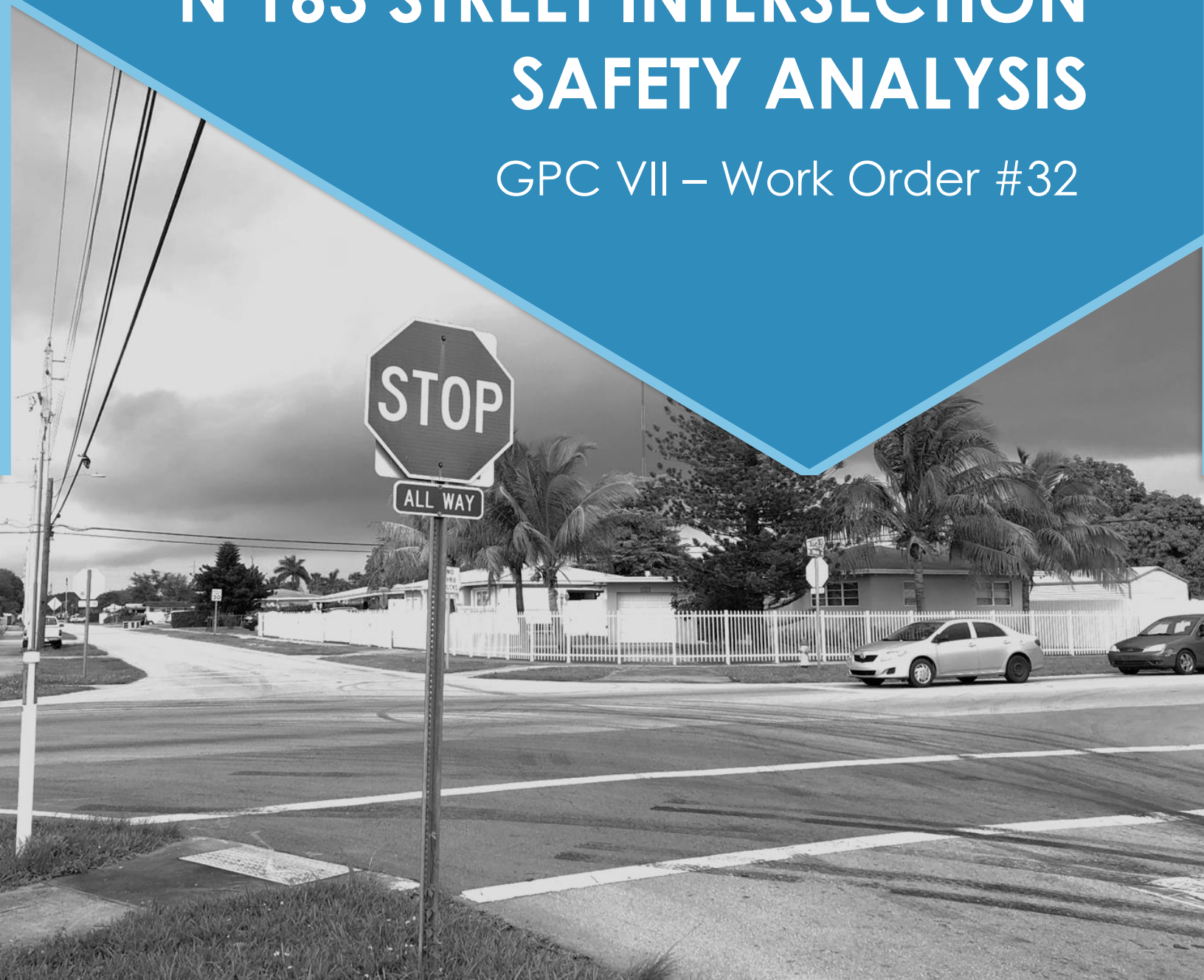


N MIAMI AVENUE AND N 163 STREET INTERSECTION SAFETY ANALYSIS

GPC VII – Work Order #32



Miami-Dade Transportation
Planning Organization



August 2021

N MIAMI AVENUE AND N 163 STREET INTERSECTION SAFETY ANALYSIS GPC VIII – Work Order #32

August 5, 2021

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PROJECT OVERVIEW

On March 18, 2021, the Miami-Dade Transportation Planning Organization (TPO) Governing Board adopted resolution #12-2021 ratifying the issuance of notice to proceed for the scope of services and budget to conduct a safety analysis for Miami-Dade County safety improvements projects. The TPO is advancing three intersections identified in the TPO's adopted Fiscal Year 2026 List of Program Priorities (LOPP) and prioritized by the Miami-Dade Department of Transportation and Public Works (DTPW) for Safety Program funding. These locations are considered off-system since they are not located on the State Highway System (SHS).

This report addresses one of the selected projects submitted to the Florida Department of Transportation (FDOT) District Six Safety Program for off-system facilities funding.

An Intersection Safety Analysis was conducted at North (N) Miami Avenue and North (N) 163 Street, located in unincorporated Miami-Dade County. The intersection was identified as a roadway safety improvement project under the TPO Fiscal Year 2026 LOPP approved June 18, 2020 and included in the newly approved 2027 LOPP on June 17, 2021. Miami-Dade DTPW prioritized improvements for this intersection due to an existing pattern of angle and left turn crashes.

