	0	0	0	0	0	0	0	0	0	1
5:45 PM - 6:00 PM	0	3	0	0	2	1	0	0	0	0	0	0
TOTAL	4	44	3	1	40	14	18	2	1	4	1	3
Peak Hour												
4:30 PM - 5:30 PM	**1**	**13**	**0**	**0**	**8**	**5**	**3**	**1**	**0**	**0**	**0**	**0**
	1%	2%	0%	0%	1%	2%	1%	1%	0%	0%	0%	0%

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County Volusia **City** Port Orange

Intersection Clyde Morris Blvd **&** Willow Run Blvd

Date January 14, 2020 **U-Turns & RTOR**

VHB Project #: 63308.01

AM Peak Hour

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM - 7:15 AM	0	0	1	0	0	9	0	0	15	0	0	2
7:15 AM - 7:30 AM	0	0	2	0	0	12	0	0	14	0	0	5
7:30 AM - 7:45 AM	0	0	0	0	0	4	0	0	18	0	0	3
7:45 AM - 8:00 AM	0	0	1	0	0	5	0	0	15	0	0	3
8:00 AM - 8:15 AM	0	0	0	0	0	2	0	0	8	0	0	3
8:15 AM - 8:30 AM	0	0	0	0	0	4	0	0	6	0	0	5
8:30 AM - 8:45 AM	0	0	1	0	0	6	0	0	10	0	0	4
8:45 AM - 9:00 AM	0	0	2	0	0	6	0	0	8	0	0	11
TOTAL	0	0	7	0	0	48	0	0	94	0	0	36
Peak Hour												
7:00 AM - 8:00 AM	**0**	**0**	**4**	**0**	**0**	**30**	**0**	**0**	**62**	**0**	**0**	**13**

Mid-day

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
12:00 PM - 12:15 PM	0	0	1	0	0	7	0	0	3	0	0	9
12:15 PM - 12:30 PM	0	0	2	0	0	0	0	0	7	0	0	5
12:30 PM - 12:45 PM	0	0	0	0	0	0	0	0	10	0	0	6
12:45 PM - 1:00 PM	0	0	0	0	0	5	0	0	10	0	0	0
1:00 PM - 1:15 PM	0	0	0	0	0	4	0	0	10	0	0	6
1:15 PM - 1:30 PM	0	0	0	0	0	6	0	0	12	0	0	4
1:30 PM - 1:45 PM	0	0	2	0	0	2	0	0	17	0	0	4
1:45 PM - 2:00 PM	0	0	1	0	0	8	0	0	17	0	0	7
TOTAL	0	0	6	0	0	32	0	0	86	0	0	41
Peak Hour												
1:00 PM - 2:00 PM	**0**	**0**	**3**	**0**	**0**	**20**	**0**	**0**	**56**	**0**	**0**	**21**

PM Peak Hour

Time Period	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2:00 PM - 2:15 PM	0	0	0	0	0	6	0	0	9	0	0	11
2:15 PM - 2:30 PM	1	0	2	0	0	1	0	0	7	0	0	8
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	0	9	0	0	13
2:45 PM - 3:00 PM	0	0	0	0	0	1	0	0	11	0	0	11
3:00 PM - 3:15 PM	0	0	1	0	0	6	0	0	11	0	0	3
3:15 PM - 3:30 PM	0	0	0	0	0	5	0	0	15	0	0	8
3:30 PM - 3:45 PM	0	0	0	0	0	17	0	0	8	0	0	3
3:45 PM - 4:00 PM	0	0	1	0	0	5	0	0	17	0	0	1
4:00 PM - 4:15 PM	0	0	1	0	0	3	0	0	18	0	0	9
4:15 PM - 4:30 PM	0	0	4	0	0	9	0	0	19	0	0	20
4:30 PM - 4:45 PM	0	0	1	0	0	8	0	0	15	0	0	22
4:45 PM - 5:00 PM	0	0	0	0	0	19	0	0	16	0	0	2
5:00 PM - 5:15 PM	0	0	1	0	0	1	0	0	5	0	0	10
5:15 PM - 5:30 PM	0	0	1	0	0	5	0	0	32	0	0	11
5:30 PM - 5:45 PM	0	0	1	0	0	2	0	0	17	0	0	6
5:45 PM - 6:00 PM	0	0	2	0	0	6	0	0	26	0	0	6
TOTAL	1	0	15	0	0	94	0	0	235	0	0	144
Peak Hour												
4:00 PM - 5:00 PM	**0**	**0**	**6**	**0**	**0**	**39**	**0**	**0**	**68**	**0**	**0**	**53**

Pedestrian & Bicycle Summary

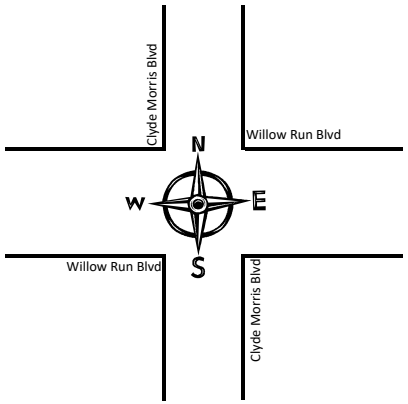
Project #: 63308.01 **NB/SB:** Clyde Morris Blvd

Date: 1/14/2020 **EB/WB:** Willow Run Blvd

Hour

		7:00	8:00	12:00	13:00	14:00	15:00	16:00	17:00	
		1	2	3	4	5	6	7	8	
Eastbound ▶	Bike	0	0	0	0	0	0	1	0	**1**
	Ped	1	1	0	0	4	0	1	0	**7**
Westbound ◀	Bike	0	0	0	0	0	0	2	0	**2**
	Ped	2	2	0	0	1	0	5	0	**10**

		Southbound		Northbound	
	Hour	Ped ▼	Bike	Ped ▲	Bike
1	7:00	0	0	0	0
2	8:00	1	2	0	0
3	12:00	0	0	0	0
4	13:00	0	0	3	0
5	14:00	0	0	0	0
6	15:00	0	0	1	0
7	16:00	0	0	0	0
8	17:00	0	0	0	0
		1	**2**	**4**	**0**



		Southbound		Northbound		
		Ped ▼	Bike	Ped ▲	Bike	Hour
1	7:00	0	0	0	0	7:00
2	8:00	3	0	4	0	8:00
3	12:00	1	1	1	1	12:00
4	13:00	0	0	0	0	13:00
5	14:00	0	1	0	0	14:00
6	15:00	0	0	0	0	15:00
7	16:00	1	3	1	0	16:00
8	17:00	0	0	2	0	17:00
		5	**5**	**8**	**1**	

		7:00	8:00	12:00	13:00	14:00	15:00	16:00	17:00	
		1	2	3	4	5	6	7	8	
Eastbound ▶	Bike	1	1	0	0	0	0	0	0	**2**
	Ped	0	1	0	0	0	0	0	0	**1**
Westbound ◀	Bike	0	0	1	0	0	0	0	0	**1**
	Ped	0	0	0	0	0	0	2	0	**2**

Hour

38 **14**

APPENDIX B:

Crash Data

Clyde Morris Boulevard at Reed Canal Road - Crash Data Summary (1/1/2017 - 12/31/2019)

No.	Crash ID	Date	Day	Time	Hour	Year	Crash Type	Crash Severity	Fatalities	Injuries	Property Damage	Day/Night	Wet/Dry
1	87510474	8/20/2018	Monday	6:36 PM	18	2018	Rear End	Property Damage Only	0	0	$1,100	Daylight	Dry
2	87510640	9/18/2018	Tuesday	4:02 PM	16	2018	Rear End	Property Damage Only	0	0	$7,500	Daylight	Wet
3	86752155	3/24/2018	Saturday	4:15 PM	16	2018	Left Turn	Injury	0	1	$900	Daylight	Dry
4	86751967	7/6/2017	Thursday	8:13 AM	08	2017	Pedestrian	Injury	0	1	$0	Daylight	Dry
5	87509804	2/7/2018	Wednesday	10:22 PM	22	2018	Rear End	Injury	0	2	$12,000	Dark - Lighted	Dry
6	86751729	4/25/2017	Tuesday	7:29 AM	07	2017	Rear End	Property Damage Only	0	0	$1,500	Daylight	Dry
7	87738569	11/5/2018	Monday	4:00 PM	16	2018	Sideswipe	Property Damage Only	0	0	$1,000	Daylight	Dry
8	87510013	8/26/2018	Sunday	9:21 PM	21	2018	Rear End	Injury	0	1	$10,000	Dark - Lighted	Dry
9	87738572	9/13/2018	Thursday	1:05 PM	13	2018	Unknown	Property Damage Only	0	0	$6,000	Daylight	Dry
10	86396187	3/18/2017	Saturday	4:00 PM	16	2017	Rear End	Property Damage Only	0	0	$1,200	Daylight	Dry
11	87738717	12/5/2018	Wednesday	2:43 PM	14	2018	Rear End	Injury	0	1	$15,000	Daylight	Dry
12	87509746	11/5/2017	Sunday	1:10 PM	13	2017	Rear End	Property Damage Only	0	0	$2,000	Daylight	Dry
13	86396284	9/5/2017	Tuesday	4:17 PM	16	2017	Rear End	Property Damage Only	0	0	$2,500	Daylight	Dry
14	87510405	5/21/2018	Monday	1:57 PM	13	2018	Unknown	Injury	0	1	$12,000	Daylight	Wet
15	87739993	8/1/2019	Thursday	4:18 PM	16	2019	Rear End	Property Damage Only	0	0	$5,000	Daylight	Dry
16	87740338	10/8/2019	Tuesday	8:39 AM	08	2019	Head On	Property Damage Only	0	0	$6,000	Daylight	Wet
17	87741415	11/28/2019	Thursday	8:37 PM	20	2019	Rear End	Injury	0	1	$12,000	Dark - Lighted	Dry
18	87510110	2/13/2018	Tuesday	10:45 AM	10	2018	Left Turn	Injury	0	1	$12,000	Daylight	Dry
19	87510291	4/2/2018	Monday	7:00 AM	07	2018	Left Turn	Property Damage Only	0	0	$27,500	Dawn	Dry
20	87739182	4/5/2019	Friday	4:02 PM	16	2019	Rear End	Injury	0	2	$15,000	Daylight	Dry
21	87510301	5/9/2018	Wednesday	11:40 AM	11	2018	Rear End	Injury	0	1	$20,000	Daylight	Dry
22	86752363	10/11/2017	Wednesday	1:59 PM	13	2017	Rear End	Property Damage Only	0	0	$5,000	Daylight	Dry
23	87739671	6/10/2019	Monday	4:25 PM	16	2019	Rear End	Property Damage Only	0	0	$3,500	Daylight	Dry
24	87738860	3/19/2019	Tuesday	8:50 AM	08	2019	Rear End	Property Damage Only	0	0	$3,000	Daylight	Wet
25	87739978	9/18/2019	Wednesday	2:02 PM	14	2019	Sideswipe	Property Damage Only	0	0	$3,000	Daylight	Dry
26	87510238	11/2/2018	Friday	6:00 PM	18	2018	Rear End	Property Damage Only	0	0	$2,000	Dusk	Wet
27	86396329	2/10/2017	Friday	8:12 AM	08	2017	Rear End	Property Damage Only	0	0	$1,500	Daylight	Dry
28	87739897	7/25/2019	Thursday	8:50 AM	08	2019	Bicycle	Injury	0	1	$0	Daylight	Wet
29	87510495	7/16/2018	Monday	8:55 AM	08	2018	Left Turn	Injury	0	1	$10,000	Daylight	Dry
30	86396619	6/13/2017	Tuesday	6:49 PM	18	2017	Left Turn	Injury	0	1	$4,000	Daylight	Wet
31	87509995	10/1/2018	Monday	9:53 PM	21	2018	Off Road	Property Damage Only	0	0	$3,000	Dark - Lighted	Wet
32	86395937	1/28/2018	Sunday	7:13 PM	19	2018	Unknown	Injury	0	1	$650	Dark - Lighted	Wet

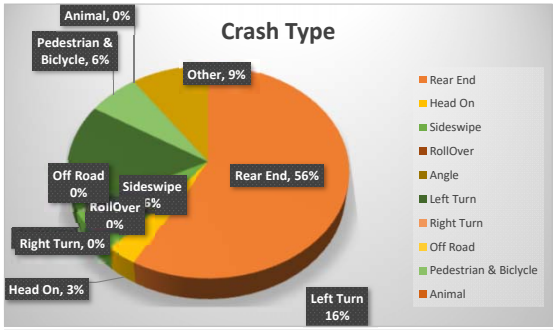
Clyde Morris Boulevard at Reed Canal Road - Crash Data Summary (1/1/2017 - 12/31/2019)

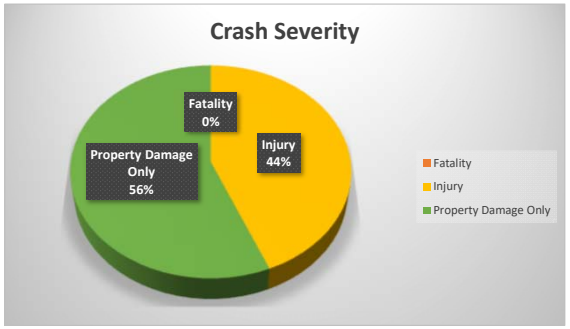
Crash Type	2017	2018	2019	Total	Proportion
Rear End	6	7	5	**18**	56%
Head On	0	0	1	**1**	3%
Sideswipe	0	1	1	**2**	6%
RollOver	0	0	0	**0**	0%
Angle	0	0	0	**0**	0%
Left Turn	1	4	0	**5**	16%
Right Turn	0	0	0	**0**	0%
Off Road	0	1	0	**1**	3%
Pedestrian & Biclycle	1	0	1	**2**	6%
Animal	0	0	0	**0**	0%
Other	0	3	0	**3**	9%
Total	**8**	**16**	**8**	**32**	100%

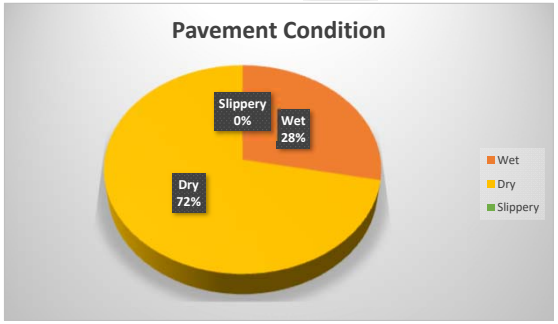
Crash Severity	2017	2018	2019	Total	Proportion
Fatality	0	0	0	**0**	0%
Injury	2	9	3	**14**	44%
Property Damage Only	6	7	5	**18**	56%
Total	**8**	**16**	**8**	**32**	100%

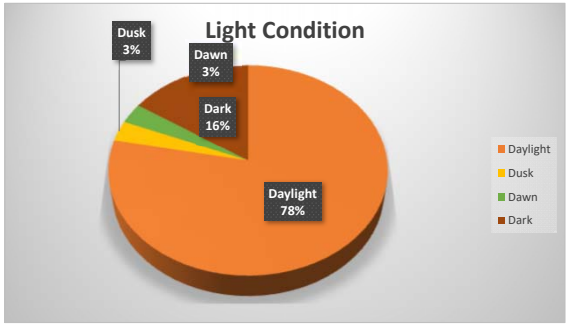
Pavement Condition	2017	2018	2019	Total	Proportion
Wet	1	5	3	**9**	28%
Dry	7	11	5	**23**	72%
Slippery	0	0	0	**0**	0%
Total	**8**	**16**	**8**	**32**	100%

Light Condition	2017	2018	2019	Total	Proportion
Daylight	8	10	7	**25**	78%
Dusk	0	1	0	**1**	3%
Dawn	0	1	0	**1**	3%
Dark	0	4	1	**5**	16%
Total	**8**	**16**	**8**	**32**	100%









Clyde Morris Boulevard at Madeline Avenue - Crash Data Summary (1/1/2017 - 12/31/2019)