The study's Purpose & Need is to reduce crashes, most importantly fatalities and serious injuries, by evaluating the intersection and providing justification to apply for Highway Safety Improvement Program (HSIP) funding. The HSIP is a data driven program. As such, proposed projects need to meet eligibility requirements through crash and operational analysis and must demonstrate a benefit-cost ratio a (B/C) greater than 1 and a positive net present value (NPV). The study analysis, results, and proposed improvements will be presented to the Florida Department of Transportation (FDOT) District Six for evaluation of eligibility and prioritization based on the analysis results.

N Miami Avenue and N 163 Street is a two-way stop-controlled (TWSC) intersection with the east/west approaches operating as stop-controlled. N Miami Avenue and N 163 Street are two-lane roads with each approach consisting of a single shared left/through/right lane.

This report documents the findings of field observations, data collection, crash data analysis, and detailed traffic operations analysis conducted at the study intersection to evaluate the existing safety and operational issues. This report provides a concept for consideration and opinion of probable cost for the implementation of the suggested improvements. In addition, a benefit-cost comparison is provided to determine the project eligibility for HSIP funding ($B/C > 1$ and $+ NPV$). The findings have been reviewed by Miami-Dade DTPW and FDOT. FDOT's Electronic Review Comments (ERC) and the response to comments are provided in **Appendix K**.

EXISTING CONDITIONS

A field review was conducted at the study intersection to document existing roadway and safety conditions, as well as traffic operations. Within the study limits, N Miami Avenue is a north-south, two-lane undivided roadway, classified as *Urban Minor Arterial* with 11-foot lanes and a posted speed limit of 30 miles per hour (mph) within the vicinity of study intersection. N 163 Street is an east-west, two-lane undivided urban local roadway, with 10-foot lanes and a posted speed limit of 30 mph.

Intersection Geometry

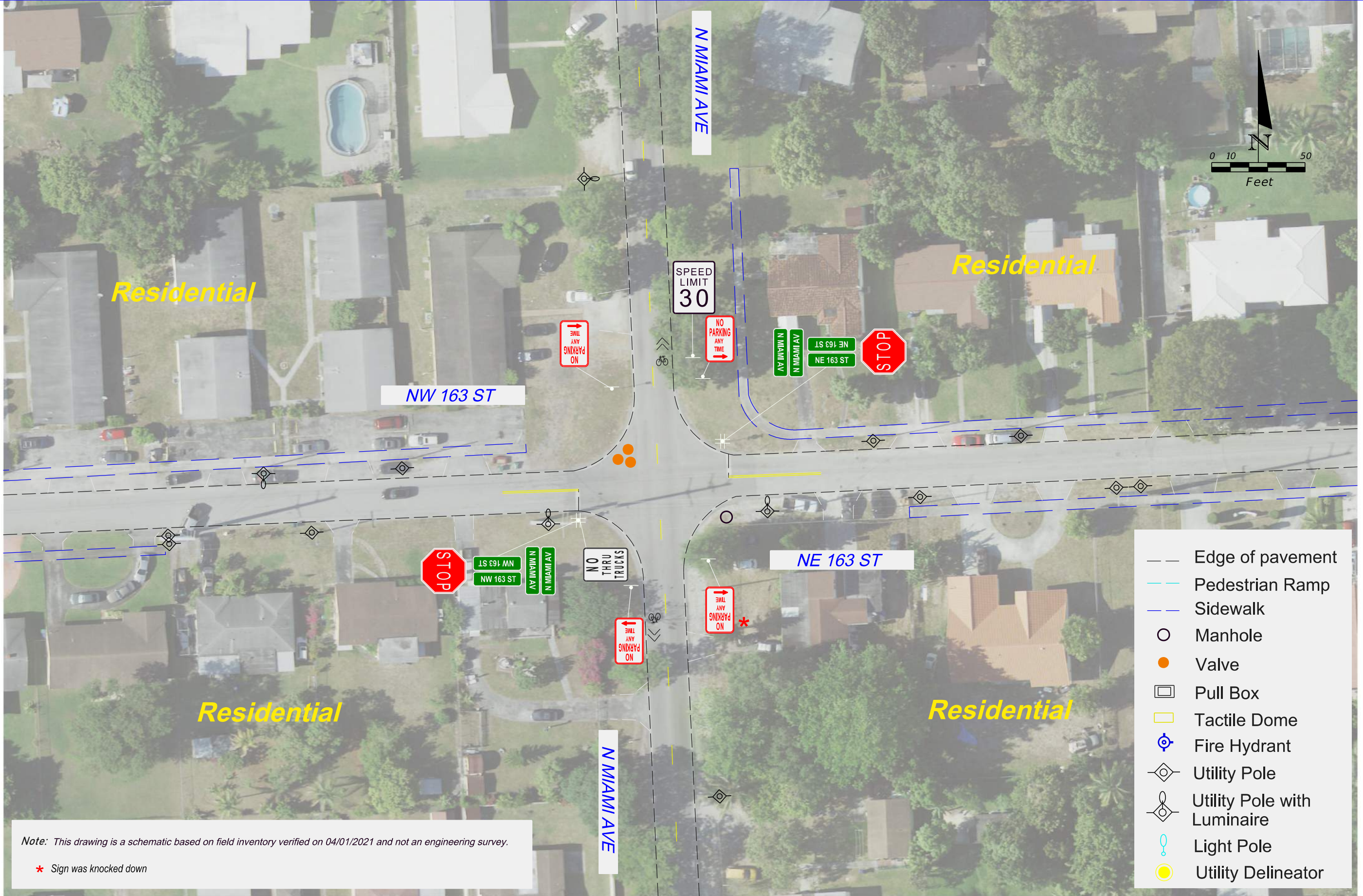
The approach lane configuration for each of the four (4) intersection legs consists of a single shared left/through/right lane.

Sidewalk presence is inconsistent in the vicinity of the study intersection. Sidewalk is present along the north side of the west leg and ends approximately 50 feet west of the intersection, and sidewalk is present on the south side of the east leg and ends approximately 110 feet east of the intersection. There is no sidewalk along N Miami Avenue except for the north leg, on the east side where there is a sidewalk stretch of approximately 140 feet. There are no marked crosswalks at the intersection.

Miami-Dade Transit (MDT) route 2 runs along N Miami Avenue through the intersection. There are stops located on both sides of N Miami Avenue approximately 300 feet north and south of the intersection. N Miami Avenue is marked with "sharrow" pavement markings in the northbound and southbound directions. There were no pedestrians or bicyclists observed at the intersection during the field review. Refer to the turning movement count data under Traffic Data Collection for pedestrian and bicyclist volumes reported during the peak hours. Roadway lighting is present along N 163 Street. The land use surrounding the intersection is single family residential, and the surrounding area near the intersection is built out.

The roadway context classification in the vicinity of the intersection is Urban General (C4).

Figure 1 shows the condition diagram detailing existing field conditions. The diagram shows the intersection and the conditions within the surrounding area including the intersection alignment, residential buildings from aerial, sidewalks, trees, utility poles, lighting poles, water hydrants, stop signs, and lane configuration.



Prepared for:
Miami-Dade Transportation Planning Organization
and
Kittelson & Associates, Inc.

CTS ENGINEERING, INC.
8095 NW 12th STREET,
SUITE 301
DORAL, FL 33126

Miami-Dade
Transportation Planning Organization

EXISTING CONDITION DIAGRAM
N MIAMI AVE & NE 163 ST

FIGURE
NO.

1

Field Observations

A field review was conducted on Friday, March 19, 2021 during the midday period to observe site characteristics, document findings and identify potential intersection improvements to reduce angle and left turn crashes and improve safety overall. The field observation report is provided in **Appendix A**. The following field observations were made:

- The study intersection is located approximately halfway along a 0.5 mile stretch of N Miami Avenue that is uncontrolled in the northbound and southbound directions. This layout provides opportunity for high vehicular speeds as vehicles travel through the residential neighborhood. **Figure 2** illustrates the general setting for N Miami Avenue at the study intersection.

Figure 2: Southbound view of N Miami Avenue and N 163 Street



N Miami Avenue and N 163 Street Intersection Safety Analysis

- Tire skid marks were observed in the middle of the intersection from Google Street View, dated December 2020. See **Figure 3**.

Figure 3: Skid Marks at N Miami Avenue and N 163 Street (northbound view of N Miami Avenue)



Source: Google Earth Street View, December 2020

TRAFFIC DATA COLLECTION

Mechanical Traffic Counts

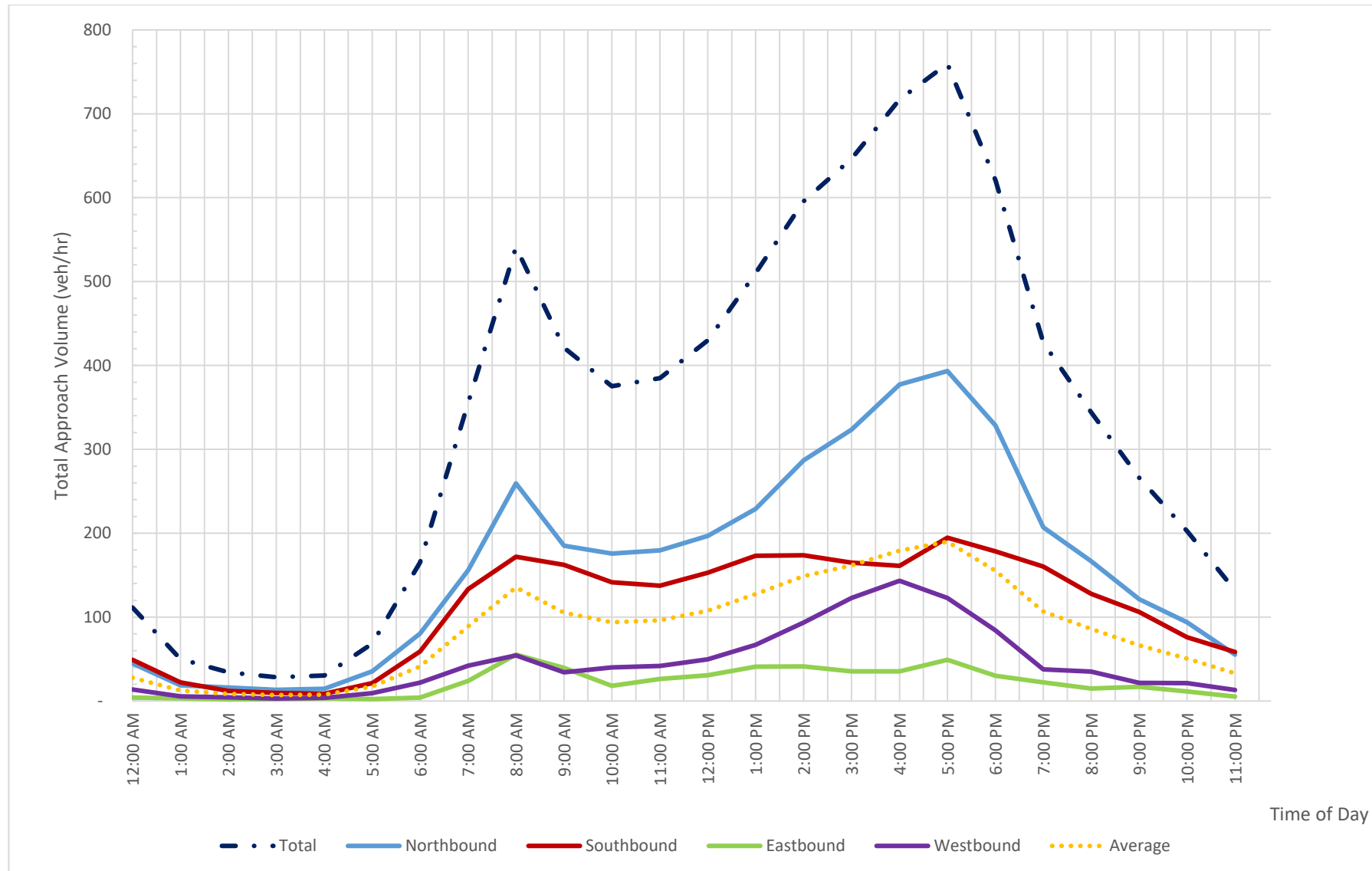
Mechanical traffic counts or bi-directional tube counts were collected on all four approaches of the intersection over a 72-hour period (from Tuesday, March 16, 2021 to Thursday, March 18, 2021). **Figure 4** shows the average variation of hourly traffic volume versus the time of day for a typical weekday (Tuesday, Wednesday, and Thursday).