No.	Crash ID	Date	Day	Time	Hour	Year	Crash Type	Crash Severity	Fatalities	Injuries	Property Damage	Day/Night	Wet/Dry
1	86752148	12/28/2017	Thursday	12:41 PM	12	2017	Rear End	Injury	0	2	$14,500	Daylight	Dry
2	87510293	3/26/2018	Monday	1:54 PM	13	2018	Rear End	Property Damage Only	0	0	$3,500	Daylight	Dry
3	86751952	11/20/2017	Monday	5:58 PM	17	2017	Rear End	Property Damage Only	0	0	$6,000	Dusk	Dry
4	86751591	6/20/2017	Tuesday	8:35 AM	08	2017	Rear End	Injury	0	3	$4,500	Daylight	Dry
5	87740189	10/27/2019	Sunday	8:57 PM	20	2019	Left Turn	Property Damage Only	0	0	$3,000	Dark - Lighted	Dry
6	86396572	3/6/2017	Monday	8:03 AM	08	2017	Left Turn	Injury	0	2	$10,000	Daylight	Dry
7	87738953	3/20/2019	Wednesday	9:04 PM	21	2019	Other	Injury	0	2	$14,000	Dark - Lighted	Dry
8	87739067	1/16/2019	Wednesday	2:32 PM	14	2019	Rear End	Injury	0	1	$11,000	Daylight	Dry
9	87740182	8/20/2019	Tuesday	12:53 PM	12	2019	Rear End	Injury	0	2	$30	Daylight	Dry
10	87510218	3/25/2018	Sunday	8:12 AM	08	2018	Rear End	Property Damage Only	0	0	$5,000	Daylight	Dry
11	87740469	12/3/2019	Tuesday	6:57 PM	18	2019	Rear End	Property Damage Only	0	0	$4,500	Dark - Lighted	Dry
12	86751482	3/20/2017	Monday	2:35 PM	14	2017	Rear End	Property Damage Only	0	0	$750	Daylight	Dry
13	86751581	6/15/2017	Thursday	7:57 PM	19	2017	Rear End	Injury	0	1	$1,000	Dawn	Wet
14	87510287	5/22/2018	Tuesday	9:44 AM	09	2018	Other	Property Damage Only	0	0	$2,500	Daylight	Dry
15	86396550	7/25/2017	Tuesday	7:08 PM	19	2017	Sideswipe	Property Damage Only	0	0	$6,500	Daylight	Dry
16	87739124	5/12/2019	Sunday	5:18 PM	17	2019	Rear End	Injury	0	1	$0	Daylight	Dry
17	86395936	7/29/2018	Sunday	1:01 PM	13	2018	Unknown	Injury	0	2	$12,000	Daylight	Dry
18	86396361	2/20/2017	Monday	4:26 PM	16	2017	Right Turn	Property Damage Only	0	0	$5,000	Daylight	Dry
19	87509818	11/28/2017	Tuesday	9:30 AM	09	2017	Rear End	Injury	0	1	$100	Daylight	Dry
20	87510546	12/17/2018	Monday	7:27 PM	19	2018	Rear End	Property Damage Only	0	0	$1,500	Dark - Lighted	Dry
21	87739957	7/11/2019	Thursday	10:29 AM	10	2019	Rear End	Injury	0	1	$2,000	Daylight	Dry
22	86751974	1/31/2018	Wednesday	5:43 PM	17	2018	Sideswipe	Property Damage Only	0	0	$2,500	Daylight	Dry
23	87739899	5/31/2019	Friday	10:26 AM	10	2019	Rear End	Injury	0	3	$14,000	Daylight	Dry
24	87738898	1/17/2019	Thursday	6:53 AM	06	2019	Rear End	Injury	0	1	$1,000	Dawn	Dry
25	86752051	10/16/2017	Monday	3:34 PM	15	2017	Rear End	Property Damage Only	0	0	$5,000	Daylight	Dry
26	87740479	10/23/2019	Wednesday	7:01 AM	07	2019	Rear End	Injury	0	1	$11,000	Dark - Not Lighted	Dry
27	86396371	7/22/2017	Saturday	11:21 AM	11	2017	Angle	Property Damage Only	0	0	$4,000	Daylight	Dry
28	86396448	12/23/2017	Saturday	6:30 PM	18	2017	Rear End	Property Damage Only	0	0	$2,000	Dusk	Dry
29	87739144	2/5/2019	Tuesday	2:55 PM	14	2019	Rear End	Property Damage Only	0	0	$8,000	Daylight	Dry
30	87739290	2/27/2019	Wednesday	9:48 AM	09	2019	Rear End	Injury	0	1	$6,000	Daylight	Dry
31	87740143	10/10/2019	Thursday	11:22 AM	11	2019	Left Turn	Injury	0	1	$6,500	Daylight	Dry
32	87510143	8/25/2018	Saturday	10:30 AM	10	2018	Rear End	Property Damage Only	0	0	$1,000	Daylight	Dry
33	86396211	5/13/2017	Saturday	3:03 PM	15	2017	Left Turn	Injury	0	6	$15,000	Daylight	Wet
34	87740496	12/4/2019	Wednesday	8:20 AM	08	2019	Rear End	Property Damage Only	0	0	$15,500	Daylight	Dry
35	87739796	8/25/2019	Sunday	5:10 PM	17	2019	Rear End	Property Damage Only	0	0	$4,500	Daylight	Dry
36	87739057	1/23/2019	Wednesday	2:19 PM	14	2019	Rear End	Property Damage Only	0	0	$2,000	Daylight	Dry
37	87510500	8/19/2018	Sunday	10:44 PM	22	2018	Rear End	Injury	0	1	$2,000	Dark - Lighted	Dry
38	87510450	7/14/2018	Saturday	3:33 PM	15	2018	Other	Property Damage Only	0	0	$2,800	Daylight	Dry
39	86396230	1/18/2017	Wednesday	5:08 PM	17	2017	Left Turn	Property Damage Only	0	0	$3,500	Daylight	Dry
40	87510432	12/17/2018	Monday	5:54 PM	17	2018	Rear End	Property Damage Only	0	0	$7,500	Dark - Lighted	Dry
41	86396300	1/27/2017	Friday	3:33 PM	15	2017	Rear End	Property Damage Only	0	0	$700	Daylight	Dry
42	87510098	1/30/2018	Tuesday	1:03 PM	13	2018	Rear End	Property Damage Only	0	0	$1,500	Daylight	Dry
43	87510193	3/8/2018	Thursday	3:55 PM	15	2018	Other	Injury	0	1	$500	Daylight	Dry
44	87739325	2/15/2019	Friday	4:14 PM	16	2019	Sideswipe	Property Damage Only	0	0	$3,000	Daylight	Dry
45	87509987	6/17/2018	Sunday	9:05 PM	21	2018	Other	Property Damage Only	0	0	$300	Dark - Lighted	Dry
46	87739681	10/20/2019	Sunday	8:34 PM	20	2019	Other	Injury	0	1	$4,000	Dark - Not Lighted	Dry
47	86752313	11/13/2017	Monday	6:10 PM	18	2017	Left Turn	Property Damage Only	0	0	$10,000	Dark - Lighted	Dry
48	86752362	10/10/2017	Tuesday	2:07 PM	14	2017	Unknown	Property Damage Only	0	0	$5,000	Daylight	Dry
49	86396246	1/26/2017	Thursday	4:38 PM	16	2017	Rear End	Injury	0	2	$15,000	Daylight	Dry
50	87738840	11/21/2018	Wednesday	3:27 PM	15	2018	Rear End	Injury	0	1	$2,500	Daylight	Dry
51	87740452	9/27/2019	Friday	8:50 PM	20	2019	Sideswipe	Injury	0	1	$2,000	Dark - Lighted	Dry
52	85812964	2/2/2018	Friday	12:40 AM	00	2018	Angle	Property Damage Only	0	0	$2,000	Dark - Not Lighted	Dry
53	87740247	9/13/2019	Friday	5:30 PM	17	2019	Rear End	Property Damage Only	0	0	$100	Daylight	Dry
54	87509853	12/13/2017	Wednesday	10:30 AM	10	2017	Off Road	Property Damage Only	0	0	$3,000	Daylight	Dry
55	87509786	10/19/2017	Thursday	4:27 PM	16	2017	Sideswipe	Injury	0	1	$1,500	Daylight	Dry
56	87739945	7/30/2019	Tuesday	3:27 PM	15	2019	Sideswipe	Property Damage Only	0	0	$6,000	Daylight	Dry
57	87739210	8/30/2019	Friday	3:34 PM	15	2019	Angle	Injury	0	3	$22,000	Daylight	Dry
58	87510428	8/5/2018	Sunday	6:28 PM	18	2018	Left Turn	Property Damage Only	0	0	$200	Daylight	Dry
59	87738463	9/7/2018	Friday	4:30 PM	16	2018	Left Turn	Property Damage Only	0	0	$20,000	Daylight	Dry
60	87740787	12/13/2019	Friday	4:21 PM	16	2019	Left Turn	Property Damage Only	0	0	$6,000	Daylight	Dry
61	86396186	2/23/2017	Thursday	4:18 PM	16	2017	Left Turn	Injury	0	2	$18,000	Daylight	Wet
62	87739510	4/9/2019	Tuesday	11:49 AM	11	2019	Rear End	Property Damage Only	0	0	$10,000	Daylight	Dry

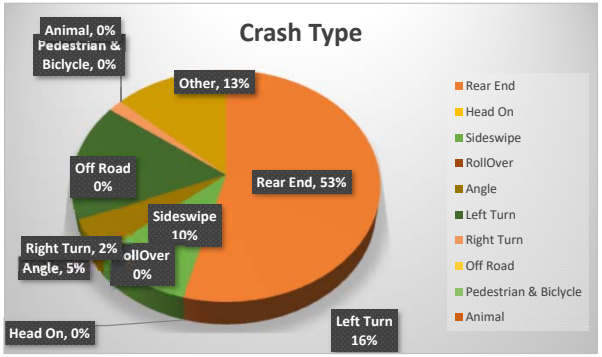
Clyde Morris Boulevard at Madeline Avenue - Crash Data Summary (1/1/2017 - 12/31/2019)

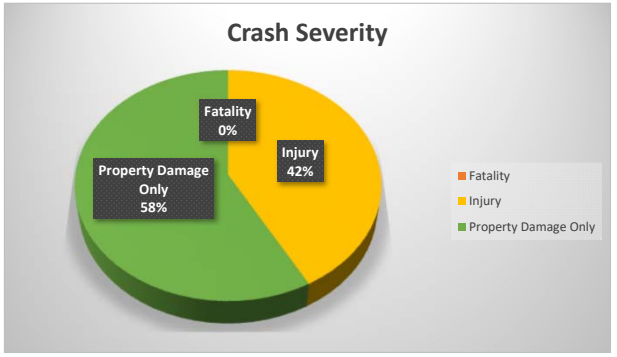
Crash Type	2017	2018	2019	Total	Proportion
Rear End	10	8	15	**33**	53%
Head On	0	0	0	**0**	0%
Sideswipe	2	1	3	**6**	10%
RollOver	0	0	0	**0**	0%
Angle	1	1	1	**3**	5%
Left Turn	5	2	3	**10**	16%
Right Turn	1	0	0	**1**	2%
Off Road	1	0	0	**1**	2%
Pedestrian & Biclycle	0	0	0	**0**	0%
Animal	0	0	0	**0**	0%
Other	1	5	2	**8**	13%
Total	**21**	**17**	**24**	**62**	100%

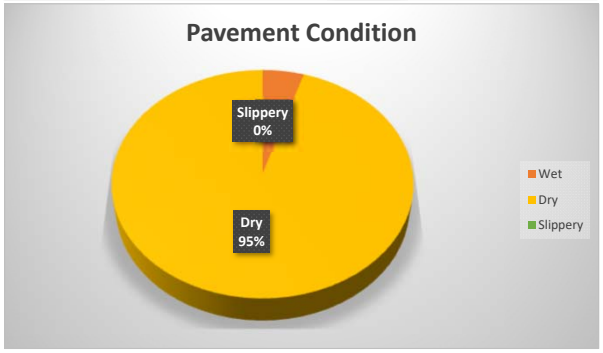
Crash Severity	2017	2018	2019	Total	Proportion
Fatality	0	0	0	**0**	0%
Injury	9	4	13	**26**	42%
Property Damage Only	12	13	11	**36**	58%
Total	**21**	**17**	**24**	**62**	100%

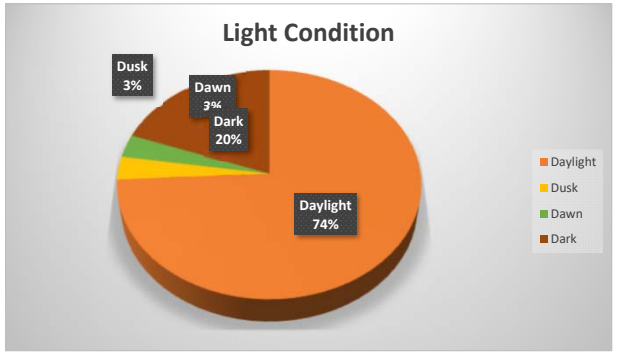
Pavement Condition	2017	2018	2019	Total	Proportion
Wet	3	0	0	**3**	5%
Dry	18	17	24	**59**	95%
Slippery	0	0	0	**0**	0%
Total	**21**	**17**	**24**	**62**	100%

Light Condition	2017	2018	2019	Total	Proportion
Daylight	17	12	17	**46**	74%
Dusk	2	0	0	**2**	3%
Dawn	1	0	1	**2**	3%
Dark	1	5	6	**12**	19%
Total	**21**	**17**	**24**	**62**	100%









Clyde Morris Boulevard at Willow Run Boulevard - Crash Data Summary (1/1/2017 - 12/31/2019)

No.	Crash ID	Date	Day	Time	Hour	Year	Crash Type	Crash Severity	Fatalities	Injuries	Property Damage	Day/Night	Wet/Dry
1	86751578	11/11/2017	Saturday	9:59 AM	09	2017	Other	Property Damage Only	0	0	$1,500	Daylight	Wet
2	87738696	11/27/2018	Tuesday	4:35 PM	16	2018	Rear End	Property Damage Only	0	0	$2,000	Daylight	Dry
3	87738536	6/11/2019	Tuesday	5:38 PM	17	2019	Rear End	Property Damage Only	0	0	$5,000	Daylight	Dry
4	86751964	9/18/2017	Monday	4:33 PM	16	2017	Rear End	Property Damage Only	0	0	$1,000	Daylight	Dry
5	87738526	9/13/2018	Thursday	12:50 PM	12	2018	Rear End	Injury	0	1	$1,000	Daylight	Dry
6	86752106	4/13/2019	Saturday	3:33 PM	15	2019	Bicycle	Property Damage Only	0	0	$1,500	Daylight	Dry
7	86395907	1/28/2017	Saturday	3:35 AM	03	2017	Off Road	Injury	0	2	$16,000	Dark - Not Lighted	Dry
8	86751532	9/9/2017	Saturday	9:27 AM	09	2017	Angle	Injury	0	2	$20,000	Daylight	Wet
9	86752005	10/30/2017	Monday	7:02 PM	19	2017	Rear End	Property Damage Only	0	0	$2,200	Dark - Lighted	Dry
10	86752145	11/13/2017	Monday	10:16 AM	10	2017	Left Turn	Injury	0	2	$15,000	Daylight	Dry
11	86751766	8/7/2017	Monday	8:40 PM	20	2017	Other	Property Damage Only	0	0	$900	Dark - Lighted	Dry
12	87738813	7/18/2019	Thursday	12:35 PM	12	2019	Unknown	Injury	0	3	$23,100	Daylight	Dry
13	87740511	11/7/2019	Thursday	4:57 PM	16	2019	Rear End	Property Damage Only	0	0	$1,600	Daylight	Dry
14	87739281	7/11/2019	Thursday	7:46 PM	19	2019	Off Road	Property Damage Only	0	0	$5,250	Dark - Lighted	Dry
15	87510587	11/13/2018	Tuesday	8:17 PM	20	2018	Rear End	Property Damage Only	0	0	$1,000	Dark - Lighted	Dry
16	87738960	12/11/2018	Tuesday	4:10 PM	16	2018	Unknown	Property Damage Only	0	0	$10,000	Daylight	Dry
17	87739934	7/25/2019	Thursday	9:41 AM	09	2019	Rear End	Injury	0	2	$1,500	Daylight	Wet
18	87509935	7/19/2018	Thursday	1:11 PM	13	2018	Rear End	Injury	0	1	$200	Daylight	Dry
19	86396380	4/19/2017	Wednesday	8:39 AM	08	2017	Left Turn	Property Damage Only	0	0	$6,000	Daylight	Dry
20	86751875	7/9/2017	Sunday	3:20 PM	15	2017	Left Turn	Property Damage Only	0	0	$2,500	Daylight	Dry
21	86751500	6/2/2017	Friday	3:40 PM	15	2017	Sideswipe	Property Damage Only	0	0	$1,000	Daylight	Dry
22	87739545	5/2/2019	Thursday	8:43 AM	08	2019	Rear End	Injury	0	1	$500	Daylight	Dry
23	87739730	5/7/2019	Tuesday	12:48 PM	12	2019	Rear End	Injury	0	1	$10,000	Daylight	Dry
24	87738474	10/12/2018	Friday	4:14 PM	16	2018	Rear End	Property Damage Only	0	0	$7,000	Daylight	Dry
25	87739994	8/5/2019	Monday	4:00 PM	16	2019	Rear End	Property Damage Only	0	0	$2,500	Daylight	Dry
26	87738975	12/21/2018	Friday	1:13 PM	13	2018	Angle	Injury	0	2	$25,000	Daylight	Dry
27	87510514	7/17/2018	Tuesday	8:49 AM	08	2018	Bicycle	Injury	0	0	$0	Daylight	Dry
28	87510252	12/8/2018	Saturday	10:37 PM	22	2018	Rear End	Property Damage Only	0	0	$500	Dark - Lighted	Dry
29	87509966	2/5/2018	Monday	2:22 PM	14	2018	Unknown	Property Damage Only	0	0	$10,000	Daylight	Dry
30	87510630	7/17/2018	Tuesday	12:55 PM	12	2018	Rear End	Property Damage Only	0	0	$750	Daylight	Dry
31	86396513	2/27/2017	Monday	11:16 AM	11	2017	Other	Property Damage Only	0	0	$7,500	Daylight	Dry
32	87739915	6/28/2019	Friday	11:08 AM	11	2019	Rear End	Property Damage Only	0	0	$5,000	Daylight	Dry
33	87740148	8/19/2019	Monday	10:22 AM	10	2019	Rear End	Property Damage Only	0	0	$4,000	Daylight	Dry
34	87739512	4/22/2019	Monday	8:09 AM	08	2019	Rear End	Property Damage Only	0	0	$5,500	Daylight	Dry
35	86751595	3/15/2017	Wednesday	5:19 PM	17	2017	Other	Property Damage Only	0	0	$2,000	Daylight	Dry
36	86751431	7/19/2017	Wednesday	9:25 PM	21	2017	Off Road	Property Damage Only	0	0	$1,000	Dark - Lighted	Dry

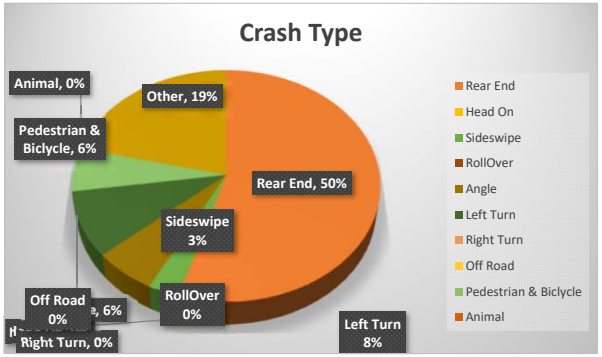
Clyde Morris Boulevard at Willow Run Boulevard - Crash Data Summary (1/1/2017 - 12/31/2019)

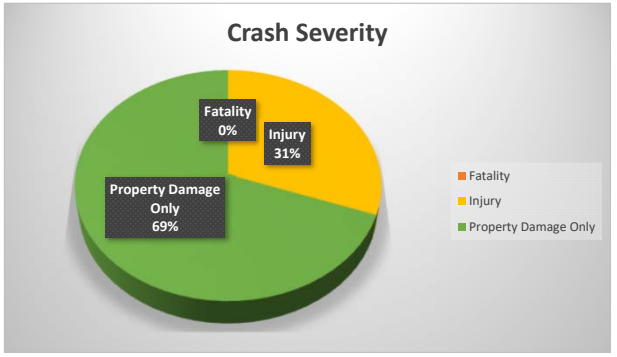
Crash Type	2017	2018	2019	Total	Proportion
Rear End	2	7	9	**18**	50%
Head On	0	0	0	**0**	0%
Sideswipe	1	0	0	**1**	3%
RollOver	0	0	0	**0**	0%
Angle	1	1	0	**2**	6%
Left Turn	3	0	0	**3**	8%
Right Turn	0	0	0	**0**	0%
Off Road	2	0	1	**3**	8%
Pedestrian & Biclycle	0	1	1	**2**	6%
Animal	0	0	0	**0**	0%
Other	4	2	1	**7**	19%
Total	**13**	**11**	**12**	**36**	100%

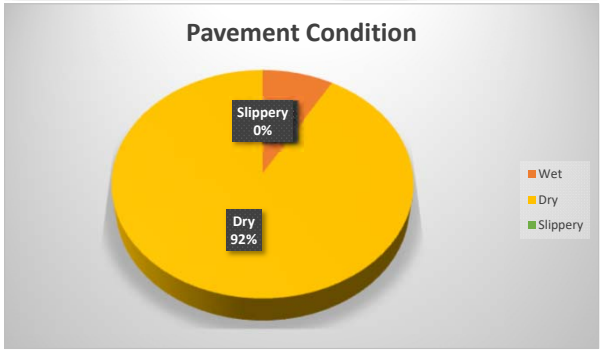
Crash Severity	2017	2018	2019	Total	Proportion
Fatality	0	0	0	**0**	0%
Injury	3	4	4	**11**	31%
Property Damage Only	10	7	8	**25**	69%
Total	**13**	**11**	**12**	**36**	100%

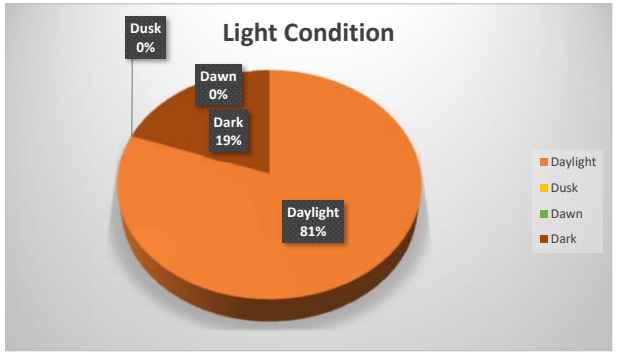
Pavement Condition	2017	2018	2019	Total	Proportion
Wet	2	0	1	**3**	8%
Dry	11	11	11	**33**	92%
Slippery	0	0	0	**0**	0%
Total	**13**	**11**	**12**	**36**	100%

Light Condition	2017	2018	2019	Total	Proportion
Daylight	9	9	11	**29**	81%
Dusk	0	0	0	**0**	0%
Dawn	0	0	0	**0**	0%
Dark	4	2	1	**7**	19%
Total	**13**	**11**	**12**	**36**	100%









APPENDIX C:

Traffic Operation Analysis
And
Signal Timing Sheets

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:45	6:45	6:45	6:45	6:45	6:45	6:45
End Time	8:00	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	7102	7243	7234	7049	6916	6992	7245
Vehs Exited	7143	7257	7217	7090	6933	7006	7221
Starting Vehs	206	176	165	162	179	161	145
Ending Vehs	165	162	182	121	162	147	169
Denied Entry Before	1	3	1	0	2	0	1
Denied Entry After	0	2	2	1	2	0	0
Travel Distance (mi)	3877	3941	3923	3840	3779	3817	3925
Travel Time (hr)	160.6	172.2	164.6	157.4	156.9	159.1	163.9
Total Delay (hr)	59.0	68.9	61.9	56.9	57.9	59.0	60.8
Total Stops	4663	5014	4765	4498	4538	4569	4779
Fuel Used (gal)	138.2	142.7	140.8	136.4	134.9	135.4	139.9

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:45	6:45	6:45	6:45
End Time	8:00	8:00	8:00	8:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	7245	7195	7064	7129
Vehs Exited	7257	7174	7068	7137
Starting Vehs	181	148	162	166
Ending Vehs	169	169	158	162
Denied Entry Before	2	1	2	0
Denied Entry After	1	2	1	0
Travel Distance (mi)	3926	3905	3845	3878
Travel Time (hr)	170.3	161.7	162.7	162.9
Total Delay (hr)	67.6	59.4	61.8	61.3
Total Stops	4943	4700	4769	4724
Fuel Used (gal)	141.8	139.1	138.4	138.8