The eastbound and southbound volumes were observed to have lower variability throughout the day when compared to the northbound and westbound traffic volumes. The 72-hour data yielded the following observations:

- The intersection peak hours are 8:15 AM to 9:15 AM and 5:00 PM to 6:00 PM.
- The northbound approach is the peak traffic direction at the study intersection, and it experiences a peak from 7:45 AM to 9:45 AM and from 4:00 PM to 6:00 PM.

Detailed results of the 72-hour counts are included in **Appendix B**.

Figure 4: 72-hour Average Vehicle Counts



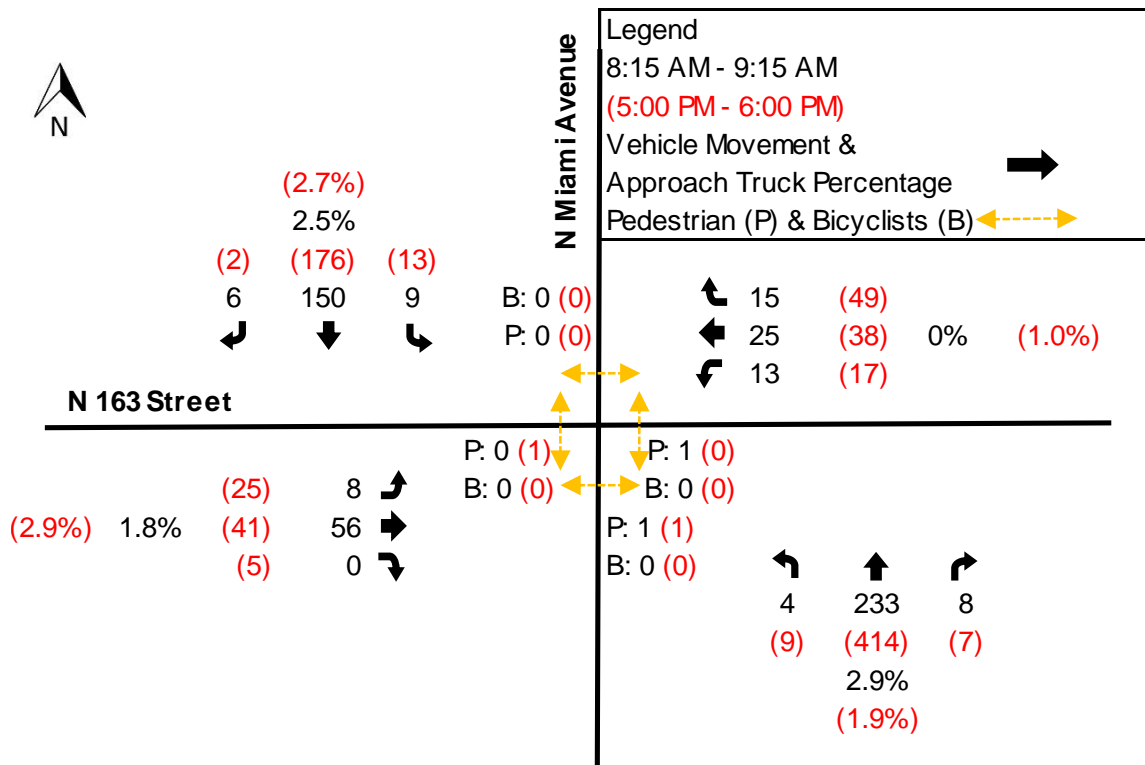
Manual Turning Movement Counts

Video recordings of the intersection turning movements were collected simultaneously during the 72-hour counts. A review of the 72-hour counts helped identify the peak periods to collect four-hour turning movement counts (TMCs). Detailed results of the TMCs are included in **Appendix C**.

Once the peak periods were identified from the 72-hour counts, the video recordings were used to collect and summarize the TMCs at the study intersection. The TMCs were collected on March 17, 2021 from 7:45 AM to 9:45 AM and from 4:00 PM to 6:00 PM. Pedestrian and bicyclist counts were included in the TMCs during the same four hours.

Figure 5 shows the volumes and approach truck percentages for the AM peak hour (8:15 AM to 9:15 AM), PM peak hour (5:00 PM to 6:00 PM) and reported pedestrian / bicyclist crossings.

Figure 5: Turning Movement Counts by Peak Hour



CRASH ANALYSIS

The most current five years of crash data were analyzed for the N Miami Avenue and N 163 Street intersection. The data was obtained from the FDOT's State Safety Office Geographic interface software (SSOGis) and Signal Four Analytics (S4). SSOGis provided verified crash data for 2016-2018 and data from S4 was used to supplement the SSOGis for 2016-2020. The supplement of S4 data was included in the analysis to verify if crash trends and crash patterns continued in the most recent years.

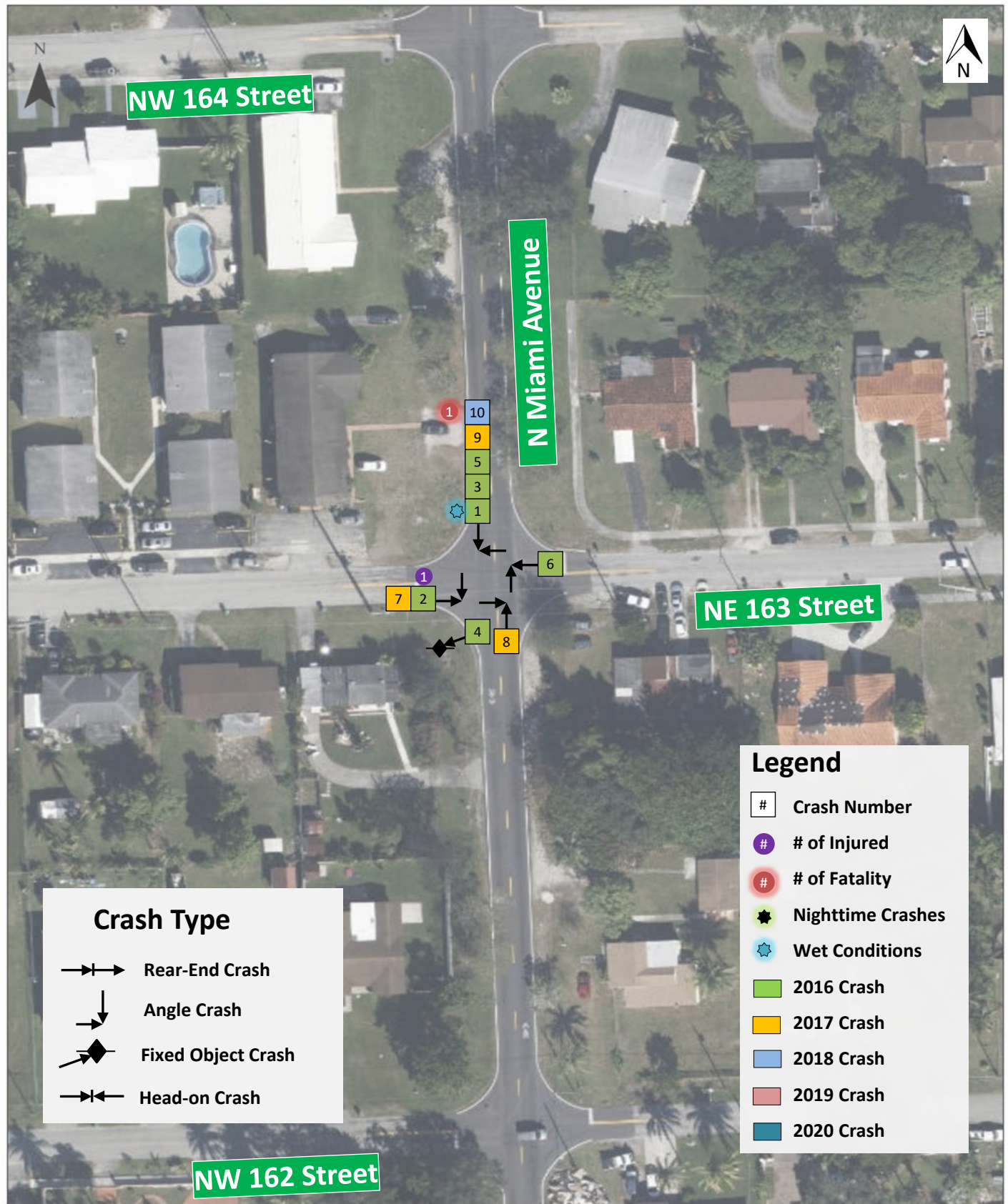
Note that while S4 data is not verified in its raw format, the data for this study was manually verified through a detailed review of the police reports.