Interval #0 Information Seeding

Start Time	6:45
End Time	7:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	7102	7243	7234	7049	6916	6992	7245
Vehs Exited	7143	7257	7217	7090	6933	7006	7221
Starting Vehs	206	176	165	162	179	161	145
Ending Vehs	165	162	182	121	162	147	169
Denied Entry Before	1	3	1	0	2	0	1
Denied Entry After	0	2	2	1	2	0	0
Travel Distance (mi)	3877	3941	3923	3840	3779	3817	3925
Travel Time (hr)	160.6	172.2	164.6	157.4	156.9	159.1	163.9
Total Delay (hr)	59.0	68.9	61.9	56.9	57.9	59.0	60.8
Total Stops	4663	5014	4765	4498	4538	4569	4779
Fuel Used (gal)	138.2	142.7	140.8	136.4	134.9	135.4	139.9

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	7245	7195	7064	7129
Vehs Exited	7257	7174	7068	7137
Starting Vehs	181	148	162	166
Ending Vehs	169	169	158	162
Denied Entry Before	2	1	2	0
Denied Entry After	1	2	1	0
Travel Distance (mi)	3926	3905	3845	3878
Travel Time (hr)	170.3	161.7	162.7	162.9
Total Delay (hr)	67.6	59.4	61.8	61.3
Total Stops	4943	4700	4769	4724
Fuel Used (gal)	141.8	139.1	138.4	138.8

3: Clyde Morris Blvd & Reed Canal Rd Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.2	0.1	0.2	0.4
Denied Del/Veh (s)	1.9	0.2	0.8	0.7
Total Delay (hr)	2.1	5.9	2.1	10.2
Total Del/Veh (s)	22.4	17.5	9.9	15.7
Stop Delay (hr)	1.7	3.2	1.3	6.3
Stop Del/Veh (s)	18.8	9.6	6.1	9.8
Total Stops	278	610	305	1193
Stop/Veh	0.81	0.50	0.38	0.50
Travel Dist (mi)	94.4	245.3	168.2	507.8
Travel Time (hr)	5.2	11.8	6.3	23.2
Avg Speed (mph)	19	21	28	22
Fuel Used (gal)	3.0	7.2	5.1	15.2
Fuel Eff. (mpg)	31.9	34.2	33.1	33.4
HC Emissions (g)	28	88	77	193
CO Emissions (g)	756	3695	2882	7333
NOx Emissions (g)	91	274	273	638
Vehicles Entered	330	1206	773	2309
Vehicles Exited	329	1209	773	2311
Hourly Exit Rate	329	1209	773	2311
Input Volume	326	1219	766	2311
% of Volume	101	99	101	100
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0
Density (ft/veh)	605	183	565	377
Occupancy (veh)	5	12	6	23

5: Clyde Morris Blvd & Madeline Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.3	0.2	0.1	0.1	0.7
Denied Del/Veh (s)	2.1	1.5	0.3	0.5	0.9
Total Delay (hr)	5.3	5.9	7.7	6.3	25.3
Total Del/Veh (s)	32.1	55.6	29.7	29.7	33.9
Stop Delay (hr)	4.4	5.1	5.6	4.8	19.9
Stop Del/Veh (s)	26.5	48.3	21.4	22.4	26.6
Total Stops	505	379	590	508	1982
Stop/Veh	0.84	0.99	0.63	0.66	0.74
Travel Dist (mi)	67.5	64.1	429.0	174.6	735.2
Travel Time (hr)	7.9	8.0	17.6	10.5	44.1
Avg Speed (mph)	9	8	24	17	17
Fuel Used (gal)	3.4	3.3	11.9	6.1	24.7
Fuel Eff. (mpg)	19.6	19.4	36.1	28.5	29.7
HC Emissions (g)	26	25	145	77	272
CO Emissions (g)	1161	1003	4014	3191	9368
NOx Emissions (g)	86	77	583	247	993
Vehicles Entered	590	373	914	756	2633
Vehicles Exited	589	371	922	761	2643
Hourly Exit Rate	589	371	922	761	2643
Input Volume	583	375	924	761	2643
% of Volume	101	99	100	100	100
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)	240	231	421	348	338
Occupancy (veh)	8	8	18	10	43

9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.1	0.1	0.1	0.1	0.4
Denied Del/Veh (s)	1.0	2.2	0.4	0.3	0.6
Total Delay (hr)	6.6	0.8	6.0	5.0	18.4
Total Del/Veh (s)	42.4	26.1	26.2	24.8	29.9
Stop Delay (hr)	5.8	0.7	4.3	3.6	14.5
Stop Del/Veh (s)	36.8	23.9	18.8	18.3	23.5
Total Stops	498	99	515	452	1564
Stop/Veh	0.88	0.88	0.62	0.63	0.70
Travel Dist (mi)	90.0	11.4	208.4	299.0	608.7
Travel Time (hr)	9.6	1.4	10.9	11.9	33.8
Avg Speed (mph)	9	9	19	25	18
Fuel Used (gal)	4.4	0.6	6.5	8.2	19.7
Fuel Eff. (mpg)	20.4	20.5	31.9	36.5	30.9
HC Emissions (g)	26	1	66	116	209
CO Emissions (g)	1431	88	2784	3214	7517
NOx Emissions (g)	92	8	242	443	784
Vehicles Entered	556	111	814	706	2187
Vehicles Exited	556	112	814	706	2188
Hourly Exit Rate	556	112	814	706	2188
Input Volume	545	104	813	709	2171
% of Volume	102	108	100	100	101
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)	269	818	374	566	429
Occupancy (veh)	9	1	11	12	33

Total Network Performance

Denied Delay (hr)	1.5
Denied Del/Veh (s)	0.7
Total Delay (hr)	59.8
Total Del/Veh (s)	29.5
Stop Delay (hr)	41.0
Stop Del/Veh (s)	20.2
Total Stops	4724
Stop/Veh	0.65
Travel Dist (mi)	3877.9
Travel Time (hr)	162.9
Avg Speed (mph)	24
Fuel Used (gal)	138.8
Fuel Eff. (mpg)	27.9
HC Emissions (g)	1712
CO Emissions (g)	64585
NOx Emissions (g)	6325
Vehicles Entered	7129
Vehicles Exited	7137
Hourly Exit Rate	7137
Input Volume	14250
% of Volume	50
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	233
Occupancy (veh)	161

Intersection: 3: Clyde Morris Blvd & Reed Canal Rd

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	T	TR	L	T	T
Maximum Queue (ft)	147	205	306	317	134	156	133
Average Queue (ft)	94	64	176	170	70	67	48
95th Queue (ft)	145	142	268	278	115	126	103
Link Distance (ft)		1510	1073	1073		1147	1147
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	100				100		
Storage Blk Time (%)	13	0			3	2	
Queuing Penalty (veh)	19	0			8	3	

Intersection: 5: Clyde Morris Blvd & Madeline Ave

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	160	409	80	200	454	180	312	314	149	303	285
Average Queue (ft)	140	177	39	96	212	64	172	179	44	175	161
95th Queue (ft)	184	357	69	196	422	138	268	274	109	265	250
Link Distance (ft)		603	603		906		2460	2460		1214	1214
Upstream Blk Time (%)		0									
Queuing Penalty (veh)		0									
Storage Bay Dist (ft)	110			150		200			200		
Storage Blk Time (%)	27	6		0	24	0	4			5	
Queuing Penalty (veh)	38	21		0	27	0	5			4	

Intersection: 9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	376	189	72	114	51	157	280	275	94	236	249
Average Queue (ft)	206	85	32	42	22	46	170	155	40	136	140
95th Queue (ft)	340	152	58	85	44	106	256	247	76	214	225
Link Distance (ft)	852	852		530			1348	1348		2235	2235
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			220		100	210			240		
Storage Blk Time (%)		0		1		0	3			0	
Queuing Penalty (veh)		0		0		0	2			0	

Network Summary

Network wide Queuing Penalty: 129

Intersection: 3: Clyde Morris Blvd & Reed Canal Rd

Phase	1	2	6	8
Movement(s) Served	SBL	NBT	SBTL	WBL
Maximum Green (s)	12.0	42.0	63.0	28.0
Minimum Green (s)	5.0	15.0	15.0	10.0
Recall	None	Min	Min	None
Avg. Green (s)	8.8	40.1	55.2	14.6
g/C Ratio	-0.01	NA	-0.01	-0.01
Cycles Skipped (%)	23	0	2	2
Cycles @ Minimum (%)	0	0	0	23
Cycles Maxed Out (%)	16	74	16	2
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 5: Clyde Morris Blvd & Madeline Ave

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Maximum Green (s)	22.5	42.5	23.0	23.0	22.5	42.5	23.0	23.0
Minimum Green (s)	5.0	15.0	5.0	7.0	5.0	15.0	5.0	7.0
Recall	None	Min	None	None	None	Min	None	None
Avg. Green (s)	9.3	44.0	20.0	20.8	11.4	39.5	12.7	31.3
g/C Ratio	-0.01	NA	NA	NA	-0.01	NA	-0.01	-0.01
Cycles Skipped (%)	27	0	0	0	13	0	7	3
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	0	63	43	57	0	40	3	77
Cycles with Peds (%)	0	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy

Phase	2	3	4	6	7	8
Movement(s) Served	WBTL	SBL	NBTL	EBTL	NBL	SBTL
Maximum Green (s)	21.0	11.0	41.0	21.0	11.0	41.0
Minimum Green (s)	10.0	5.0	15.0	10.0	5.0	15.0
Recall	None	None	Min	None	None	Min
Avg. Green (s)	11.8	7.4	38.8	19.8	7.7	37.7
g/C Ratio	-0.01	-0.01	NA	NA	-0.01	NA
Cycles Skipped (%)	18	36	0	0	32	0
Cycles @ Minimum (%)	50	0	0	0	0	0
Cycles Maxed Out (%)	0	3	44	71	3	38
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	11:45	11:45	11:45	11:45	11:45	11:45	11:45
End Time	1:00	1:00	1:00	1:00	1:00	1:00	1:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	6665	6647	6697	6549	6579	6515	6557
Vehs Exited	6670	6640	6703	6546	6573	6496	6545
Starting Vehs	154	169	130	124	136	146	131
Ending Vehs	149	176	124	127	142	165	143
Denied Entry Before	0	3	0	1	0	3	2
Denied Entry After	1	0	0	1	2	0	0
Travel Distance (mi)	3660	3652	3706	3607	3615	3580	3609
Travel Time (hr)	142.5	143.8	144.7	138.5	141.0	140.8	140.0
Total Delay (hr)	47.6	48.9	48.5	45.1	47.1	48.1	46.6
Total Stops	4028	4112	4105	3923	4002	3940	3982
Fuel Used (gal)	126.8	127.8	128.7	124.6	124.9	124.4	125.1

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	11:45	11:45	11:45	11:45
End Time	1:00	1:00	1:00	1:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	6674	6597	6705	6619
Vehs Exited	6663	6600	6695	6614
Starting Vehs	142	160	146	141
Ending Vehs	153	157	156	149
Denied Entry Before	1	0	3	0
Denied Entry After	1	0	1	0
Travel Distance (mi)	3701	3639	3701	3647
Travel Time (hr)	143.8	141.8	144.0	142.1
Total Delay (hr)	48.2	47.6	47.9	47.6
Total Stops	4088	4092	4146	4039
Fuel Used (gal)	128.5	126.6	128.8	126.6

Interval #0 Information Seeding

Start Time	11:45
End Time	12:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	12:00
End Time	1:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	6665	6647	6697	6549	6579	6515	6557
Vehs Exited	6670	6640	6703	6546	6573	6496	6545
Starting Vehs	154	169	130	124	136	146	131
Ending Vehs	149	176	124	127	142	165	143
Denied Entry Before	0	3	0	1	0	3	2
Denied Entry After	1	0	0	1	2	0	0
Travel Distance (mi)	3660	3652	3706	3607	3615	3580	3609
Travel Time (hr)	142.5	143.8	144.7	138.5	141.0	140.8	140.0
Total Delay (hr)	47.6	48.9	48.5	45.1	47.1	48.1	46.6
Total Stops	4028	4112	4105	3923	4002	3940	3982
Fuel Used (gal)	126.8	127.8	128.7	124.6	124.9	124.4	125.1

Interval #1 Information Recording

Start Time	12:00
End Time	1:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	6674	6597	6705	6619
Vehs Exited	6663	6600	6695	6614
Starting Vehs	142	160	146	141
Ending Vehs	153	157	156	149
Denied Entry Before	1	0	3	0
Denied Entry After	1	0	1	0
Travel Distance (mi)	3701	3639	3701	3647
Travel Time (hr)	143.8	141.8	144.0	142.1
Total Delay (hr)	48.2	47.6	47.9	47.6
Total Stops	4088	4092	4146	4039
Fuel Used (gal)	128.5	126.6	128.8	126.6

3: Clyde Morris Blvd & Reed Canal Rd Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.2	0.0	0.1	0.3
Denied Del/Veh (s)	2.2	0.2	0.5	0.6
Total Delay (hr)	1.6	2.9	2.1	6.6
Total Del/Veh (s)	19.8	12.4	8.0	11.6
Stop Delay (hr)	1.4	1.5	0.9	3.9
Stop Del/Veh (s)	16.5	6.7	4.0	7.0
Total Stops	234	352	281	867
Stop/Veh	0.78	0.42	0.33	0.44
Travel Dist (mi)	84.3	167.5	183.7	435.6
Travel Time (hr)	4.4	6.8	6.2	17.4
Avg Speed (mph)	20	25	30	25
Fuel Used (gal)	2.6	4.9	5.2	12.8
Fuel Eff. (mpg)	31.9	34.2	35.1	34.1
HC Emissions (g)	17	46	63	125
CO Emissions (g)	552	2517	2565	5634
NOx Emissions (g)	60	169	244	473
Vehicles Entered	294	824	844	1962
Vehicles Exited	296	821	844	1961
Hourly Exit Rate	296	821	844	1961
Input Volume	299	820	856	1975
% of Volume	99	100	99	99
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0
Density (ft/veh)	709	319	564	504
Occupancy (veh)	4	7	6	17

5: Clyde Morris Blvd & Madeline Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.2	0.2	0.1	0.1	0.5
Denied Del/Veh (s)	1.5	1.7	0.3	0.5	0.8
Total Delay (hr)	3.6	3.1	5.8	6.0	18.6
Total Del/Veh (s)	29.6	33.1	26.3	23.2	26.7
Stop Delay (hr)	3.0	2.6	4.2	4.2	14.1
Stop Del/Veh (s)	24.6	28.0	18.9	16.4	20.2
Total Stops	355	280	504	564	1703
Stop/Veh	0.80	0.82	0.63	0.60	0.68
Travel Dist (mi)	50.0	57.7	364.7	212.6	685.1
Travel Time (hr)	5.4	5.1	14.2	11.2	35.9
Avg Speed (mph)	10	12	26	19	19
Fuel Used (gal)	2.5	2.4	10.0	6.8	21.8
Fuel Eff. (mpg)	20.2	23.6	36.5	31.1	31.5
HC Emissions (g)	24	21	118	75	239
CO Emissions (g)	984	849	3382	3333	8548
NOx Emissions (g)	76	66	492	260	894
Vehicles Entered	438	335	778	923	2474
Vehicles Exited	436	335	782	923	2476
Hourly Exit Rate	436	335	782	923	2476
Input Volume	442	325	772	927	2466
% of Volume	99	103	101	100	100
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)	345	369	522	329	414
Occupancy (veh)	5	5	14	11	35

9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.1	0.1	0.1	0.1	0.4
Denied Del/Veh (s)	1.2	2.0	0.5	0.3	0.6
Total Delay (hr)	3.1	1.3	4.9	6.8	16.0
Total Del/Veh (s)	32.4	25.6	23.4	25.9	26.0
Stop Delay (hr)	2.7	1.1	3.5	4.7	12.1
Stop Del/Veh (s)	28.3	23.0	17.0	18.0	19.7
Total Stops	289	155	448	598	1490
Stop/Veh	0.81	0.84	0.60	0.63	0.66
Travel Dist (mi)	54.8	17.9	190.1	391.6	654.5
Travel Time (hr)	4.9	2.1	9.4	15.9	32.3
Avg Speed (mph)	11	9	20	25	20
Fuel Used (gal)	2.5	0.9	5.9	10.6	19.9
Fuel Eff. (mpg)	22.2	20.1	32.0	37.0	32.9
HC Emissions (g)	31	4	66	84	185
CO Emissions (g)	1108	176	2726	2950	6961
NOx Emissions (g)	88	17	240	401	746
Vehicles Entered	337	177	743	926	2183
Vehicles Exited	338	176	743	926	2183
Hourly Exit Rate	338	176	743	926	2183
Input Volume	340	178	745	930	2193
% of Volume	99	99	100	100	100
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)	530	523	435	425	450
Occupancy (veh)	5	2	9	16	32

Total Network Performance

Denied Delay (hr)	1.3
Denied Del/Veh (s)	0.7
Total Delay (hr)	46.3
Total Del/Veh (s)	24.6
Stop Delay (hr)	30.3
Stop Del/Veh (s)	16.1
Total Stops	4039
Stop/Veh	0.60
Travel Dist (mi)	3646.9
Travel Time (hr)	142.1
Avg Speed (mph)	26
Fuel Used (gal)	126.6
Fuel Eff. (mpg)	28.8
HC Emissions (g)	1462
CO Emissions (g)	57597
NOx Emissions (g)	5591
Vehicles Entered	6619
Vehicles Exited	6614
Hourly Exit Rate	6614
Input Volume	13268
% of Volume	50
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	267
Occupancy (veh)	141

Intersection: 3: Clyde Morris Blvd & Reed Canal Rd

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	T	TR	L	T	T
Maximum Queue (ft)	144	129	210	178	87	151	126
Average Queue (ft)	89	43	117	86	40	76	57
95th Queue (ft)	138	98	186	161	72	130	107
Link Distance (ft)		1510	1073	1073		1147	1147
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	100				100		
Storage Blk Time (%)	10	0			0	3	
Queuing Penalty (veh)	10	0			1	2	

Intersection: 5: Clyde Morris Blvd & Madeline Ave

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	159	290	83	192	246	155	255	266	157	276	270
Average Queue (ft)	88	126	35	81	118	38	140	145	57	163	155
95th Queue (ft)	155	230	66	153	203	96	227	234	116	250	248
Link Distance (ft)		603	603		906		2460	2460		1214	1214
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	110			150		200			200		
Storage Blk Time (%)	5	12		1	5		1		0	3	
Queuing Penalty (veh)	9	19		1	6		1		0	4	

Intersection: 9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	222	120	70	155	107	130	257	239	136	284	310
Average Queue (ft)	109	51	29	64	29	47	146	128	43	174	185
95th Queue (ft)	192	97	57	119	63	94	223	211	97	259	279
Link Distance (ft)	852	852		530			1348	1348		2235	2235
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			220		100	210			240		
Storage Blk Time (%)				3	0		1			1	
Queuing Penalty (veh)				2	0		1			1	

Network Summary

Network wide Queuing Penalty: 59

Intersection: 3: Clyde Morris Blvd & Reed Canal Rd

Phase	1	2	6	8
Movement(s) Served	SBL	NBT	SBTL	WBL
Maximum Green (s)	12.0	42.0	63.0	28.0
Minimum Green (s)	5.0	15.0	15.0	10.0
Recall	None	Min	Min	None
Avg. Green (s)	7.4	33.7	43.5	13.7
g/C Ratio	-0.01	NA	-0.01	-0.01
Cycles Skipped (%)	53	0	2	2
Cycles @ Minimum (%)	2	0	0	27
Cycles Maxed Out (%)	0	25	4	0
Cycles with Peds (%)	0	0	0	0

Controller Summary
Average Cycle Length (s): NA
Number of Complete Cycles : 0

Intersection: 5: Clyde Morris Blvd & Madeline Ave

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Maximum Green (s)	22.5	42.5	23.0	23.0	22.5	42.5	23.0	23.0
Minimum Green (s)	5.0	15.0	5.0	7.0	5.0	15.0	5.0	7.0
Recall	None	Min	None	None	None	Min	None	None
Avg. Green (s)	10.2	38.0	12.9	20.5	8.7	42.1	11.4	20.9
g/C Ratio	-0.01	NA	-0.01	-0.01	-0.01	NA	-0.01	NA
Cycles Skipped (%)	20	0	9	6	37	0	9	0
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	0	35	9	32	0	53	0	35
Cycles with Peds (%)	0	0	0	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA
Number of Complete Cycles : 0

Intersection: 9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy

Phase	1	2	3	4	5	6
Movement(s) Served	NBL	SBTL	EBTL	WBTL	SBL	NBTL
Maximum Green (s)	11.0	41.0	21.5	22.0	11.0	41.0
Minimum Green (s)	5.0	15.0	10.0	10.0	5.0	15.0
Recall	None	Min	None	None	None	Min
Avg. Green (s)	7.9	39.6	15.7	13.5	7.6	41.3
g/C Ratio	-0.01	NA	NA	-0.01	-0.01	NA
Cycles Skipped (%)	27	0	0	9	38	0
Cycles @ Minimum (%)	0	0	12	29	0	0
Cycles Maxed Out (%)	6	56	18	6	6	50
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	4:45	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	8232	8568	8573	8430	8442	8351	8468
Vehs Exited	8258	8556	8576	8479	8467	8380	8451
Starting Vehs	216	215	212	224	221	214	194
Ending Vehs	190	227	209	175	196	185	211
Denied Entry Before	1	1	1	0	0	1	2
Denied Entry After	4	0	1	0	1	2	0
Travel Distance (mi)	4473	4626	4623	4563	4573	4520	4535
Travel Time (hr)	206.9	222.5	214.5	212.4	213.5	210.4	209.0
Total Delay (hr)	78.7	89.7	82.1	81.7	82.3	80.8	79.1
Total Stops	5580	6175	5839	5766	5668	5640	5644
Fuel Used (gal)	156.2	163.5	161.6	159.6	159.6	157.8	158.2

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	8496	8518	8487	8458
Vehs Exited	8537	8565	8536	8481
Starting Vehs	234	259	238	222
Ending Vehs	193	212	189	199
Denied Entry Before	1	1	0	0
Denied Entry After	0	0	1	0
Travel Distance (mi)	4583	4603	4595	4569
Travel Time (hr)	215.8	216.8	213.2	213.5
Total Delay (hr)	84.7	84.8	81.9	82.6
Total Stops	5848	5888	5825	5785
Fuel Used (gal)	161.4	161.8	160.8	160.1

Interval #0 Information Seeding

Start Time	4:45
End Time	5:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	5:00
End Time	6:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	8232	8568	8573	8430	8442	8351	8468
Vehs Exited	8258	8556	8576	8479	8467	8380	8451
Starting Vehs	216	215	212	224	221	214	194
Ending Vehs	190	227	209	175	196	185	211
Denied Entry Before	1	1	1	0	0	1	2
Denied Entry After	4	0	1	0	1	2	0
Travel Distance (mi)	4473	4626	4623	4563	4573	4520	4535
Travel Time (hr)	206.9	222.5	214.5	212.4	213.5	210.4	209.0
Total Delay (hr)	78.7	89.7	82.1	81.7	82.3	80.8	79.1
Total Stops	5580	6175	5839	5766	5668	5640	5644
Fuel Used (gal)	156.2	163.5	161.6	159.6	159.6	157.8	158.2

Interval #1 Information Recording

Start Time	5:00
End Time	6:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	8496	8518	8487	8458
Vehs Exited	8537	8565	8536	8481
Starting Vehs	234	259	238	222
Ending Vehs	193	212	189	199
Denied Entry Before	1	1	0	0
Denied Entry After	0	0	1	0
Travel Distance (mi)	4583	4603	4595	4569
Travel Time (hr)	215.8	216.8	213.2	213.5
Total Delay (hr)	84.7	84.8	81.9	82.6
Total Stops	5848	5888	5825	5785
Fuel Used (gal)	161.4	161.8	160.8	160.1

3: Clyde Morris Blvd & Reed Canal Rd Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.2	0.0	0.2	0.4
Denied Del/Veh (s)	1.9	0.2	0.5	0.6
Total Delay (hr)	2.9	4.0	3.8	10.7
Total Del/Veh (s)	27.7	15.1	10.7	14.7
Stop Delay (hr)	2.4	2.3	1.9	6.7
Stop Del/Veh (s)	23.5	8.7	5.3	9.1
Total Stops	307	401	454	1162
Stop/Veh	0.82	0.42	0.35	0.44
Travel Dist (mi)	104.1	191.6	280.8	576.5
Travel Time (hr)	6.7	8.4	10.5	25.7
Avg Speed (mph)	16	23	27	23
Fuel Used (gal)	3.5	5.7	7.9	17.1
Fuel Eff. (mpg)	29.4	33.8	35.6	33.7
HC Emissions (g)	28	65	69	162
CO Emissions (g)	642	2993	3231	6866
NOx Emissions (g)	80	218	290	587
Vehicles Entered	363	942	1290	2595
Vehicles Exited	366	941	1288	2595
Hourly Exit Rate	366	941	1288	2595
Input Volume	361	942	1271	2574
% of Volume	101	100	101	101
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0
Density (ft/veh)	464	255	334	341
Occupancy (veh)	7	8	10	25

5: Clyde Morris Blvd & Madeline Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.2	0.2	0.1	0.2	0.7
Denied Del/Veh (s)	1.3	1.6	0.4	0.6	0.8
Total Delay (hr)	6.7	5.6	8.2	13.8	34.3
Total Del/Veh (s)	37.9	49.2	31.7	39.4	38.1
Stop Delay (hr)	5.8	4.9	6.1	9.9	26.8
Stop Del/Veh (s)	32.9	43.4	23.6	28.4	29.8
Total Stops	567	379	620	968	2534
Stop/Veh	0.90	0.93	0.66	0.77	0.78
Travel Dist (mi)	71.2	68.6	432.3	287.4	859.5
Travel Time (hr)	9.4	8.2	18.3	20.9	56.8
Avg Speed (mph)	8	9	24	14	15
Fuel Used (gal)	3.9	3.4	12.2	9.9	29.3
Fuel Eff. (mpg)	18.4	20.5	35.5	28.9	29.3
HC Emissions (g)	20	18	118	67	224
CO Emissions (g)	907	656	3705	3554	8821
NOx Emissions (g)	74	60	516	240	891
Vehicles Entered	621	399	924	1247	3191
Vehicles Exited	623	401	916	1241	3181
Hourly Exit Rate	623	401	916	1241	3181
Input Volume	632	397	930	1250	3209
% of Volume	99	101	98	99	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)	196	227	405	176	261
Occupancy (veh)	9	8	18	21	56

9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.1	0.2	0.1	0.1	0.5
Denied Del/Veh (s)	1.3	1.7	0.6	0.4	0.7
Total Delay (hr)	4.7	3.2	6.5	14.0	28.4
Total Del/Veh (s)	39.0	36.4	30.5	42.0	37.6
Stop Delay (hr)	4.3	2.8	4.9	10.1	22.1
Stop Del/Veh (s)	35.2	31.4	23.3	30.3	29.3
Total Stops	365	287	503	934	2089
Stop/Veh	0.84	0.90	0.66	0.78	0.77
Travel Dist (mi)	69.1	31.9	193.3	498.5	792.8
Travel Time (hr)	7.3	4.5	11.1	25.7	48.6
Avg Speed (mph)	10	7	18	19	16
Fuel Used (gal)	3.2	1.9	6.3	14.5	25.9
Fuel Eff. (mpg)	21.3	17.0	30.7	34.5	30.6
HC Emissions (g)	17	7	63	116	203
CO Emissions (g)	715	447	2719	3847	7728
NOx Emissions (g)	58	33	227	502	820
Vehicles Entered	425	313	756	1178	2672
Vehicles Exited	428	314	754	1174	2670
Hourly Exit Rate	428	314	754	1174	2670
Input Volume	431	318	754	1179	2682
% of Volume	99	99	100	100	100
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)	356	243	368	262	299
Occupancy (veh)	7	4	11	26	48

Total Network Performance

Denied Delay (hr)	1.7
Denied Del/Veh (s)	0.7
Total Delay (hr)	80.9
Total Del/Veh (s)	33.5
Stop Delay (hr)	55.9
Stop Del/Veh (s)	23.2
Total Stops	5785
Stop/Veh	0.67
Travel Dist (mi)	4569.4
Travel Time (hr)	213.5
Avg Speed (mph)	22
Fuel Used (gal)	160.1
Fuel Eff. (mpg)	28.5
HC Emissions (g)	1437
CO Emissions (g)	54294
NOx Emissions (g)	5363
Vehicles Entered	8458
Vehicles Exited	8481
Hourly Exit Rate	8481
Input Volume	16930
% of Volume	50
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	178
Occupancy (veh)	212

Intersection: 3: Clyde Morris Blvd & Reed Canal Rd

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	R	T	TR	L	T	T
Maximum Queue (ft)	149	270	276	248	146	240	223
Average Queue (ft)	119	99	151	123	67	121	107
95th Queue (ft)	165	230	243	218	123	208	197
Link Distance (ft)		1510	1073	1073		1147	1147
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	100				100		
Storage Blk Time (%)	27	0			2	9	
Queuing Penalty (veh)	32	1			11	13	

Intersection: 5: Clyde Morris Blvd & Madeline Ave

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	160	456	136	200	415	238	289	294	250	490	475
Average Queue (ft)	124	210	59	121	204	88	168	177	140	298	303
95th Queue (ft)	188	384	105	222	353	172	256	263	287	447	435
Link Distance (ft)		603	603		906		2460	2460		1214	1214
Upstream Blk Time (%)		0									
Queuing Penalty (veh)		0									
Storage Bay Dist (ft)	110			150		200			200		
Storage Blk Time (%)	14	30		1	22	0	3		0	23	
Queuing Penalty (veh)	37	56		4	31	0	6		1	41	

Intersection: 9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	260	138	110	307	150	218	286	267	290	492	512
Average Queue (ft)	144	69	44	148	62	77	165	144	94	290	317
95th Queue (ft)	238	126	86	259	149	152	246	235	246	454	476
Link Distance (ft)	852	852		530			1348	1348		2235	2235
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			220		100	210			240		
Storage Blk Time (%)				23	0	0	3		0	17	
Queuing Penalty (veh)				26	0	0	3		0	16	

Network Summary

Network wide Queuing Penalty: 278

Intersection: 3: Clyde Morris Blvd & Reed Canal Rd

Phase	1	2	6	8
Movement(s) Served	SBL	NBT	SBTL	WBL
Maximum Green (s)	12.0	42.0	63.0	28.0
Minimum Green (s)	5.0	15.0	15.0	10.0
Recall	None	Max	Max	None
Avg. Green (s)	8.2	51.5	65.2	18.4
g/C Ratio	-0.01	NA	NA	NA
Cycles Skipped (%)	31	0	0	0
Cycles @ Minimum (%)	0	0	0	8
Cycles Maxed Out (%)	8	100	100	11
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 5: Clyde Morris Blvd & Madeline Ave

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Maximum Green (s)	22.5	42.5	23.0	23.0	22.5	42.5	23.0	23.0
Minimum Green (s)	5.0	15.0	5.0	7.0	5.0	15.0	5.0	7.0
Recall	None	Max	None	None	None	Max	None	None
Avg. Green (s)	13.7	46.8	14.5	24.3	13.7	46.3	12.7	25.8
g/C Ratio	-0.01	NA	NA	NA	-0.01	NA	-0.01	NA
Cycles Skipped (%)	7	0	0	0	4	0	4	0
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	4	100	4	71	4	100	4	76
Cycles with Peds (%)	0	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy

Phase	1	2	3	4	5	6
Movement(s) Served	NBL	SBTL	EBTL	WBTL	SBL	NBTL
Maximum Green (s)	11.0	41.0	21.5	22.0	11.0	41.0
Minimum Green (s)	5.0	15.0	10.0	10.0	5.0	15.0
Recall	None	Max	None	None	None	Max
Avg. Green (s)	9.1	45.1	18.7	19.3	8.2	46.4
g/C Ratio	-0.01	NA	NA	NA	-0.01	NA
Cycles Skipped (%)	14	0	0	0	14	0
Cycles @ Minimum (%)	0	0	3	0	0	0
Cycles Maxed Out (%)	31	100	41	48	11	100
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:45	6:45	6:45	6:45	6:45	6:45	6:45
End Time	8:00	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	7143	7271	7244	7089	7112	7015	7158
Vehs Exited	7150	7253	7246	7076	7102	7041	7161
Starting Vehs	172	159	175	148	188	165	145
Ending Vehs	165	177	173	161	198	139	142
Denied Entry Before	3	0	1	4	4	1	4
Denied Entry After	2	1	1	1	4	2	2
Travel Distance (mi)	3890	3927	3956	3846	3871	3823	3873
Travel Time (hr)	158.7	167.0	163.6	158.4	157.4	152.2	159.9
Total Delay (hr)	56.7	63.9	60.0	57.6	55.8	52.3	58.1
Total Stops	4606	4968	4810	4661	4567	4345	4743
Fuel Used (gal)	138.0	141.4	141.7	137.2	137.0	135.3	139.5

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:45	6:45	6:45	6:45
End Time	8:00	8:00	8:00	8:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	7200	7209	7123	7158
Vehs Exited	7239	7219	7118	7161
Starting Vehs	193	165	154	166
Ending Vehs	154	155	159	162
Denied Entry Before	0	1	3	0
Denied Entry After	2	0	3	0
Travel Distance (mi)	3923	3907	3890	3891
Travel Time (hr)	163.7	161.3	160.4	160.3
Total Delay (hr)	60.8	58.5	58.7	58.2
Total Stops	4801	4757	4698	4694
Fuel Used (gal)	140.1	140.0	139.4	139.0

Interval #0 Information Seeding

Start Time	6:45
End Time	7:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	7143	7271	7244	7089	7112	7015	7158
Vehs Exited	7150	7253	7246	7076	7102	7041	7161
Starting Vehs	172	159	175	148	188	165	145
Ending Vehs	165	177	173	161	198	139	142
Denied Entry Before	3	0	1	4	4	1	4
Denied Entry After	2	1	1	1	4	2	2
Travel Distance (mi)	3890	3927	3956	3846	3871	3823	3873
Travel Time (hr)	158.7	167.0	163.6	158.4	157.4	152.2	159.9
Total Delay (hr)	56.7	63.9	60.0	57.6	55.8	52.3	58.1
Total Stops	4606	4968	4810	4661	4567	4345	4743
Fuel Used (gal)	138.0	141.4	141.7	137.2	137.0	135.3	139.5

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	7200	7209	7123	7158
Vehs Exited	7239	7219	7118	7161
Starting Vehs	193	165	154	166
Ending Vehs	154	155	159	162
Denied Entry Before	0	1	3	0
Denied Entry After	2	0	3	0
Travel Distance (mi)	3923	3907	3890	3891
Travel Time (hr)	163.7	161.3	160.4	160.3
Total Delay (hr)	60.8	58.5	58.7	58.2
Total Stops	4801	4757	4698	4694
Fuel Used (gal)	140.1	140.0	139.4	139.0

3: Clyde Morris Blvd & Reed Canal Rd Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.2	0.3	0.2	0.6
Denied Del/Veh (s)	1.9	0.8	0.8	1.0
Total Delay (hr)	2.2	5.5	2.2	9.8
Total Del/Veh (s)	22.9	16.0	10.2	15.1
Stop Delay (hr)	1.9	2.9	1.4	6.2
Stop Del/Veh (s)	19.4	8.6	6.4	9.5
Total Stops	271	607	300	1178
Stop/Veh	0.81	0.50	0.39	0.51
Travel Dist (mi)	96.9	246.7	166.9	510.5
Travel Time (hr)	5.4	11.6	6.3	23.3
Avg Speed (mph)	19	22	27	23
Fuel Used (gal)	3.0	7.1	5.1	15.1
Fuel Eff. (mpg)	31.5	32.5	33.0	32.5
HC Emissions (g)	28	98	81	207
CO Emissions (g)	769	4220	2951	7939
NOx Emissions (g)	90	311	280	681
Vehicles Entered	339	1213	769	2321
Vehicles Exited	340	1212	767	2319
Hourly Exit Rate	340	1212	767	2319
Input Volume	326	1219	766	2311
% of Volume	104	99	100	100
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0
Density (ft/veh)	575	285	562	427
Occupancy (veh)	5	11	6	23

5: Clyde Morris Blvd & Madeline Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.3	0.1	0.1	0.2	0.8
Denied Del/Veh (s)	2.1	1.4	0.4	0.9	1.1
Total Delay (hr)	5.2	5.2	7.7	6.2	24.4
Total Del/Veh (s)	31.4	50.4	29.7	28.5	32.6
Stop Delay (hr)	4.3	4.5	5.6	4.6	19.1
Stop Del/Veh (s)	26.0	43.5	21.4	21.3	25.5
Total Stops	494	360	610	504	1968
Stop/Veh	0.82	0.96	0.65	0.69	0.74
Travel Dist (mi)	67.3	62.9	432.7	178.3	741.2
Travel Time (hr)	7.8	7.3	17.7	10.6	43.4
Avg Speed (mph)	9	9	25	17	17
Fuel Used (gal)	3.4	3.1	11.8	6.3	24.6
Fuel Eff. (mpg)	19.7	20.2	36.1	28.3	29.9
HC Emissions (g)	24	22	136	81	263
CO Emissions (g)	1135	969	3899	3407	9410
NOx Emissions (g)	81	70	562	259	972
Vehicles Entered	593	368	923	773	2657
Vehicles Exited	590	365	925	774	2654
Hourly Exit Rate	590	365	925	774	2654
Input Volume	583	375	924	761	2643
% of Volume	101	97	100	102	100
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)	240	250	558	466	428
Occupancy (veh)	7	7	18	10	43

9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.1	0.1	0.1	0.1	0.4
Denied Del/Veh (s)	0.9	2.2	0.4	0.6	0.7
Total Delay (hr)	5.5	0.7	5.7	4.1	16.0
Total Del/Veh (s)	35.7	25.6	24.6	20.4	26.1
Stop Delay (hr)	4.7	0.6	4.0	2.9	12.3
Stop Del/Veh (s)	30.4	23.4	17.3	14.4	20.0
Total Stops	466	86	509	432	1493
Stop/Veh	0.84	0.87	0.61	0.60	0.67
Travel Dist (mi)	87.8	10.0	211.2	299.5	608.6
Travel Time (hr)	8.4	1.2	10.7	11.1	31.4
Avg Speed (mph)	11	9	20	27	20
Fuel Used (gal)	4.1	0.5	6.5	8.1	19.2
Fuel Eff. (mpg)	21.6	20.6	32.4	36.8	31.7
HC Emissions (g)	27	1	69	119	217
CO Emissions (g)	1435	74	2824	3343	7676
NOx Emissions (g)	93	7	252	456	808
Vehicles Entered	549	98	825	708	2180
Vehicles Exited	549	99	826	708	2182
Hourly Exit Rate	549	99	826	708	2182
Input Volume	545	104	813	709	2171
% of Volume	101	95	102	100	101
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)	303	943	382	813	534
Occupancy (veh)	8	1	11	11	31

Total Network Performance

Denied Delay (hr)	1.9
Denied Del/Veh (s)	0.9
Total Delay (hr)	56.4
Total Del/Veh (s)	27.7
Stop Delay (hr)	37.8
Stop Del/Veh (s)	18.6
Total Stops	4694
Stop/Veh	0.64
Travel Dist (mi)	3890.7
Travel Time (hr)	160.3
Avg Speed (mph)	25
Fuel Used (gal)	139.0
Fuel Eff. (mpg)	28.0
HC Emissions (g)	1731
CO Emissions (g)	65362
NOx Emissions (g)	6402
Vehicles Entered	7158
Vehicles Exited	7161
Hourly Exit Rate	7161
Input Volume	14250
% of Volume	50
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	281
Occupancy (veh)	158

Intersection: 3: Clyde Morris Blvd & Reed Canal Rd

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	147	213	269	258	125	133	171	128
Average Queue (ft)	92	61	170	136	76	71	68	49
95th Queue (ft)	145	150	257	235	140	120	132	105
Link Distance (ft)		1498	1073	1073			1147	1147
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100				100	100		
Storage Blk Time (%)	8	0		9	0	4	2	
Queuing Penalty (veh)	12	1		26	2	11	3	