The following findings were observed during the five-year analysis:

- A total of 27 crashes were reported within the influence area of the study intersection: six crashes in 2016, five crashes in 2017, five crashes in 2018, six crashes in 2019, and five crashes in 2020.
- The crash peak period (3:00-6:00 PM) coincides with the PM vehicular peak hour identified through traffic data collection.
- Angle (23 crashes / 85 percent) was the highest frequency crash type within the study area.
 - Nine of the 23 angle crashes involved westbound vehicles colliding with southbound vehicles. The westbound approach is stop controlled.
 - Seven of the 23 angle crashes involved eastbound vehicles colliding with southbound vehicles. The eastbound approach is stop controlled.
 - Four of the 23 angle crashes involved westbound vehicles colliding with northbound vehicles. The westbound approach is stop controlled.
 - Three of the 23 angle crashes involved eastbound vehicles colliding with northbound vehicles. The eastbound approach is stop controlled.
 - Five or more angle crashes occurred within three separate 12-month periods. Five angle crashes occurred during 2016, 2017, and 2020.
- One fatal crash was reported in 2018 (4 percent). The fatal crash was an angle crash involving a westbound vehicle and a southbound vehicle. The crash occurred during daylight under dry pavement conditions. Aside from the fatality, 6 people were injured in this crash.
- Seven injury crashes were reported (26 percent). All seven injury crashes were angle crashes with three of these reported in 2020.
- Rear-end and fixed object reported one crash each and head-on reported two crashes during the study period. All four crashes were property damage only.
- There were no reported pedestrian or bicycle crashes within the study area.
- Three crashes (11 percent) occurred under nighttime conditions (dusk, dawn, or dark).
- Two crashes (seven percent) occurred under wet pavement conditions.

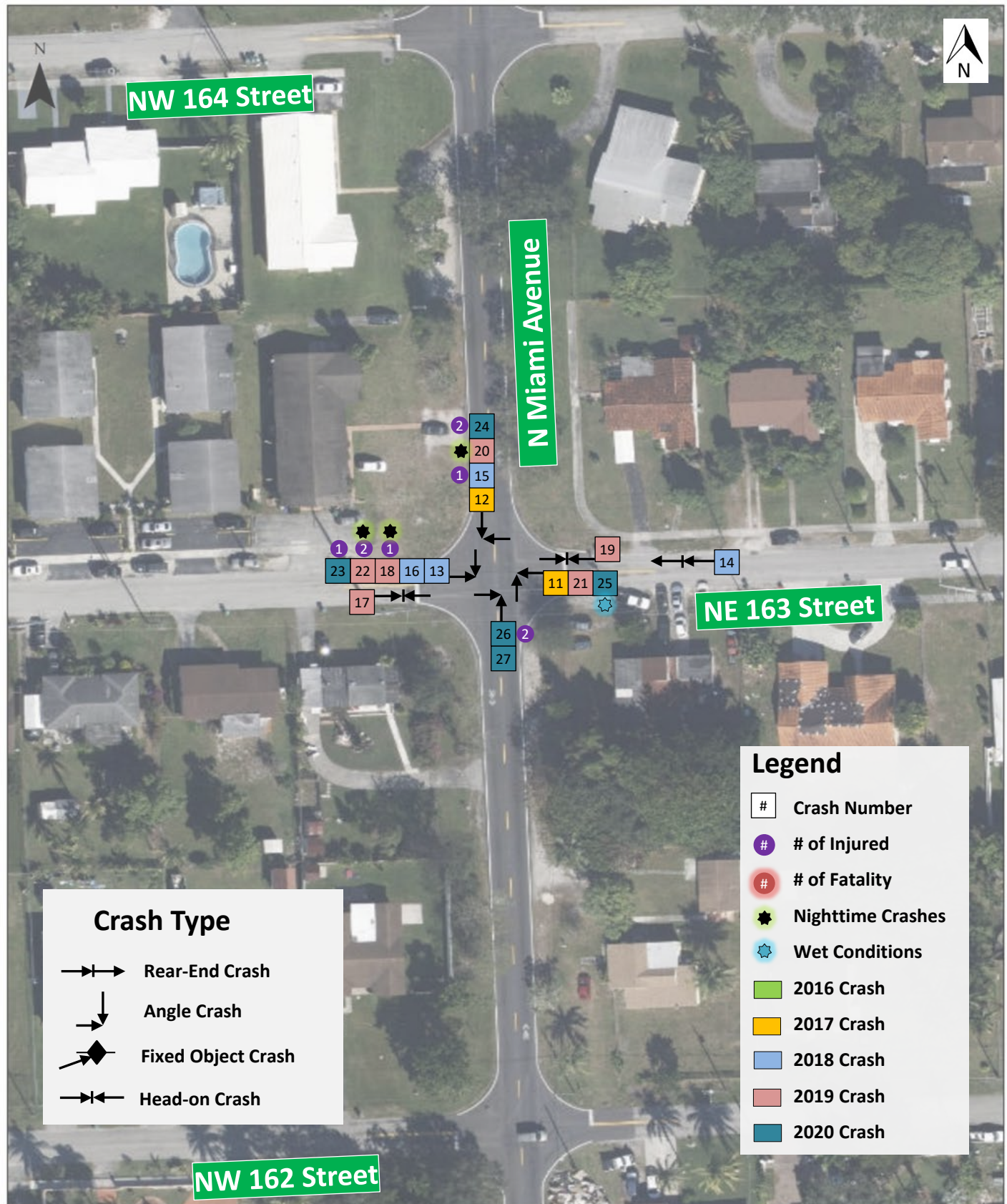
All years of crash data were reviewed to identify trends and potential indicators of a need to change the control type at the study intersection. A SSOGis collision diagram for the crashes during the study period (2016 – 2018) is provided in **Figure 6**. **Figure 7** presents the collision diagram for crash data obtained from S4.