Intersection: 5: Clyde Morris Blvd & Madeline Ave

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	T	R	L	T	T
Maximum Queue (ft)	160	386	72	200	375	211	288	290	125	178	286	279
Average Queue (ft)	138	172	32	87	189	64	168	176	32	45	168	150
95th Queue (ft)	186	337	59	192	341	134	257	264	112	105	254	240
Link Distance (ft)		594	594		896		2460	2460			1214	1214
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	110			150		200			100	200		
Storage Blk Time (%)	28	6		0	23	0	4	30	0		4	16
Queuing Penalty (veh)	40	20		1	26	0	5	13	0		3	19

Intersection: 5: Clyde Morris Blvd & Madeline Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	125
Average Queue (ft)	64
95th Queue (ft)	139
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	LT	R	L	T	TR	L	T	T	R
Maximum Queue (ft)	330	169	66	88	58	146	275	256	87	208	219	125
Average Queue (ft)	180	80	29	35	21	42	164	147	39	117	108	55
95th Queue (ft)	294	143	52	72	45	97	253	238	75	185	191	124
Link Distance (ft)	839	839		530			1348	1348		2234	2234	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			220		100	210			240			100
Storage Blk Time (%)		0		0			3			0	10	0
Queuing Penalty (veh)		0		0			2			0	12	0

Network Summary

Network wide Queuing Penalty: 196

Intersection: 3: Clyde Morris Blvd & Reed Canal Rd

Phase	1	2	6	8
Movement(s) Served	SBL	NBT	SBTL	WBL
Maximum Green (s)	12.0	42.0	63.0	28.0
Minimum Green (s)	5.0	15.0	15.0	10.0
Recall	None	Min	Min	None
Avg. Green (s)	9.0	39.4	54.9	15.5
g/C Ratio	-0.01	NA	-0.01	-0.01
Cycles Skipped (%)	21	0	2	2
Cycles @ Minimum (%)	0	0	0	21
Cycles Maxed Out (%)	19	67	16	2
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 5: Clyde Morris Blvd & Madeline Ave

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Maximum Green (s)	22.5	42.5	23.0	23.0	22.5	42.5	23.0	23.0
Minimum Green (s)	5.0	15.0	5.0	7.0	5.0	15.0	5.0	7.0
Recall	None	Min	None	None	None	Min	None	None
Avg. Green (s)	9.9	43.4	20.3	20.8	11.3	37.3	12.0	32.3
g/C Ratio	-0.01	NA	NA	NA	-0.01	NA	-0.01	-0.01
Cycles Skipped (%)	30	0	0	0	10	0	10	3
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	0	57	47	60	0	32	3	80
Cycles with Peds (%)	0	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy

Phase	1	2	3	4	5	6
Movement(s) Served	NBL	SBTL	EBTL	WBTL	SBL	NBTL
Maximum Green (s)	11.0	41.0	21.5	22.0	11.0	41.0
Minimum Green (s)	5.0	15.0	10.0	10.0	5.0	15.0
Recall	None	Min	None	None	None	Min
Avg. Green (s)	7.7	36.2	20.0	11.9	7.3	36.5
g/C Ratio	-0.01	NA	NA	-0.01	-0.01	NA
Cycles Skipped (%)	39	0	0	31	39	0
Cycles @ Minimum (%)	0	0	0	47	0	0
Cycles Maxed Out (%)	6	35	64	0	0	38
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	11:45	11:45	11:45	11:45	11:45	11:45	11:45
End Time	1:00	1:00	1:00	1:00	1:00	1:00	1:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	6585	6741	6718	6516	6482	6585	6620
Vehs Exited	6619	6715	6708	6544	6490	6570	6610
Starting Vehs	166	148	133	130	141	116	128
Ending Vehs	132	174	143	102	133	131	138
Denied Entry Before	1	5	1	1	1	2	1
Denied Entry After	0	2	3	1	3	2	2
Travel Distance (mi)	3615	3696	3690	3588	3516	3641	3650
Travel Time (hr)	140.5	142.7	141.0	139.1	136.3	141.2	139.8
Total Delay (hr)	46.5	46.6	45.1	45.8	44.7	47.1	45.4
Total Stops	4033	4068	3997	3999	3964	4025	3953
Fuel Used (gal)	126.1	128.2	127.3	124.7	122.4	127.1	127.2

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	11:45	11:45	11:45	11:45
End Time	1:00	1:00	1:00	1:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	6664	6746	6572	6627
Vehs Exited	6684	6768	6564	6627
Starting Vehs	143	157	149	140
Ending Vehs	123	135	157	140
Denied Entry Before	1	3	3	0
Denied Entry After	3	1	1	0
Travel Distance (mi)	3692	3724	3614	3643
Travel Time (hr)	141.5	145.0	140.5	140.7
Total Delay (hr)	45.8	48.3	46.6	46.2
Total Stops	4110	4178	4031	4036
Fuel Used (gal)	128.1	130.1	126.3	126.8

Interval #0 Information Seeding

Start Time	11:45
End Time	12:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	12:00
End Time	1:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	6585	6741	6718	6516	6482	6585	6620
Vehs Exited	6619	6715	6708	6544	6490	6570	6610
Starting Vehs	166	148	133	130	141	116	128
Ending Vehs	132	174	143	102	133	131	138
Denied Entry Before	1	5	1	1	1	2	1
Denied Entry After	0	2	3	1	3	2	2
Travel Distance (mi)	3615	3696	3690	3588	3516	3641	3650
Travel Time (hr)	140.5	142.7	141.0	139.1	136.3	141.2	139.8
Total Delay (hr)	46.5	46.6	45.1	45.8	44.7	47.1	45.4
Total Stops	4033	4068	3997	3999	3964	4025	3953
Fuel Used (gal)	126.1	128.2	127.3	124.7	122.4	127.1	127.2

Interval #1 Information Recording

Start Time	12:00
End Time	1:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	6664	6746	6572	6627
Vehs Exited	6684	6768	6564	6627
Starting Vehs	143	157	149	140
Ending Vehs	123	135	157	140
Denied Entry Before	1	3	3	0
Denied Entry After	3	1	1	0
Travel Distance (mi)	3692	3724	3614	3643
Travel Time (hr)	141.5	145.0	140.5	140.7
Total Delay (hr)	45.8	48.3	46.6	46.2
Total Stops	4110	4178	4031	4036
Fuel Used (gal)	128.1	130.1	126.3	126.8

3: Clyde Morris Blvd & Reed Canal Rd Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.2	0.1	0.1	0.4
Denied Del/Veh (s)	2.1	0.6	0.5	0.8
Total Delay (hr)	1.7	2.8	2.0	6.5
Total Del/Veh (s)	19.9	12.0	8.3	11.6
Stop Delay (hr)	1.4	1.5	1.0	3.9
Stop Del/Veh (s)	16.6	6.3	4.1	6.9
Total Stops	230	353	279	862
Stop/Veh	0.77	0.42	0.34	0.44
Travel Dist (mi)	83.9	169.1	189.6	442.7
Travel Time (hr)	4.4	6.8	6.5	17.8
Avg Speed (mph)	20	25	30	26
Fuel Used (gal)	2.4	5.0	5.3	12.7
Fuel Eff. (mpg)	32.0	33.3	34.9	33.7
HC Emissions (g)	17	54	71	142
CO Emissions (g)	564	2793	2773	6129
NOx Emissions (g)	62	190	267	519
Vehicles Entered	294	832	872	1998
Vehicles Exited	294	828	871	1993
Hourly Exit Rate	294	828	871	1993
Input Volume	299	820	856	1975
% of Volume	98	101	102	101
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0
Density (ft/veh)	702	481	539	556
Occupancy (veh)	4	7	6	17

5: Clyde Morris Blvd & Madeline Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.2	0.2	0.1	0.2	0.7
Denied Del/Veh (s)	1.5	1.8	0.4	1.0	1.0
Total Delay (hr)	3.8	3.1	5.2	5.5	17.6
Total Del/Veh (s)	30.6	33.5	24.6	21.0	25.5
Stop Delay (hr)	3.2	2.6	3.7	3.8	13.3
Stop Del/Veh (s)	25.5	28.5	17.6	14.4	19.3
Total Stops	366	267	479	562	1674
Stop/Veh	0.82	0.80	0.63	0.60	0.67
Travel Dist (mi)	50.1	55.9	351.4	215.7	673.0
Travel Time (hr)	5.6	5.0	13.3	10.9	34.8
Avg Speed (mph)	9	12	27	20	20
Fuel Used (gal)	2.5	2.4	9.6	6.9	21.5
Fuel Eff. (mpg)	19.7	23.1	36.5	31.2	31.3
HC Emissions (g)	23	23	114	79	240
CO Emissions (g)	978	886	3325	3491	8680
NOx Emissions (g)	73	71	478	273	895
Vehicles Entered	442	327	750	935	2454
Vehicles Exited	439	327	754	936	2456
Hourly Exit Rate	439	327	754	936	2456
Input Volume	442	325	772	927	2466
% of Volume	99	101	98	101	100
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)	330	372	743	457	536
Occupancy (veh)	5	5	13	11	34

9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.1	0.1	0.1	0.2	0.5
Denied Del/Veh (s)	1.2	2.0	0.5	0.6	0.8
Total Delay (hr)	3.0	1.3	4.8	6.0	15.2
Total Del/Veh (s)	31.7	25.2	23.4	23.3	24.8
Stop Delay (hr)	2.6	1.2	3.5	4.1	11.4
Stop Del/Veh (s)	27.7	22.6	16.9	15.9	18.6
Total Stops	280	153	453	594	1480
Stop/Veh	0.83	0.83	0.61	0.64	0.67
Travel Dist (mi)	53.6	18.4	188.6	389.9	650.5
Travel Time (hr)	4.8	2.2	9.3	15.2	31.5
Avg Speed (mph)	11	9	20	26	21
Fuel Used (gal)	2.4	0.9	5.9	10.6	19.8
Fuel Eff. (mpg)	22.2	20.3	31.9	37.0	32.9
HC Emissions (g)	26	5	63	79	173
CO Emissions (g)	1023	180	2676	2961	6840
NOx Emissions (g)	78	18	233	390	719
Vehicles Entered	335	182	738	920	2175
Vehicles Exited	335	182	735	920	2172
Hourly Exit Rate	335	182	735	920	2172
Input Volume	340	178	745	930	2193
% of Volume	99	102	99	99	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)	537	515	439	594	534
Occupancy (veh)	5	2	9	15	31

Total Network Performance

Denied Delay (hr)	1.6
Denied Del/Veh (s)	0.9
Total Delay (hr)	44.6
Total Del/Veh (s)	23.7
Stop Delay (hr)	28.9
Stop Del/Veh (s)	15.4
Total Stops	4036
Stop/Veh	0.60
Travel Dist (mi)	3642.7
Travel Time (hr)	140.7
Avg Speed (mph)	26
Fuel Used (gal)	126.8
Fuel Eff. (mpg)	28.7
HC Emissions (g)	1459
CO Emissions (g)	57651
NOx Emissions (g)	5596
Vehicles Entered	6627
Vehicles Exited	6627
Hourly Exit Rate	6627
Input Volume	13268
% of Volume	50
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	320
Occupancy (veh)	139

Intersection: 3: Clyde Morris Blvd & Reed Canal Rd

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	144	165	217	195	104	91	159	141
Average Queue (ft)	84	34	118	74	30	41	79	62
95th Queue (ft)	137	95	183	151	69	78	131	117
Link Distance (ft)		1498	1073	1073			1147	1147
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100				100	100		
Storage Blk Time (%)	6	0		2	0	0	3	
Queuing Penalty (veh)	6	0		2	0	1	2	

Intersection: 5: Clyde Morris Blvd & Madeline Ave

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	T	R	L	T	T
Maximum Queue (ft)	160	286	70	173	246	119	230	253	125	158	266	255
Average Queue (ft)	86	126	29	71	108	37	126	127	29	53	152	129
95th Queue (ft)	151	234	57	132	197	82	202	218	101	109	232	225
Link Distance (ft)		594	594		896		2460	2460			1214	1214
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	110			150		200			100	200		
Storage Blk Time (%)	4	14		0	4		1	15	0		2	12
Queuing Penalty (veh)	8	23		0	5		0	9	0		3	17

Intersection: 5: Clyde Morris Blvd & Madeline Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	125
Average Queue (ft)	58
95th Queue (ft)	131
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	LT	R	L	T	TR	L	T	T	R
Maximum Queue (ft)	212	120	71	153	92	101	237	219	149	269	294	125
Average Queue (ft)	107	49	29	66	29	45	145	127	45	154	155	79
95th Queue (ft)	183	98	56	125	64	84	217	203	104	239	252	154
Link Distance (ft)	839	839		530			1348	1348		2234	2234	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			220		100	210			240			100
Storage Blk Time (%)				3	0		1			1	20	0
Queuing Penalty (veh)				3	0		1			1	32	1

Network Summary

Network wide Queuing Penalty: 114

Intersection: 3: Clyde Morris Blvd & Reed Canal Rd

Phase	1	2	6	8
Movement(s) Served	SBL	NBT	SBTL	WBL
Maximum Green (s)	12.0	42.0	63.0	28.0
Minimum Green (s)	5.0	15.0	15.0	10.0
Recall	None	Min	Min	None
Avg. Green (s)	7.2	33.6	43.6	13.7
g/C Ratio	-0.01	NA	-0.01	-0.01
Cycles Skipped (%)	54	0	4	4
Cycles @ Minimum (%)	4	0	0	31
Cycles Maxed Out (%)	2	29	6	0
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 5: Clyde Morris Blvd & Madeline Ave

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Maximum Green (s)	22.5	42.5	23.0	23.0	22.5	42.5	23.0	23.0
Minimum Green (s)	5.0	15.0	5.0	7.0	5.0	15.0	5.0	7.0
Recall	None	Min	None	None	None	Min	None	None
Avg. Green (s)	10.5	36.2	13.0	20.0	8.8	40.3	11.5	20.6
g/C Ratio	-0.01	NA	-0.01	-0.01	-0.01	NA	-0.01	-0.01
Cycles Skipped (%)	18	0	3	6	37	0	9	3
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	0	29	6	32	0	46	3	34
Cycles with Peds (%)	0	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy

Phase	1	2	3	4	5	6
Movement(s) Served	NBL	SBTL	EBTL	WBTL	SBL	NBTL
Maximum Green (s)	11.0	41.0	21.5	22.0	11.0	41.0
Minimum Green (s)	5.0	15.0	10.0	10.0	5.0	15.0
Recall	None	Min	None	None	None	Min
Avg. Green (s)	7.8	37.7	15.2	14.0	7.5	38.2
g/C Ratio	-0.01	NA	NA	-0.01	-0.01	NA
Cycles Skipped (%)	34	0	0	9	37	0
Cycles @ Minimum (%)	0	0	17	31	0	0
Cycles Maxed Out (%)	9	46	11	9	3	43
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	4:45	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	8370	8564	8578	8542	8439	8397	8499
Vehs Exited	8404	8606	8555	8579	8458	8367	8507
Starting Vehs	202	227	197	222	237	186	216
Ending Vehs	168	185	220	185	218	216	208
Denied Entry Before	2	2	1	2	0	2	1
Denied Entry After	2	1	0	1	3	2	1
Travel Distance (mi)	4508	4653	4638	4623	4575	4537	4591
Travel Time (hr)	203.3	216.3	208.9	206.6	206.2	202.6	211.3
Total Delay (hr)	74.1	82.6	75.5	74.5	75.2	72.6	79.7
Total Stops	5567	6016	5628	5687	5652	5477	5797
Fuel Used (gal)	156.6	163.6	161.3	160.3	159.0	156.5	161.0

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	8489	8479	8401	8476
Vehs Exited	8524	8487	8436	8492
Starting Vehs	240	239	211	218
Ending Vehs	205	231	176	204
Denied Entry Before	1	2	2	0
Denied Entry After	2	2	2	0
Travel Distance (mi)	4596	4567	4546	4583
Travel Time (hr)	207.1	211.1	200.8	207.4
Total Delay (hr)	75.5	79.8	70.7	76.0
Total Stops	5626	5914	5399	5676
Fuel Used (gal)	160.3	160.3	156.7	159.6

Interval #0 Information Seeding

Start Time	4:45
End Time	5:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	5:00
End Time	6:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	8370	8564	8578	8542	8439	8397	8499
Vehs Exited	8404	8606	8555	8579	8458	8367	8507
Starting Vehs	202	227	197	222	237	186	216
Ending Vehs	168	185	220	185	218	216	208
Denied Entry Before	2	2	1	2	0	2	1
Denied Entry After	2	1	0	1	3	2	1
Travel Distance (mi)	4508	4653	4638	4623	4575	4537	4591
Travel Time (hr)	203.3	216.3	208.9	206.6	206.2	202.6	211.3
Total Delay (hr)	74.1	82.6	75.5	74.5	75.2	72.6	79.7
Total Stops	5567	6016	5628	5687	5652	5477	5797
Fuel Used (gal)	156.6	163.6	161.3	160.3	159.0	156.5	161.0

Interval #1 Information Recording

Start Time	5:00
End Time	6:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	8489	8479	8401	8476
Vehs Exited	8524	8487	8436	8492
Starting Vehs	240	239	211	218
Ending Vehs	205	231	176	204
Denied Entry Before	1	2	2	0
Denied Entry After	2	2	2	0
Travel Distance (mi)	4596	4567	4546	4583
Travel Time (hr)	207.1	211.1	200.8	207.4
Total Delay (hr)	75.5	79.8	70.7	76.0
Total Stops	5626	5914	5399	5676
Fuel Used (gal)	160.3	160.3	156.7	159.6

3: Clyde Morris Blvd & Reed Canal Rd Performance by approach

Approach	WB	NB	SB	All
Denied Delay (hr)	0.2	0.1	0.2	0.5
Denied Del/Veh (s)	2.0	0.6	0.5	0.7
Total Delay (hr)	2.9	3.8	3.5	10.1
Total Del/Veh (s)	28.2	14.1	10.0	14.1
Stop Delay (hr)	2.5	2.1	1.8	6.3
Stop Del/Veh (s)	24.1	8.0	5.0	8.8
Total Stops	301	405	418	1124
Stop/Veh	0.82	0.42	0.33	0.43
Travel Dist (mi)	102.3	194.1	273.6	570.0
Travel Time (hr)	6.7	8.4	10.0	25.0
Avg Speed (mph)	16	24	28	23
Fuel Used (gal)	3.4	5.7	7.7	16.9
Fuel Eff. (mpg)	29.1	33.2	35.6	33.4
HC Emissions (g)	26	67	72	165
CO Emissions (g)	629	3156	3212	6997
NOx Emissions (g)	77	226	300	603
Vehicles Entered	359	953	1256	2568
Vehicles Exited	359	958	1259	2576
Hourly Exit Rate	359	958	1259	2576
Input Volume	361	942	1271	2574
% of Volume	99	102	99	100
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0
Density (ft/veh)	463	390	351	394
Occupancy (veh)	6	8	10	25

5: Clyde Morris Blvd & Madeline Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.2	0.2	0.1	0.4	0.9
Denied Del/Veh (s)	1.3	1.6	0.5	1.1	1.0
Total Delay (hr)	6.6	5.9	7.9	10.8	31.2
Total Del/Veh (s)	37.1	51.9	30.4	30.6	34.5
Stop Delay (hr)	5.7	5.3	5.8	7.6	24.4
Stop Del/Veh (s)	32.3	45.9	22.5	21.4	26.9
Total Stops	572	399	637	911	2519
Stop/Veh	0.90	0.97	0.68	0.72	0.77
Travel Dist (mi)	71.2	68.8	432.6	290.2	862.8
Travel Time (hr)	9.4	8.5	18.0	18.1	54.0
Avg Speed (mph)	8	8	24	16	16
Fuel Used (gal)	3.9	3.4	12.1	9.7	29.1
Fuel Eff. (mpg)	18.5	20.0	35.7	30.0	29.7
HC Emissions (g)	22	18	131	73	244
CO Emissions (g)	948	659	3930	3851	9389
NOx Emissions (g)	78	58	552	267	956
Vehicles Entered	626	402	923	1259	3210
Vehicles Exited	630	405	915	1254	3204
Hourly Exit Rate	630	405	915	1254	3204
Input Volume	632	397	930	1250	3209
% of Volume	100	102	98	100	100
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)	195	215	551	273	344
Occupancy (veh)	9	8	18	18	53