A summary of the crash data is provided in **Appendix D**.



Collision Diagram at N Miami Avenue N 163 Street
(Source: SSOGIS 2016 – 2018)

Figure
6



Collision Diagram at N Miami Avenue N 163 Street
(Source: S4 2016-2020)

Figure

7

A safety performance evaluation was conducted for the existing intersection configuration of two-way stop-controlled (TWSC) using FDOT's Safety Performance for Intersection Control Evaluation (SPICE) tool. The number of design year 2045 predicted, observed, and expected crashes per year are displayed in **Table 1**.

The number of observed crashes per year represents the average number of crashes per year based on the collected 2016-2018 historical crash data. Calibrated Safety Performance Functions (SPFs) were used to determine the number of predicted crashes per year based on the existing intersection control type. SPFs are developed to analyze locations with similar characteristics including intersection control type and can be applied to state, county, and local roadways. The number of expected crashes per year is developed using empirical Bayes method which applies a weighting factor to the predicted number of crashes based on the observed historical crash data.

The observed crashes per year represents the number of crashes that occurred. The predicted crashes per year represents the number of crashes that are generally predicted to occur based on the intersection control type. The expected crashes per year represents the number of crashes that would be expected based on the intersection control type and historical crash data.

Per the results obtained, the number of crashes observed is higher when compared to the predicted number of crashes for the existing intersection control type (TWSC).

Table 1: Existing Control Type (TWSC) Year 2045 Predicted, Observed, and Expected Crashes Per Year

Crash Severity	Predicted Crashes/Year	Observed Crashes/Year	Expected Crashes/Year	Potential for Safety Improvements /Year
Property Damage Only	1.92	3.80	3.30	1.38
Fatal and Injury	1.18	1.60	1.33	0.15
Total	3.10	5.40	4.63	1.53

The existing intersection configuration experienced higher than predicted and expected crashes per year for property damage only (PDO) and fatal and injury (F&I) crashes during the study period. The potential for safety improvement for the existing configuration is determined as the difference between the number of expected crashes and number of predicted crashes. For this study period, the potential for safety improvement is 1.38 PDO and 0.15 F&I crashes per year.

SIGNAL WARRANT ANALYSIS

A signal warrant analysis was performed at the study intersection to evaluate the need for traffic signal. The traffic signal warrant analysis was conducted in conformance with the requirements of the Federal Highway Administration (FHWA) Manual on Uniform Control Devices (MUTCD) and the FDOT Manual on Uniform Traffic Studies (MUTS). Guidance from the MUTCD indicates that a traffic signal is warranted if one or more warrants is met. The following warrants are applicable at the study intersection:

- Warrant 1 – Eight-Hour Vehicular Volume
- Warrant 2 – Four-Hour Vehicular Volume
- Warrant 7 – Crash Experience

Warrant 1, Condition A and Condition B are **not met** at the study intersection based on the highest eight hours of traffic volumes.

Warrant 2 is **not met** based on the highest four hours of traffic volumes.

Warrant 7 is not met based on criteria 1 – adequate trial of remedial measures and criteria 3 – volume warrants. **Although Warrant 7 is not met, the intersection does meet criteria 2 – correctable crashes, with five or more angle crashes in a 12-month period.** Five angle crashes occurred during 2016, 2017, and 2020. This suggests that an intersection improvement is needed to correct the existing safety issue.

Based on the signal warrant analysis, a signal is not warranted at the intersection of N Miami Avenue and N 163 Street. The signal warrant forms are provided in **Appendix E**.

INTERSECTION CONTROL EVALUATION

Intersection Control Evaluation (ICE) is an evaluation process or methodology used to consider multiple context-sensitive intersection control strategies when planning a new or modified intersection. The goal of ICE is to provide a quantitative decision-making process to identify and select a control strategy that fits the location's context, provides safe travel facilities for all road users, and offers the best overall value. An ICE analysis was performed at the intersection of N Miami Avenue and N 163 Street.

ICE Stage 1

ICE Stage 1 involves two analysis components: 1) A planning level volume-to-capacity (V/C) ratio assessment using the Capacity Analysis at Junctions (CAP-X) tool; and 2) a planning level safety assessment using Safety Performance for Intersection Control Evaluation (SPICE). These assessments are high level in nature, due to the potentially numerous intersection control types that need to be reviewed during the ICE Stage 1 evaluation. Although the intersection does not meet signal warrants, the traffic signal was considered as part of the ICE Stage 1 analysis for comparison. The following intersection control types were evaluated in ICE Stage 1 at the study intersections including the No-Build condition:

- Two-Way Stop Control (TWSC) – No-Build
- All-Way Stop Control (AWSC)
- Signalized Control
- 1x1 Roundabout (one-lane major road and one-lane minor road)
- 50' Inscribed Circle Diameter (ICD) Mini-Roundabout
- 75' ICD Mini-Roundabout

Each control type was compared operationally using a planning level V/C ratio and for safety based on existing 2021 volumes. The V/C ratio is a comparison of the expected traffic volume to intersection capacity. The safety ranking is based upon a predicted number of total and fatal/injury crashes based upon the design year (2045) traffic volumes. A safety ranking of 1 denotes a lower predicted number of fatal/injury crashes while a higher ranking denotes a higher predicted number of fatal/injury crashes when compared to the other alternatives. Note that the roundabout alternatives are ranked ahead of the AWSC alternative due to having a lower number of predicted fatal and injury crashes. **Table 2** provides a comparison of the Stage 1 V/C ratio, safety ranking, and predicted crashes for the alternatives evaluated. ICE Stage 1 CAP-X and SPICE outputs are included in **Appendix F**.