9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy Performance by approach

Approach	EB	WB	NB	SB	All
Denied Delay (hr)	0.1	0.1	0.1	0.2	0.7
Denied Del/Veh (s)	1.2	1.7	0.6	0.8	0.9
Total Delay (hr)	4.7	3.3	6.6	10.4	25.0
Total Del/Veh (s)	38.5	37.5	30.3	31.0	32.7
Stop Delay (hr)	4.2	2.9	5.0	7.3	19.4
Stop Del/Veh (s)	34.7	32.4	23.1	21.6	25.4
Total Stops	363	288	520	862	2033
Stop/Veh	0.83	0.90	0.66	0.71	0.74
Travel Dist (mi)	68.1	32.2	197.9	500.8	799.0
Travel Time (hr)	7.2	4.6	11.3	22.3	45.5
Avg Speed (mph)	10	7	18	23	18
Fuel Used (gal)	3.2	1.9	6.5	14.2	25.8
Fuel Eff. (mpg)	21.3	16.7	30.7	35.3	31.0
HC Emissions (g)	18	7	66	115	206
CO Emissions (g)	740	453	2807	4174	8174
NOx Emissions (g)	60	34	235	519	848
Vehicles Entered	425	317	773	1183	2698
Vehicles Exited	427	316	772	1181	2696
Hourly Exit Rate	427	316	772	1181	2696
Input Volume	431	318	754	1179	2682
% of Volume	99	99	102	100	101
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)	356	236	360	405	369
Occupancy (veh)	7	4	11	22	45

Total Network Performance

Denied Delay (hr)	2.1
Denied Del/Veh (s)	0.9
Total Delay (hr)	73.9
Total Del/Veh (s)	30.6
Stop Delay (hr)	50.4
Stop Del/Veh (s)	20.9
Total Stops	5676
Stop/Veh	0.65
Travel Dist (mi)	4583.4
Travel Time (hr)	207.4
Avg Speed (mph)	22
Fuel Used (gal)	159.6
Fuel Eff. (mpg)	28.7
HC Emissions (g)	1469
CO Emissions (g)	55047
NOx Emissions (g)	5479
Vehicles Entered	8476
Vehicles Exited	8492
Hourly Exit Rate	8492
Input Volume	16930
% of Volume	50
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	217
Occupancy (veh)	205

Intersection: 3: Clyde Morris Blvd & Reed Canal Rd

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	149	284	259	235	123	145	217	225
Average Queue (ft)	113	79	148	110	42	62	109	99
95th Queue (ft)	163	217	229	205	105	115	182	181
Link Distance (ft)		1498	1073	1073			1147	1147
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100				100	100		
Storage Blk Time (%)	18	0		6	0	2	7	
Queuing Penalty (veh)	21	1		7	0	10	10	

Intersection: 5: Clyde Morris Blvd & Madeline Ave

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	T	R	L	T	T
Maximum Queue (ft)	160	382	142	200	443	226	302	305	125	250	405	398
Average Queue (ft)	125	198	59	110	203	85	167	175	49	120	240	236
95th Queue (ft)	188	339	108	208	375	168	251	263	136	249	368	361
Link Distance (ft)		594	594		896		2460	2460			1214	1214
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	110			150		200			100	200		
Storage Blk Time (%)	12	32		2	23	0	3	25	0	0	14	30
Queuing Penalty (veh)	31	59		5	32	0	5	20	0	0	26	71

Intersection: 5: Clyde Morris Blvd & Madeline Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	125
Average Queue (ft)	90
95th Queue (ft)	161
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	2

Intersection: 9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	LT	R	L	T	TR	L	T	T	R
Maximum Queue (ft)	276	149	104	317	150	178	263	246	289	385	398	150
Average Queue (ft)	147	69	40	149	63	70	172	155	73	228	243	124
95th Queue (ft)	240	128	78	262	152	133	249	235	185	348	372	197
Link Distance (ft)	839	839		530			1348	1348		2234	2234	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			220		100	210			240			100
Storage Blk Time (%)				24	0	0	2		0	6	36	2
Queuing Penalty (veh)				28	0	0	3		0	6	102	7

Network Summary

Network wide Queuing Penalty: 447

Intersection: 3: Clyde Morris Blvd & Reed Canal Rd

Phase	1	2	6	8
Movement(s) Served	SBL	NBT	SBTL	WBL
Maximum Green (s)	12.0	42.0	63.0	28.0
Minimum Green (s)	5.0	15.0	15.0	10.0
Recall	None	Max	Max	None
Avg. Green (s)	8.2	51.9	63.5	18.1
g/C Ratio	-0.01	NA	NA	NA
Cycles Skipped (%)	32	0	0	0
Cycles @ Minimum (%)	0	0	0	8
Cycles Maxed Out (%)	8	100	100	11
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 5: Clyde Morris Blvd & Madeline Ave

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	SBL	NBTL	EBL	WBTL	NBL	SBTL	WBL	EBTL
Maximum Green (s)	22.5	42.5	23.0	23.0	22.5	42.5	23.0	23.0
Minimum Green (s)	5.0	15.0	5.0	7.0	5.0	15.0	5.0	7.0
Recall	None	Max	None	None	None	Max	None	None
Avg. Green (s)	13.8	46.9	15.1	24.0	13.2	47.4	12.4	26.7
g/C Ratio	-0.01	NA	NA	NA	-0.01	NA	NA	NA
Cycles Skipped (%)	7	0	0	0	7	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	4	100	7	71	4	100	0	82
Cycles with Peds (%)	0	0	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 9: Clyde Morris Blvd & Willow Run Blvd/City Center Pkwy

Phase	1	2	3	4	5	6
Movement(s) Served	NBL	SBTL	EBTL	WBTL	SBL	NBTL
Maximum Green (s)	11.0	41.0	21.5	22.0	11.0	41.0
Minimum Green (s)	5.0	15.0	10.0	10.0	5.0	15.0
Recall	None	Max	None	None	None	Max
Avg. Green (s)	8.9	44.7	19.0	19.3	8.5	46.4
g/C Ratio	-0.01	NA	NA	NA	-0.01	NA
Cycles Skipped (%)	11	0	0	0	18	0
Cycles @ Minimum (%)	0	0	0	0	0	0
Cycles Maxed Out (%)	25	100	45	55	14	100
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary
Average Cycle Length (s): NA

Number of Complete Cycles : 0

From: "Kandala, Srinivas" <SKandala@VHB.com>
To: "Bobby Maddox" <bmaddox@volusia.org>, "Sean Castello" <scastello@volusia...
CC: "Colleen Nicoulin" <CNicoulin@r2ctpo.org>, "Ambikapathy, Babuji" <BAmbik...
Date: 1/3/2020 10:05 AM
Subject: [EX] Signal Timings

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Bob,
We (VHB) working with R2CTPO on Clyde Morris Blvd feasibility study and Taylor Rd feasibility study. We appreciate if you could send us the latest signal timings for the following intersections:

1. Clyde Morris Blvd and Reed Canal Rd
2. Clyde Morris Blvd and Madeline Ave
3. Clyde Morris Blvd and Willow Run Blvd
4. Taylor Rd at Williamson Blvd
5. Taylor Rd at I-95 SB Ramps
6. Taylor Rd at I-95 NB Ramps
7. Taylor Rd at Dunlawton Ave

Thanks,
Srinivas Kandala, PE
Transportation Engineer

[cid:image001.png@01D5C21D.47DD8E40]

225 E. Robinson Street, Suite 300
Landmark Center Two
Orlando, FL 32801-4326
P 407.965.0554 | M 813.407.0879 | F 407.839.4008
skandala@vhb.com<mailto:SKandala@VHB.com>

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COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: Clyde Morris Blvd & Reed Canal Rd
Port Orange

FREE: X

DATE: 5/11/2017

SIGNAL #: 268

CO-ORD:

Design By: M. Tobin

NETWORK #: Port Orange Area Network # 60

Volusia County FLORIDA

Controller Timing Chart

PHASE	1	2	3	4	5	6	7	8	
DIRECTION	SBL	NB				SB		WB	
TURN TYPE	PERM/PROT	-				-		-	
MIN GREEN	5	15				15		10	
WALK		7				7		7	
PED CLR		22				22		22	
YELLOW	5.0	5.0				5.0		4.0	
RED CLR	3.0	3.0				2.0		3.0	
EXTENSION	3	4				4		3	
MAX 1	20	50				50		35	
MAX 2									
MAX 3		-				-		-	
DYM MAX		90				90			
DYM STP		10				10			
RECALL		MIN				MIN		-	
DETECTOR	NON-LOCK	LOCK				LOCK		NON-LOCK	
FLASH	RED	YELLOW				YELLOW		RED	

COORDINATION TIMINGS

PATTERN	1	2	3	4	5	6	7	8	
CYCLE				-	-	-	-	-	
OFFSET				-	-	-	-	-	

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

Controller IP		Switch IP		Camera IP	
Controller Gateway	1	Switch Gateway		Camera Gateway	

REMARKS:

1 2
6 8

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: Clyde Morris Blvd & Reed Canal Rd
Port Orange

FREE: X

DATE: 5/11/2017

SIGNAL #: 268

CO-ORD:

Design By: M. Tobin

NETWORK #: Port Orange Area Network # 60

Volusia County FLORIDA

TIME OF DAY SCHEDULE

BASE DAY		1	2	3	4	5	6	7	Crosswalk Length
MON #1	TIME	00:00 00:00							
	PATTERN	FREE							P2
TUES #1	TIME	00:00 00:00							
	PATTERN	FREE							77
WED #1	TIME	00:00 00:00							
	PATTERN	FREE							P4
THU #1	TIME	00:00 00:00							
	PATTERN	FREE							
FRI #1	TIME	00:00 00:00							
	PATTERN	FREE							P6
SAT #2	TIME	00:00 00:00							
	PATTERN	FREE							
SUN #2	TIME	00:00 00:00							
	PATTERN	FREE							P8

CONTROLLER TYPE		CONDITION OF OVERHEAD	GOOD	PROGRAM NUMBER	74
Econolite Cobalt		OVERHEAD STREET NAMES	NO		
PHASES:	8Φ	ILLUMINATED STREET NAMES	YES	32.62.00	SIGNAL OWNER
CABINET TYPE	VI	PRE-EMPTION	YES	Controller IP Address	County
CABINET DATE		PRE-EMPTION TYPE	INFRARED		LED YES

REMARKS:

1	2	3	4
5	6	8	

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: Clyde Morris Blvd @ Madeline Ave
Port Orange

FREE: X

DATE: 5/11/2017

SIGNAL #: 280

CO-ORD:

Design By: M. Tobin

NETWORK #: Port Orange Area Network # 60

Controller Timing Chart

PHASE	1	2	3	4	5	6	7	8	
DIRECTION	SBL	NB	EBL	WB	NBL	SB	WBL	EB	
TURN TYPE	PERM/PROT	-	PERM/PROT		PERM/PROT	-	PERM/PROT	-	
MIN GREEN	5	15	5	7	5	15	5	7	
WALK		7		7		7		7	
PED CLR		28		25		28		25	
YELLOW	4.5	4.5	4.0	4.0	4.5	4.5	4.0	4.0	
RED CLR	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
EXTENSION	4	4	3	3	4	4	3	3	
MAX 1	30	50	30	30	30	50	30	30	
MAX 2									
MAX 3		-				-		-	
DYM MAX		90				90			
DYM STP		10				10			
RECALL		MIN				MIN		-	
DETECTOR	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	
FLASH	-	YELLOW	RED	RED	-	YELLOW	RED	RED	

COORDINATION TIMINGS

PATTERN	1	2	3	4	5	6	7	8	
CYCLE				-	-	-	-	-	
OFFSET				-	-	-	-	-	

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

Controller IP		Switch IP		Camera IP	
Controller Gateway	1	Switch Gateway		Camera Gateway	

REMARKS:

1	2	3	4
5	6	7	8

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: Clyde Morris Blvd @ Madeline Ave
Port Orange

FREE: X

DATE: 5/11/2017

SIGNAL #: 280

CO-ORD:

Design By: M. Tobin

NETWORK #: Port Orange Area Network # 60

TIME OF DAY SCHEDULE

BASE DAY		1	2	3	4	5	6	7
MON #1	TIME	00:00 00:00						
	PATTERN	FREE						
TUES #1	TIME	00:00 00:00						
	PATTERN	FREE						
WED #1	TIME	00:00 00:00						
	PATTERN	FREE						
THU #1	TIME	00:00 00:00						
	PATTERN	FREE						
FRI #1	TIME	00:00 00:00						
	PATTERN	FREE						
SAT #2	TIME	00:00 00:00						
	PATTERN	FREE						
SUN #2	TIME	00:00 00:00						
	PATTERN	FREE						

CONTROLLER TYPE		CONDITION OF OVERHEAD	GOOD	PROGRAM NUMBER	
Econolite Cobalt		OVERHEAD STREET NAMES	NO		
PHASES:	8Φ	ILLUMINATED STREET NAMES	YES	32.62.00	
CABINET TYPE	VI	PRE-EMPTION	YES	Controller IP Address	
CABINET DATE		PRE-EMPTION TYPE	INFRARED		

Crosswalk Length	
P2	80
P4	80
P6	92
P8	78
SIGNAL OWNER	County
LED	YES

REMARKS:

1	2	3	4
5	6	7	8

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: Clyde Morris Blvd & Willow Run Blvd. /City Center Pkwy
Port Orange

FREE [X]

DATE: 1/12/2015

SIGNAL #: 171

CO-ORD: [ ]

Design By: M. Tobin

System #: 22

Controller Timing Chart

PHASE	1	2	3	4	5	6	7	8
DIRECTION	NBL	SB	EB	WB	SBL	NB	-	-
TURN TYPE	PERM/PROT	-	SPLIT LEAD	SPLIT LAG	PERM/PROT	-	-	-
MIN GREEN	5	15	10	10	5	15		
EXTENSION	3	4	3	4	3	4		
CLEARANCE	5.0	5.0	4.5	4.0	5.0	5.0		
ALL RED	4.0	4.0	4.0	4.0	4.0	4.0		
WALK	-	7	7	7	-	7		
FDW	-	32	26	26	-	32		
MAX 1	20	50	30	30	20	50		
MAX 2	-	-	-	-	-	-		
MAX 3	-	90	-	-	-	90		
ADJUST	-	10	-	-	-	10		
RECALL	-	MIN	-	-	-	MIN		
DETECTOR	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	NON-LOCK	LOCK		
FLASH	-	YELLOW	RED	RED	-	YELLOW		
SET	-	2	-	-	-	2		
CLEAR	-	2	-	-	-	2		

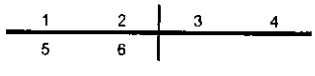
BASE DAY		1	2	3	4	5	6	7
MON #1	TIME	00:01-00:00						
	PLAN	FREE						
TUES#1	TIME	00:01-00:00						
	PLAN	FREE						
WED #1	TIME	00:01-00:00						
	PLAN	FREE						
THU #1	TIME	00:01-00:00						
	PLAN	FREE						
FRI #1	TIME	00:01-00:00						
	PLAN	FREE						
SAT #2	TIME	00:01-00:00						
	PLAN	FREE						
SUN #3	TIME	00:01-00:00						
	PLAN	FREE						

Crosswalk Length
P2
100 Feet
P4
72 Feet
P6
80 Feet
P8
90 Feet
SIGNAL OWNER

CONTROLLER TYPE		CONDITION OF OVERHEAD	Good	PROM NUMBER	
3000E		OVERHEAD STREET NAMES	YES		
PHASES:	8Φ	ILLUMINATED STREET NAMES	NO	8216A 3.7.3	
CABINET TYPE	V	PRE-EMPTION	YES	IP ADDRESS	
CABINET DATE	04/2008	PRE-EMPTION TYPE	INFRARED	LED	YES

REMARKS:

Switch IP - 10.77.5.18



SYSTEM INVENTORY

Volusia County FLORIDA

Controller IP.# ___ ___
Camera IP # ___ - ___

DATE: 1/12/2015 DESIGNED BY: M. Tobin

LOCATION: Clyde Morris Blvd & Willow Run Blvd. /City Center Pkwy

CITY: Port Orange SIGNAL ID NO: 171 SYSTEM ID: 22

CONTROLLER TIME CHART

MVMNT	MIN	EXT	CLR	A.R.	WALK	FDW	MAX1	MAX2	MAX3	ADJST	REC	DET	FL	SET	CLR
1	5	3	5	4	-	-	20	-	-	-	-	NL	-	-	-
2	15	4	5	4	7	32	50	-	90	10	MIN	L	Y	2	2
3	10	3	4.5	4	7	26	30	-	-	-	-	NL	R	-	-
4	10	4	4	4	7	26	30	-	-	-	-	NL	R	-	-
5	5	3	5	4	-	-	20	-	-	-	-	NL	-	-	-
6	15	4	5	4	7	32	50	-	90	10	MIN	L	Y	2	2
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TP# 1

CO-ORDINATION

PLAN	C1/S1	C2/S1	C3/S1	C4/S1	C5/S1	C6/S1		
CYCLE								
OFF 1								
OFF 2								
OFF 3								
OFF 4								
OFF 5								
PERM	10%	10%	10%	10%	10%	10%	10%	10%

PHASE SPLITS (seconds)

CY/SP	C1/S1	C2/S1	C3/S1	C4/S1	C5/S1	C6/S1		
PH 1	-	-	-	-	-	-		
PH 2	-	-	-	-	-	-		
PH 3	-	-	-	-	-	-		
PH 4	-	-	-	-	-	-		
PH 5	-	-	-	-	-	-		
PH 6	-	-	-	-	-	-		
PH 7	-	-	-	-	-	-		
PH 8	-	-	-	-	-	-		

1	2	3	4
5	6		

BASE DAY

		1	2	3	4	5	6	7	8	9	10	11	
MON #1	TIME	00:01-00:00											
	PLAN	FREE											
TUES#1	TIME	00:01-00:00											
	PLAN	FREE											
WED #1	TIME	00:01-00:00											
	PLAN	FREE											
THU #1	TIME	00:01-00:00											
	PLAN	FREE											
FRI #1	TIME	00:01-00:00											
	PLAN	FREE											
SAT #2	TIME	00:01-00:00											
	PLAN	FREE											
SUN #3	TIME	00:01-00:00											
	PLAN	FREE											

APPENDIX D: Supporting Documents for B/C Analysis

Operational Annual User Benefit

Benefit Period		Clyde Morris Blvd & Reed Canal Rd			Clyde Morris Blvd & Madeline Ave			Clyde Morris Blvd & Willow Run Blvd		
		Total Stops	Total Delay (veh-hrs)	Fuel Consumption (gal)	Total Stops	Total Delay (veh-hrs)	Fuel Consumption (gal)	Total Stops	Total Delay (veh-hrs)	Fuel Consumption (gal)
AM Peak Hour	Existing	1,193	10.2	15.2	1,982	25.3	24.7	1,564	18.4	19.7
	Proposed	1,178	9.8	15.1	1,968	24.4	24.6	1,493	16.0	19.2
Mid Peak Hour	Existing	867	6.6	12.8	1,703	18.6	21.8	1,490	16.0	19.9
	Proposed	862	6.5	12.7	1,674	17.6	21.5	1,480	15.2	19.8
PM Peak Hour	Existing	1,162	10.7	17.1	2,534	34.3	29.3	2,089	28.4	25.9
	Proposed	1,124	10.1	16.9	2,519	31.2	29.1	2,033	25.0	25.8
Estimated Daily (AM + Mid + PM)	Existing	9,666	82.5	135.3	18,657	234.6	227.4	15,429	188.4	196.5
	Proposed	9,492	79.2	134.1	18,483	219.6	225.6	15,018	168.6	194.4
Estimated Daily Savings		174	3.3	1.2	174	15.0	1.8	411	19.8	2.1
Estimated Unit Cost		$0.014	$18.120	$2.280	$0.014	$18.120	$2.280	$0.014	$18.120	$2.280
Daily User Benefit by MOE		$2.436	$59.796	$2.736	$2.436	$271.800	$4.104	$5.754	$358.776	$4.788
Daily User Benefit Total		64.97			278.34			369.32		
Annual User Benefit		**$19,490.40**			**$83,502.00**			**$110,795.40**		

UNIT PRICE WORK
CITY OF PORT ORANGE
NB CLYDE MORRIS TO EB REED CANAL RIGHT TURN LANE COSTS TO COMPLETE FS
FPID:

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	AMOUNT
	PED MOT PLAN	EA	1	$4,000.00	$4,000.00
	ADA COMPLIANCE: RECONSTRUCT SIX RAMPS	SY	96	$96.00	$9,216.00
	ADA COMPLIANCE: INDIVIDUAL BUTTON POSTS	EA	6	$3,000.00	$18,000.00
	ADA COMPLIANCE: ALUMINUM PED SIGNALS	EA	6	$5,000.00	$30,000.00
	DIRECTIONAL DRILLS	EA	3	$5,000.00	$15,000.00
	RIGHT-OF-WAY PARCELS	EA	2	$75,000.00	$150,000.00
	DIRECTIONAL DRILLS	SY	250	$50.00	$12,500.00
	LANE CLOSURES FOR SKIP STRIPE	EA	4	$2,500.00	$10,000.00
	SKIP STRIPE AND RPM'S	EA	1	$4,500.00	$4,500.00
	LANE CLOSURES FOR REMOVE CROSS-WALK	EA	5	$2,500.00	$12,500.00
	LANE CLOSURES FOR NEW CROSS-WALK	EA	5	$2,500.00	$12,500.00
	NEW CROSS-WALK	EA	1	$5,600.00	$5,600.00
	OVERHEAD, LED, "NO TURN ON RED" SIGN	EA	1	$14,000.00	$14,000.00
	OVERHEAD SIGN CONTROLS	EA	1	$5,000.00	$5,000.00
	OVERHEAD SIGN CABLING	EA	1	$14,000.00	$14,000.00
				TOTAL	**$316,816.00**
				ROUNDED	**$317,000.00**
	2020 Feasibility Study Estimate				$197,709.00
	2020 Estimate			**TOTAL**	**$514,709.00**

TOTAL PROJECT

UNIT PRICE WORK
CITY OF PORT ORANGE
NB CLYDE MORRIS TO EB MADELINE RIGHT TURN LANE COSTS TO COMPLETE FS
FPID:

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	AMOUNT
	PED MOT PLAN	EA	1	$4,000.00	$4,000.00
	ADA COMPLIANCE: RECONSTRUCT SIX RAMPS	SY	96	$96.00	$9,216.00
	ADA COMPLIANCE: INDIVIDUAL BUTTON POSTS	EA	6	$3,000.00	$18,000.00
	ADA COMPLIANCE: ALUMINUM PED SIGNALS	EA	6	$5,000.00	$30,000.00
	DIRECTIONAL DRILLS	EA	3	$5,000.00	$15,000.00
	RIGHT-OF-WAY PARCELS	EA	2	$87,500.00	$175,000.00
	DIRECTIONAL DRILLS	SY	250	$50.00	$12,500.00
	LANE CLOSURES FOR SKIP STRIPE	EA	4	$2,500.00	$10,000.00
	SKIP STRIPE AND RPM'S	EA	1	$4,500.00	$4,500.00
	LANE CLOSURES FOR REMOVE CROSS-WALK	EA	5	$2,500.00	$12,500.00
	LANE CLOSURES FOR NEW CROSS-WALK	EA	5	$2,500.00	$12,500.00
	NEW CROSS-WALK	EA	1	$5,600.00	$5,600.00
	OVERHEAD, LED, "NO TURN ON RED" SIGN	EA	1	$14,000.00	$14,000.00
	OVERHEAD SIGN CONTROLS	EA	1	$5,000.00	$5,000.00
	OVERHEAD SIGN CABLING	EA	1	$14,000.00	$14,000.00
	REMOVE AND REPLACE CUMBERLAND PLANTS, IRRIG., AND MULCH	LS	1	$30,000.00	$30,000.00
				TOTAL	**$371,816.00**
				ROUNDED	**$372,000.00**
	2020 Feasibility Study Estimate				$129,633.00
	2020 Estimate			**TOTAL**	**$501,633.00**

TOTAL PROJECT

UNIT PRICE WORK
CITY OF PORT ORANGE
SB CLYDE MORRIS TO WB MADELINE RIGHT TURN LANE COSTS TO COMPLETE FS
FPID:

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	AMOUNT
	PED MOT PLAN	EA	1	$4,000.00	$4,000.00
	ADA COMPLIANCE: RECONSTRUCT TWO RAMPS	SY	32	$96.00	$3,072.00
	ADA COMPLIANCE: INDIVIDUAL BUTTON POSTS	EA	4	$3,000.00	$12,000.00
	ADA COMPLIANCE: ALUMINUM PED SIGNALS	EA	2	$5,000.00	$10,000.00
	DIRECTIONAL DRILLS	EA	2	$5,000.00	$10,000.00
	RIGHT-OF-WAY PARCELS	EA	2	$50,000.00	$100,000.00
	DIRECTIONAL DRILLS	SY	250	$50.00	$12,500.00
	LANE CLOSURES FOR SKIP STRIPE	EA	4	$2,500.00	$10,000.00
	SKIP STRIPE AND RPM'S	EA	1	$4,500.00	$4,500.00
	LANE CLOSURES FOR REMOVE CROSS-WALK	EA	4	$2,500.00	$10,000.00
	LANE CLOSURES FOR NEW CROSS-WALK	EA	4	$2,500.00	$10,000.00
	NEW CROSS-WALK	EA	1	$5,600.00	$5,600.00
	NEW STRAIN POLE	EA	1	$15,000.00	$15,000.00
	NEW SIGNAL CABLING	LS	1	$15,000.00	$15,000.00
	REMOVE OLD STRAIN POLE	LS	1	$7,000.00	$7,000.00
				TOTAL	**$228,672.00**
				ROUNDED	**$229,000.00**
	2020 Feasibility Study Estimate				$184,451.00
	2020 Estimate			**TOTAL**	**$413,451.00**

TOTAL PROJECT

FOUR

UNIT PRICE WORK
CITY OF PORT ORANGE
SB CLYDE MORRIS TO WB WILLOW RUN RIGHT TURN LANE COSTS TO COMPLETE FS
FPID:

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	AMOUNT
	PED MOT PLAN	EA	1	$4,000.00	$4,000.00
	ADA COMPLIANCE: RECONSTRUCT FOUR RAMPS	SY	64	$96.00	$6,144.00
	ADA COMPLIANCE: INDIVIDUAL BUTTON POSTS	EA	2	$3,000.00	$6,000.00
	ADA COMPLIANCE: ALUMINUM PED SIGNALS	EA	2	$5,000.00	$10,000.00
	DIRECTIONAL DRILLS	EA	2	$5,000.00	$10,000.00
	RIGHT-OF-WAY PARCELS	EA	1	$50,000.00	$50,000.00
	LANE CLOSURES FOR SKIP STRIPE	EA	6	$2,500.00	$15,000.00
	SKIP STRIPE AND RPM'S	EA	1	$4,500.00	$4,500.00
	LANE CLOSURES FOR REMOVE CROSS-WALK	EA	5	$2,500.00	$12,500.00
	LANE CLOSURES FOR NEW CROSS-WALK	EA	5	$2,500.00	$12,500.00
	NEW CROSS-WALK	EA	1	$5,600.00	$5,600.00
	NEW SIGNAL CABLING (PED ONLY)	LS	1	$4,000.00	$4,000.00
	REPLACE COMPLIANCE LANDSCAPING AND IRRIG ALONG CHURCH FRONYAGE	LS	1	$20,000.00	$20,000.00
	SKIP STRIPE AND RPM'S	EA	1	$2,500.00	$2,500.00
	LANE CLOSURES TO COMPLETE MINOR SKIP STRIPE	EA	2	$2,500.00	$5,000.00
				TOTAL	**$167,744.00**
				ROUNDED	**$168,000.00**
	2020 Feasibility Study Estimate				$157,445.00
	2020 Estimate			**TOTAL**	**$325,445.00**

TOTAL PROJECT

Roadway Design
Florida's Transportation Engineers

Rev. 02/2014

Benefit-Cost Analysis

District: **Five** County: **79 - Volusia** Date Prepared: 02/19/20

Location: **Clyde Morris Blvd at Reed Canal Rd**

Section : Beg. Milepost : End Milepost :

Rdway Type: **4 - 5 Lanes Urban Divided**

Control Element: **Other (describe in box below)**

NB Right Turn Lane

ANNUAL COST OF IMPROVEMENTS

Type	Cost	Service Life	Capital Recovery Factor	Total
ROW		100	0.0408	$ -
P.E.C.E.I.		15	0.0899	$ -
Structure		75	0.0425	$ -
Roadway		20	0.0736	$ -
Drainage		20	0.0736	$ -
Signal		20	0.0736	$ -
Other	$ 514,709.00	20	0.0736	$ 37,873.19
Sub-Total	$ 514,709.00			$ 37,873.19
			Annual Cost =	$ 37,873.19

Total number of crashes =
# of correctable crashes, PC = 5
# of years of crash data, YD = 3
PC/YD = 1.67
Crash reduction factor, CRF = 14.00%
CRF x (PC/YD) = 0.23
Cost per crash, CPC = $123,598.00
Benefit = $28,840

Primary crash reduction factor (%): 14

Additional crash reduction factor:

Additional crash reduction factor:

BENEFIT/COST RATIO

$$\frac{\text{Benefit}}{\text{Cost}} = \frac{\$28,839.53}{\$37,873.19} = \mathbf{0.76}$$

Cost per crash is updated to the relect the latest value used in the 2019 FDM (Table 122.6.1). Construction cost is for the NB right turn lane. CRF source is the CMF Clearinghouse Website.

Prepared by: VHB

Roadway Design
Florida's Transportation Engineers

Rev. 02/2014

Benefit-Cost Analysis

District: **Five** County: **79 - Volusia** Date Prepared: 02/19/20

Location: **Clyde Morris Blvd at Madeline Ave**

Section : Beg. Milepost : End Milepost :

Rdway Type: **4 - 5 Lanes Urban Divided**

Control Element: **Other (describe in box below)**

NB & SB Right Turn Lanes

ANNUAL COST OF IMPROVEMENTS

Type	Cost	Service Life	Capital Recovery Factor	Total
ROW		100	0.0408	$ -
P.E.C.E.I.		15	0.0899	$ -
Structure		75	0.0425	$ -
Roadway		20	0.0736	$ -
Drainage		20	0.0736	$ -
Signal		20	0.0736	$ -
Other	$ 915,084.00	20	0.0736	$ 67,333.48
Sub-Total	$ 915,084.00			$ 67,333.48
			Annual Cost =	$ 67,333.48

Total number of crashes =
# of correctable crashes, PC = 14
# of years of crash data, YD = 3
PC/YD = 4.67
Crash reduction factor, CRF = 26.00%
CRF x (PC/YD) = 1.21
Cost per crash, CPC = $123,598.00
Benefit = $149,966

Primary crash reduction factor (%): 26

Additional crash reduction factor:

Additional crash reduction factor:

BENEFIT/COST RATIO

$$\frac{\text{Benefit}}{\text{Cost}} = \frac{\$149{,}965.57}{\$67{,}333.48} = \mathbf{2.23}$$

Cost per crash is updated to the relect the latest value used in the 2019 FDM (Table 122.6.1). Construction cost is for the NB & SB right turn lane. CRF source is the CMF Clearinghouse Website.

Prepared by: VHB

Roadway Design
Florida's Transportation Engineers

Rev. 02/2014

Benefit-Cost Analysis

District: **Five** County: **79 - Volusia** Date Prepared: 02/19/20

Location: **Clyde Morris Blvd at Willow Run Blvd**

Section : Beg. Milepost : End Milepost :

Rdway Type: **4 - 5 Lanes Urban Divided**

Control Element: **Other (describe in box below)**

SB Right Turn Lane

ANNUAL COST OF IMPROVEMENTS

Type	Cost	Service Life	Capital Recovery Factor	Total
ROW		100	0.0408	$ -
P.E.C.E.I.		15	0.0899	$ -
Structure		75	0.0425	$ -
Roadway		20	0.0736	$ -
Drainage		20	0.0736	$ -
Signal		20	0.0736	$ -
Other	$ 325,445.00	20	0.0736	$ 23,946.81
Sub-Total	$ 325,445.00			$ 23,946.81
			Annual Cost =	$ 23,946.81

Total number of crashes =		Primary crash reduction factor (%):	14
# of correctable crashes, PC =	7		
# of years of crash data, YD =	3		
PC/YD =	2.33	Additional crash reduction factor:	
Crash reduction factor, CRF =	14.00%		
CRF x (PC/YD) =	0.33		
Cost per crash, CPC =	$123,598.00	Additional crash reduction factor:	
Benefit =	$40,375		

BENEFIT/COST RATIO

$$\frac{\text{Benefit}}{\text{Cost}} = \frac{\$40,375.35}{\$23,946.81} = \mathbf{1.69}$$

Cost per crash is updated to the relect the latest value used in the 2019 FDM (Table 122.6.1). Construction cost is for the SB right turn lane. CRF source is the CMF Clearinghouse Website.

Prepared by: VHB

ENGINEER'S ESTIMATE

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID # :	111111-1-11-11
PROJECT DESCRIPTION:	Clyde Morris Boulevard at Reed Canal Road Northbound Right Turn Lane Improvements
PAY ITEM SPEC YEAR:	January 2020
SUBMITTAL TYPE:	Engineers Estimate
COUNTY:	Volusia
DATE:	February 21, 2020
ENGINEERING CONSULTANT FIRM:	VHB
CONTACT NAME:	Keith Stimpson
PHONE NUMBER:	407-982-4482
FILE VERSION:	EE_07-22_Rev26
PAGE NUMBER:	1 of 1

COMPONENT GROUPS

100 - STRUCTURES	*NOT USED*		
200 - ROADWAY			$86,063.64
300 - SIGNING & PAVEMENT MARKINGS			$1,444.77
400 - LIGHTING			$28,962.00
500 - SIGNALIZATION			$28,916.00
550 - ITS	*NOT USED*		
600 - LANDSCAPE / PERIPHERALS	*NOT USED*		
700 - UTILITIES	*NOT USED*		
800 - ARCHITECTURAL	*NOT USED*		
900 - MASS TRANSIT	*NOT USED*		
1000 - INVALID & OTHER ITEMS	*NOT USED*		
	COMPONENT SUB-TOTAL		$145,386.40
(102-1) MOT (Maintenance of Traffic)		10%	$14,538.64
	SUB-TOTAL		$159,925.04
(101-1) MOB (Mobilization)		10%	$15,992.50
	SUB-TOTAL		$175,917.55
PU (Project Unknowns)		10%	$17,591.75
	SUB-TOTAL		$193,509.30
(999-25) Initial Contingency (Do Not Bid)			$4,200.00
	PROJECT GRAND TOTAL		**$197,709.30**

NOTES:ROW cost is not considered.

ENGINEER'S ESTIMATE

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
PAGE NUMBER:	

200-Roadway

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
0101 1	MOBILIZATION	LS	10%	See Summary Sheet	
0102 1	MAINTENANCE OF TRAFFIC	LS	10%	See Summary Sheet	
0999 25	INITIAL CONTINGENCY AMOUNT, DO NOT BID	LS		$4,200.00	
0110 1 1	CLEARING & GRUBBING	AC	0.273	$10,477.67	$2,860.40
0110 4 10	REMOVAL OF EXIST CONC	SY	352	$18.56	$6,533.12
0160 4	TYPE B STABILIZATION	SY	677	$5.00	$3,386.25
0285709	OPTIONAL BASE,BASE GROUP 09	SY	539	$20.40	$10,994.66
0286 1	TURNOUT CONSTRUCT/DRIVEWAY BASE- OPTION	SY	148	$27.63	$4,077.67
0334 1 13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	TN	30	$93.86	$2,782.24
0337 7 82	ASPH CONC FC,TRAFFIC C,FC-9.5,PG 76-22	TN	38	$147.45	$5,567.63
0425 1311	INLETS, CURB, TYPE P-1, <10'	EA	1	$4,885.40	$4,885.40
0425 1321	INLETS, CURB, TYPE P-2, <10'	EA	1	$5,772.27	$5,772.27
0425 2 63	MANHOLES, P-8, PARTIAL	EA	1	$2,847.62	$2,847.62
0430174124	PIPE CULV, OPT MATL, ROUND,24"SD	LF	77	$76.49	$5,889.73
0520 1 10	CONCRETE CURB & GUTTER, TYPE F	LF	491	$24.43	$11,993.06
0520 3	VALLEY GUTTER- CONCRETE	LF	90	$38.79	$3,485.02
0522 1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	SY	215	$40.44	$8,675.06
0522 2	CONCRETE SIDEWALK AND DRIVEWAYS, 6"	SY	65	$56.42	$3,663.06
0522 4	BUS SHELTER PAD- CONCRETE	SY	8	$91.34	$761.17
0527 2	DETECTABLE WARNINGS	SF	32	$31.20	$998.40
0570 1 2	PERFORMANCE TURF, SOD	SY	317	$2.81	$890.87
200-Roadway		**COMPONENT TOTAL**			**$86,063.64**

ENGINEER'S ESTIMATE

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
PAGE NUMBER:	

300-Signing & Pavement Markings

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
0700 1 50	SINGLE POST SIGN, RELOCATE	AS	2	$260.54	$521.08
0706 1 1	RAISED PAVMT MARK, TYPE B W/O FINAL SURF	EA	4	$3.31	$13.24
0710 11101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	GM	0.184	$1,010.31	$186.37
0710 11123	PAINTED PAVT MARK,STD,WHITE,SOLID, 12"	LF	346	$0.87	$301.02
0710 11125	PAINTED PAVT MARK,STD,WHITE,SOLID,24"	LF	226	$1.31	$296.06
0710 11170	PAINTED PAVT MARK,STD,WHITE, ARROWS	EA	4	$31.75	$127.00
300-Signing & Pavement Markings		**COMPONENT TOTAL**			**$1,444.77**

ENGINEER'S ESTIMATE
FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
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400-Lighting

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
0630 2 12	CONDUIT, F& I, DIRECTIONAL BORE	LF	200	$20.31	$4,062.00
0715 1 12	LIGHTING CONDUCTORS, F&I, INSUL,NO.8-6	LF	600	$1.50	$900.00
0715 4 12	LIGHT POLE COMPLETE, F&I- STD, 35'	EA	4	$5,200.00	$20,800.00
0715 5 31	LUMINAIRE & BRACKET ARM, F&I NEW	EA	2	$1,600.00	$3,200.00
400-Lighting		**COMPONENT TOTAL**			**$28,962.00**

ENGINEER'S ESTIMATE

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
PAGE NUMBER:	

500-Signalization

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
0630 2 12	CONDUIT, F& I, DIRECTIONAL BORE	LF	200	$20.31	$4,062.00
0632 7 1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	PI	1	$5,000.00	$5,000.00
0634 4152	SPAN WIRE ASSEMBLY, F&I, TWO PT, DIAG	PI	1	$2,820.00	$2,820.00
0650 1 14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	AS	2	$950.00	$1,900.00
0653 1 11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	AS	1	$690.00	$690.00
0646 1 11	ALUMINUM SIGNALS POLE, PEDESTAL	EA	1	$1,460.00	$1,460.00
0635 2 11	PULL & SPLICE BOX, F&I, 13" x 24"	EA	1	$745.00	$745.00
0670 5400	TRAF CNTL ASSEM, MODIFY	AS	1	$1,800.00	$1,800.00
0641 2 17	PREST CNC POLE,F&I,TYP P-VII	EA	1	$9,856.00	$9,856.00
0641 2 60	PREST CNC POLE, REMOVE	EA	1	$583.00	$583.00

500-Signalization	**COMPONENT TOTAL**	**$28,916.00**

ENGINEER'S ESTIMATE

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID # :	111111-1-11-11
PROJECT DESCRIPTION:	Clyde Morris Boulevard at Madeline Avenue Northbound Right Turn Lane Improvements
PAY ITEM SPEC YEAR:	January 2020
SUBMITTAL TYPE:	Engineers Estimate
COUNTY:	Volusia
DATE:	February 21, 2020
ENGINEERING CONSULTANT FIRM:	VHB
CONTACT NAME:	Keith Stimpson
PHONE NUMBER:	407-982-4482
FILE VERSION:	EE_07-22_Rev26
PAGE NUMBER:	1 of 1

COMPONENT GROUPS

100 - STRUCTURES	*NOT USED*		
200 - ROADWAY			$62,688.71
300 - SIGNING & PAVEMENT MARKINGS			$634.77
400 - LIGHTING	*NOT USED*		
500 - SIGNALIZATION			$30,916.00
550 - ITS	*NOT USED*		
600 - LANDSCAPE / PERIPHERALS	*NOT USED*		
700 - UTILITIES	*NOT USED*		
800 - ARCHITECTURAL	*NOT USED*		
900 - MASS TRANSIT	*NOT USED*		
1000 - INVALID & OTHER ITEMS	*NOT USED*		
	COMPONENT SUB-TOTAL		$94,239.48
(102-1) MOT (Maintenance of Traffic)		10%	$9,423.95
	SUB-TOTAL		$103,663.43
(101-1) MOB (Mobilization)		10%	$10,366.34
	SUB-TOTAL		$114,029.77
PU (Project Unknowns)		10%	$11,402.98
	SUB-TOTAL		$125,432.75
(999-25) Initial Contingency (Do Not Bid)			$4,200.00
	PROJECT GRAND TOTAL		**$129,632.75**

NOTES:ROW cost is not considered.

ENGINEER'S ESTIMATE

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
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200-Roadway

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
0101 1	MOBILIZATION	LS	10%	See Summary Sheet	
0102 1	MAINTENANCE OF TRAFFIC	LS	10%	See Summary Sheet	
0999 25	INITIAL CONTINGENCY AMOUNT, DO NOT BID	LS		$4,200.00	
0110 1 1	CLEARING & GRUBBING	AC	0.2640	$10,477.67	$2,766.10
0110 4 10	REMOVAL OF EXIST CONC	SY	320	$18.56	$5,939.20
0160 4	TYPE B STABILIZATION	SY	656	$5.00	$3,280.00
0285709	OPTIONAL BASE,BASE GROUP 09	SY	438	$20.40	$8,935.20
0286 1	TURNOUT CONSTRUCT/DRIVEWAY BASE- OPTION	SY	116	$27.63	$3,205.08
0334 1 13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	TN	24	$93.86	$2,252.64
0337 7 82	ASPH CONC FC,TRAFFIC C,FC-9.5,PG 76-22	TN	31	$147.45	$4,570.95
0425 1321	INLETS, CURB, TYPE P-2, <10'	EA	1	$5,772.27	$5,772.27
0425 2 63	MANHOLES, P-8, PARTIAL	EA	1	$2,847.62	$2,847.62
0430174124	PIPE CULV, OPT MATL, ROUND,24"SD	LF	5	$76.49	$382.45
0520 1 10	CONCRETE CURB & GUTTER, TYPE F	LF	392	$24.43	$9,576.56
0522 1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	SY	114	$40.44	$4,610.16
0522 2	CONCRETE SIDEWALK AND DRIVEWAYS, 6"	SY	57	$56.42	$3,215.94
0522 4	BUS SHELTER PAD- CONCRETE	SY	37	$91.34	$3,379.58
0527 2	DETECTABLE WARNINGS	SF	36	$31.20	$1,123.20
0570 1 2	PERFORMANCE TURF, SOD	SY	296	$2.81	$831.76
200-Roadway		**COMPONENT TOTAL**			**$62,688.71**

ENGINEER'S ESTIMATE

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
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300-Signing & Pavement Markings

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
0700 1 50	SINGLE POST SIGN, RELOCATE	AS	1	$260.54	$260.54
0706 1 1	RAISED PAVMT MARK, TYPE B W/O FINAL SURF	EA	4	$3.31	$13.24
0710 11101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	GM	0.059	$1,010.31	$59.32
0710 11123	PAINTED PAVT MARK,STD,WHITE,SOLID, 12"	LF	168	$0.87	$146.16
0710 11125	PAINTED PAVT MARK,STD,WHITE,SOLID,24"	LF	46	$1.31	$60.26
0710 11170	PAINTED PAVT MARK,STD,WHITE, ARROWS	EA	3	$31.75	$95.25
300-Signing & Pavement Markings		**COMPONENT TOTAL**			**$634.77**

ENGINEER'S ESTIMATE
FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
PAGE NUMBER:	

400-Lighting

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
400-Lighting		**COMPONENT TOTAL**			

ENGINEER'S ESTIMATE
FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
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500-Signalization

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
0630 2 12	CONDUIT, F& I, DIRECTIONAL BORE	LF	200	$20.31	$4,062.00
0632 7 1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	PI	1	$5,000.00	$5,000.00
0634 4152	SPAN WIRE ASSEMBLY, F&I, TWO PT, DIAG	PI	1	$2,820.00	$2,820.00
0635 2 11	PULL & SPLICE BOX, F&I, 13" x 24"	EA	1	$745.00	$745.00
0641 2 17	PREST CNC POLE,F&I,TYP P-VII	EA	1	$9,856.00	$9,856.00
0641 2 60	PREST CNC POLE, REMOVE	EA	1	$583.00	$583.00
0646 1 11	ALUMINUM SIGNALS POLE, PEDESTAL	EA	1	$1,460.00	$1,460.00
0650 1 14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	AS	6	$950.00	$5,700.00
0653 1 11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	AS	1	$690.00	$690.00
500-Signalization			**COMPONENT TOTAL**		**$30,916.00**

ENGINEER'S ESTIMATE

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID # :	111111-1-11-11
PROJECT DESCRIPTION:	Clyde Morris Boulevard at Madeline Avenue Southbound Right Turn Lane Improvements
PAY ITEM SPEC YEAR:	January 2020
SUBMITTAL TYPE:	Engineers Estimate
COUNTY:	Volusia
DATE:	February 21, 2020
ENGINEERING CONSULTANT FIRM:	VHB
CONTACT NAME:	Keith Stimpson
PHONE NUMBER:	407-982-4482
FILE VERSION:	EE_07-22_Rev26
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COMPONENT GROUPS

100 - STRUCTURES	*NOT USED*		
200 - ROADWAY			$75,470.46
300 - SIGNING & PAVEMENT MARKINGS			$995.70
400 - LIGHTING			$26,243.00
500 - SIGNALIZATION			$32,716.00
550 - ITS	*NOT USED*		
600 - LANDSCAPE / PERIPHERALS	*NOT USED*		
700 - UTILITIES	*NOT USED*		
800 - ARCHITECTURAL	*NOT USED*		
900 - MASS TRANSIT	*NOT USED*		
1000 - INVALID & OTHER ITEMS	*NOT USED*		
	COMPONENT SUB-TOTAL		$135,425.16
(102-1) MOT (Maintenance of Traffic)		10%	$13,542.52
	SUB-TOTAL		$148,967.68
(101-1) MOB (Mobilization)		10%	$14,896.77
	SUB-TOTAL		$163,864.45
PU (Project Unknowns)		10%	$16,386.44
	SUB-TOTAL		$180,250.89
(999-25) Initial Contingency (Do Not Bid)			$4,200.00
	PROJECT GRAND TOTAL		**$184,450.89**

NOTES:ROW cost is not considered.

ENGINEER'S ESTIMATE

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
PAGE NUMBER:	

200-Roadway

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
0101 1	MOBILIZATION	LS	10%	See Summary Sheet	
0102 1	MAINTENANCE OF TRAFFIC	LS	10%	See Summary Sheet	
0999 25	INITIAL CONTINGENCY AMOUNT, DO NOT BID	LS		$4,200.00	
0110 1 1	CLEARING & GRUBBING	AC	0.379	$10,477.67	$3,965.80
0110 4 10	REMOVAL OF EXIST CONC	SY	326	$18.56	$6,050.56
0160 4	TYPE B STABILIZATION	SY	583	$5.00	$2,913.87
0285709	OPTIONAL BASE,BASE GROUP 09	SY	469	$20.40	$9,575.68
0286 1	TURNOUT CONSTRUCT/DRIVEWAY BASE- OPTION	SY		$27.63	
0334 1 13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	TN	26	$93.86	$2,423.16
0337 7 82	ASPH CONC FC,TRAFFIC C,FC-9.5,PG 76-22	TN	26	$147.45	$3,806.68
0425 1311	INLETS, CURB, TYPE P-1, <10'	EA	2	$4,885.40	$9,770.80
0425 1321	INLETS, CURB, TYPE P-2, <10'	EA		$5,772.27	
0425 2 63	MANHOLES, P-8, PARTIAL	EA	2	$2,847.62	$5,695.24
0430174124	PIPE CULV, OPT MATL, ROUND,24"SD	LF	10	$76.49	$764.90
0520 1 10	CONCRETE CURB & GUTTER, TYPE F	LF	438	$24.43	$10,689.05
0520 3	VALLEY GUTTER- CONCRETE	LF		$38.79	
0522 1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	SY	301	$40.44	$12,169.61
0522 2	CONCRETE SIDEWALK AND DRIVEWAYS, 6"	SY	80	$56.42	$4,493.44
0522 4	BUS SHELTER PAD- CONCRETE	SY		$91.34	
0527 2	DETECTABLE WARNINGS	SF	16	$31.20	$499.20
0570 1 2	PERFORMANCE TURF, SOD	SY	944	$2.81	$2,652.47
200-Roadway		**COMPONENT TOTAL**			**$75,470.46**

ENGINEER'S ESTIMATE

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
PAGE NUMBER:	

300-Signing & Pavement Markings

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
0700 1 50	SINGLE POST SIGN, RELOCATE	AS		$260.54	
0706 1 1	RAISED PAVMT MARK, TYPE B W/O FINAL SURF	EA	5	$3.31	$16.55
0710 11101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	GM	0.166	$1,010.31	$167.95
0710 11123	PAINTED PAVT MARK,STD,WHITE,SOLID, 12"	LF	410	$0.87	$356.70
0710 11125	PAINTED PAVT MARK,STD,WHITE,SOLID,24"	LF	250	$1.31	$327.50
0710 11170	PAINTED PAVT MARK,STD,WHITE, ARROWS	EA	4	$31.75	$127.00
300-Signing & Pavement Markings			**COMPONENT TOTAL**		**$995.70**

ENGINEER'S ESTIMATE
FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
PAGE NUMBER:	

400-Lighting

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
0630 2 12	CONDUIT, F& I, DIRECTIONAL BORE	LF	300	$20.31	$6,093.00
0715 1 12	LIGHTING CONDUCTORS, F&I, INSUL,NO.8-6	LF	900	$1.50	$1,350.00
0715 4 12	LIGHT POLE COMPLETE, F&I- STD, 35'	EA	3	$5,200.00	$15,600.00
0715 5 31	LUMINAIRE & BRACKET ARM, F&I NEW	EA	2	$1,600.00	$3,200.00
400-Lighting			**COMPONENT TOTAL**		**$26,243.00**

ENGINEER'S ESTIMATE

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
PAGE NUMBER:	

500-Signalization

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
0630 2 12	CONDUIT, F& I, DIRECTIONAL BORE	LF	200	$20.31	$4,062.00
0632 7 1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	PI	1	$5,000.00	$5,000.00
0634 4152	SPAN WIRE ASSEMBLY, F&I, TWO PT, DIAG	PI	1	$2,820.00	$2,820.00
0635 2 11	PULL & SPLICE BOX, F&I, 13" x 24"	EA	1	$745.00	$745.00
0641 2 17	PREST CNC POLE,F&I,TYP P-VII	EA	1	$9,856.00	$9,856.00
0641 2 60	PREST CNC POLE, REMOVE	EA	1	$583.00	$583.00
0646 1 11	ALUMINUM SIGNALS POLE, PEDESTAL	EA	1	$1,460.00	$1,460.00
0650 1 14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	AS	6	$950.00	$5,700.00
0653 1 11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	AS	1	$690.00	$690.00
0670 5400	TRAF CNTL ASSEM, MODIFY	AS	1	$1,800.00	$1,800.00
500-Signalization		**COMPONENT TOTAL**			**$32,716.00**

ENGINEER'S ESTIMATE

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID # :	111111-1-11-11
PROJECT DESCRIPTION:	Clyde Morris Boulevard at Willow Run Boulevard Southbound Right Turn Lane Improvements
PAY ITEM SPEC YEAR:	January 2020
SUBMITTAL TYPE:	Engineers Estimate
COUNTY:	Volusia
DATE:	February 21, 2020
ENGINEERING CONSULTANT FIRM:	VHB
CONTACT NAME:	Keith Stimpson
PHONE NUMBER:	407-982-4482
FILE VERSION:	EE_07-22_Rev26
PAGE NUMBER:	1 of 1

COMPONENT GROUPS

100 - STRUCTURES	*NOT USED*		
200 - ROADWAY			$68,197.10
300 - SIGNING & PAVEMENT MARKINGS			$1,856.94
400 - LIGHTING			$35,524.00
500 - SIGNALIZATION			$9,557.00
550 - ITS	*NOT USED*		
600 - LANDSCAPE / PERIPHERALS	*NOT USED*		
700 - UTILITIES	*NOT USED*		
800 - ARCHITECTURAL	*NOT USED*		
900 - MASS TRANSIT	*NOT USED*		
1000 - INVALID & OTHER ITEMS	*NOT USED*		
	COMPONENT SUB-TOTAL		$115,135.04
(102-1) MOT (Maintenance of Traffic)		10%	$11,513.50
	SUB-TOTAL		$126,648.54
(101-1) MOB (Mobilization)		10%	$12,664.85
	SUB-TOTAL		$139,313.39
PU (Project Unknowns)		10%	$13,931.34
	SUB-TOTAL		$153,244.73
(999-25) Initial Contingency (Do Not Bid)			$4,200.00
	PROJECT GRAND TOTAL		**$157,444.73**

NOTES:ROW cost is not considered.

ENGINEER'S ESTIMATE

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
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200-Roadway

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
0101 1	MOBILIZATION	LS	10%	See Summary Sheet	
0102 1	MAINTENANCE OF TRAFFIC	LS	10%	See Summary Sheet	
0999 25	INITIAL CONTINGENCY AMOUNT, DO NOT BID	LS		$4,200.00	
0110 1 1	CLEARING & GRUBBING	AC	0.263	$10,477.67	$2,758.77
0110 4 10	REMOVAL OF EXIST CONC	SY	358	$18.56	$6,644.48
0160 4	TYPE B STABILIZATION	SY	655	$5.00	$3,273.15
0285709	OPTIONAL BASE,BASE GROUP 09	SY	528	$20.40	$10,774.81
0286 1	TURNOUT CONSTRUCT/DRIVEWAY BASE- OPTION	SY	80	$27.63	$2,221.30
0334 1 13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	TN	29	$93.86	$2,726.61
0337 7 82	ASPH CONC FC,TRAFFIC C,FC-9.5,PG 76-22	TN	33	$147.45	$4,935.36
0425 1311	INLETS, CURB, TYPE P-1, <10'	EA	1	$4,885.40	$4,885.40
0425 1321	INLETS, CURB, TYPE P-2, <10'	EA		$5,772.27	
0425 2 63	MANHOLES, P-8, PARTIAL	EA	2	$2,847.62	$5,695.24
0430174124	PIPE CULV, OPT MATL, ROUND,24"SD	LF	9	$76.49	$688.41
0520 1 10	CONCRETE CURB & GUTTER, TYPE F	LF	488	$24.43	$11,928.66
0520 3	VALLEY GUTTER- CONCRETE	LF		$38.79	
0522 1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	SY	236	$40.44	$9,525.85
0522 2	CONCRETE SIDEWALK AND DRIVEWAYS, 6"	SY	7	$56.42	$409.06
0522 4	BUS SHELTER PAD- CONCRETE	SY		$91.34	
0527 2	DETECTABLE WARNINGS	SF	25	$31.20	$780.00
0570 1 2	PERFORMANCE TURF, SOD	SY	338	$2.81	$950.00
200-Roadway		**COMPONENT TOTAL**			**$68,197.10**

ENGINEER'S ESTIMATE

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
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300-Signing & Pavement Markings

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
0700 1 50	SINGLE POST SIGN, RELOCATE	AS	4	$260.54	$1,042.16
0706 1 1	RAISED PAVMT MARK, TYPE B W/O FINAL SURF	EA	4	$3.31	$13.24
0710 11101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	GM	0.186	$1,010.31	$188.08
0710 11123	PAINTED PAVT MARK,STD,WHITE,SOLID, 12"	LF	258	$0.87	$224.46
0710 11125	PAINTED PAVT MARK,STD,WHITE,SOLID,24"	LF	200	$1.31	$262.00
0710 11170	PAINTED PAVT MARK,STD,WHITE, ARROWS	EA	4	$31.75	$127.00
300-Signing & Pavement Markings		**COMPONENT TOTAL**			**$1,856.94**

ENGINEER'S ESTIMATE
FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
PAGE NUMBER:	

400-Lighting

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
0630 2 12	CONDUIT, F& I, DIRECTIONAL BORE	LF	400	$20.31	$8,124.00
0715 1 12	LIGHTING CONDUCTORS, F&I, INSUL,NO.8-6	LF	1200	$1.50	$1,800.00
0715 4 12	LIGHT POLE COMPLETE, F&I- STD, 35'	EA	4	$5,200.00	$20,800.00
0715 5 31	LUMINAIRE & BRACKET ARM, F&I NEW	EA	3	$1,600.00	$4,800.00
400-Lighting			**COMPONENT TOTAL**		**$35,524.00**

ENGINEER'S ESTIMATE
FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5

FINANCIAL PROJECT ID:	111111-1-11-11
FILE VERSION:	EE_07-22_Rev26
PAGE NUMBER:	

500-Signalization

PAY ITEM #	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
0630 2 12	CONDUIT, F& I, DIRECTIONAL BORE	LF	200	$20.31	$4,062.00
0632 7 2	SIGNAL CABLE, REPAIR/REPL-FUR & INSTALL	LF	200	$4.00	$800.00
0635 2 11	PULL & SPLICE BOX, F&I, 13" x 24"	EA	1	$745.00	$745.00
0646 1 11	ALUMINUM SIGNALS POLE, PEDESTAL	EA	1	$1,460.00	$1,460.00
0653 1 11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	AS	1	$690.00	$690.00
0670 5400	TRAF CNTL ASSEM, MODIFY	AS	1	$1,800.00	$1,800.00
500-Signalization		**COMPONENT TOTAL**			**$9,557.00**

CMF / CRF Details

CMF ID: 285

Provide a right-turn lane on one major-road approach

Description:

Prior Condition: ***No Prior Condition(s)***

Category: Intersection geometry

Study: ***Safety Effectiveness of Intersection Left- and Right-Turn Lanes*****, Harwood et al., 2002**

Star Quality Rating:	★★★★☆

Crash Modification Factor (CMF)	
Value:	0.86
Adjusted Standard Error:	0.06
Unadjusted Standard Error:	0.05

Crash Reduction Factor (CRF)	
Value:	14 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	6

Unadjusted Standard Error:	5

Applicability

Crash Type:	All
Crash Severity:	All
Roadway Types:	Not Specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	All
Traffic Volume:	
Time of Day:	

If countermeasure is intersection-based

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	3-leg,4-leg
Traffic Control:	Stop-controlled
Major Road Traffic Volume:	1500 to 40600 Average Daily Traffic (ADT)
Minor Road Traffic Volume:	25 to 26000 Average Daily Traffic (ADT)

Development Details

Date Range of Data Used:	
Municipality:	
State:	

Country:	
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	Yes. HSM lists this CMF in **bold** font to indicate that it has the highest reliability since it has an adjusted standard error of 0.1 or less.
Date Added to Clearinghouse:	Dec-01-2009
Comments:	Countermeasure name changed to match HSM

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CMF / CRF Details

CMF ID: 289

Provide a right-turn lane on both major-road approaches

Description:

Prior Condition: ***No Prior Condition(s)***

Category: Intersection geometry

Study: ***Safety Effectiveness of Intersection Left- and Right-Turn Lanes*****, Harwood et al., 2002**

Star Quality Rating:	★★★★☆

Crash Modification Factor (CMF)	
Value:	0.74
Adjusted Standard Error:	0.08
Unadjusted Standard Error:	0.07

Crash Reduction Factor (CRF)	
Value:	26 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	8

Unadjusted Standard Error:	7

Applicability

Crash Type:	All
Crash Severity:	All
Roadway Types:	Not Specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	All
Traffic Volume:	
Time of Day:	

If countermeasure is intersection-based

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	Not Specified
Traffic Control:	Stop-controlled
Major Road Traffic Volume:	1500 to 40600 Average Daily Traffic (ADT)
Minor Road Traffic Volume:	25 to 26000 Average Daily Traffic (ADT)

Development Details

Date Range of Data Used:	
Municipality:	
State:	

Country:	
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	Yes. HSM lists this CMF in **bold** font to indicate that it has the highest reliability since it has an adjusted standard error of 0.1 or less.
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