Table 2: Stage 1 ICE Results

Control Strategy	V/C		Safety Ranking	Design Year Predicted Crashes/Year	
	AM	PM		Total	Fatal & Injury
Traffic Signal	0.10	0.17	3	3.53	1.14
TWSC (No-Build)	0.14	0.25	4	3.10	1.18
AWSC	0.44	0.66	2	1.25	0.40
1x1 Roundabout	0.19	0.34	1	1.43	0.25
50' ICD Mini-Roundabout	0.26	0.45	1	1.43	0.25
75' ICD Mini-Roundabout	0.25	0.45	1	1.43	0.25

Following the completion of the ICE Stage 1 analysis, the alternatives were compared. The traffic signal alternative has the best V/C ratio, but a higher number of predicted crashes when compared to the AWSC and roundabout alternatives. Additionally, the intersection does not meet traffic signal warrants.

The No-Build TWSC condition is predicted to have more than four times the number of fatal and injury crashes compared to the roundabout alternatives. The No-Build does not meet the Purpose & Need for the intersection evaluation.

The AWSC had a lower number of predicted crashes, but a higher V/C ratio when compared to the No-Build.

The roundabout alternatives have higher V/C ratios when compared to the No-Build condition but provide the lowest numbers of predicted fatal and injury crashes.

Due to the safety emphasis of the project, the roundabout alternative was selected as the preferred alternative following the completion of ICE Stage 1. ICE Stage 2 is not needed.

The mini-roundabout was selected for concept development due to a balance of right-of-way (ROW) constraints and design vehicle access. The concept is discussed in greater detail in the Concept Development section in this report.

OPERATIONAL ANALYSIS

A detailed Level of Service (LOS) analysis was conducted to compare the existing two-way stop control intersection with a mini-roundabout. The alternatives were evaluated using future 2045 weekday AM and PM peak hour traffic volume conditions. The land use surrounding the intersection consists of single family residential. Low traffic volume growth is anticipated due to the surrounding land use being fully built-out. A growth rate of 1.0 percent was selected as a conservative estimate to develop future volumes. The 2045 volumes were developed by applying a linear 1.0 percent growth rate to all movements. The No-Build scenario (TWSC) was evaluated in Synchro Version 10 using Highway Capacity Manual (HCM) 6th Edition methodologies.

The mini-roundabout alternative was evaluated in SIDRA Intersection 8.0 using HCM 2010 methodologies. The purpose of using HCM 2010 for the mini-roundabout analysis was to develop a more conservative capacity analysis. HCM 2010 capacity model is based upon older US data collected in 2006 which found that drivers frequently tended to come to a full stop even in the absence of conflicting traffic which generated lower capacities compared to international models. More recent data collected feeding into the latest HCM 6th Edition model found that roundabout capacities in the US have increased over time and the HCM 6th Edition now estimates higher capacity. There is not a widely accepted capacity model for mini-roundabouts currently available in the US. While not specifically intended for mini-roundabouts, use of the HCM 2010 model will generate a lower capacity estimate (more conservative) than the HCM 6th Edition. Due to mini-roundabouts having lower capacity than full size roundabouts, HCM 2010 was used to provide a more conservative estimate of the mini-roundabout capacity.

Table 3 provides the results comparison of the operational analysis. The northbound and southbound approaches operate at LOS A in both peak hours and the eastbound and westbound approaches operate at LOS C or LOS B in both peak hour under the No-Build scenario. The mini-roundabout operates at LOS A in both peak hours for all intersection approaches, except for the northbound approach in the PM peak hour which operates at LOS B. The operational analysis report outputs are provided in **Appendix G**.

Table 3: Year 2045 AM and PM Peak Hour Intersection Operational Analysis

Scenario			Eastbound	Westbound	Northbound	Southbound
AM Peak Hour	TWSC (No-Build) *	Delay	15.1	13.7	7.6	7.9
		LOS	C	B	A	A
		V/C	0.19	0.14	0.00	0.01
	Mini-Roundabout	Delay	4.9	5.2	6.8	5.3
		LOS	A	A	A	A
		V/C	0.09	0.08	0.31	0.20
PM Peak Hour	TWSC (No-Build) *	Delay	24.4	19.9	7.7	8.5
		LOS	C	C	A	A
		V/C	0.33	0.35	0.01	0.02
	Mini-Roundabout	Delay	5.3	8.2	10.4	5.8
		LOS	A	A	B	A
		V/C	0.11	0.21	0.54	0.24

*For the TWSC scenario, delay, LOS, and V/C ratio are reported for the left-turn movement only.

PROPOSED IMPROVEMENTS

The No-Build TWSC, AWSC, and roundabout scenarios were evaluated through ICE Stage 1. The mini-roundabout was identified as the preferred alternative based on safety performance. Due to ROW constraints and the intersection context, a mini-roundabout was determined to be the best alternative. The following section describes the development of a planning level concept and opinion of probable cost for a mini-roundabout at N Miami Avenue and N 163 Street.

Concept Development

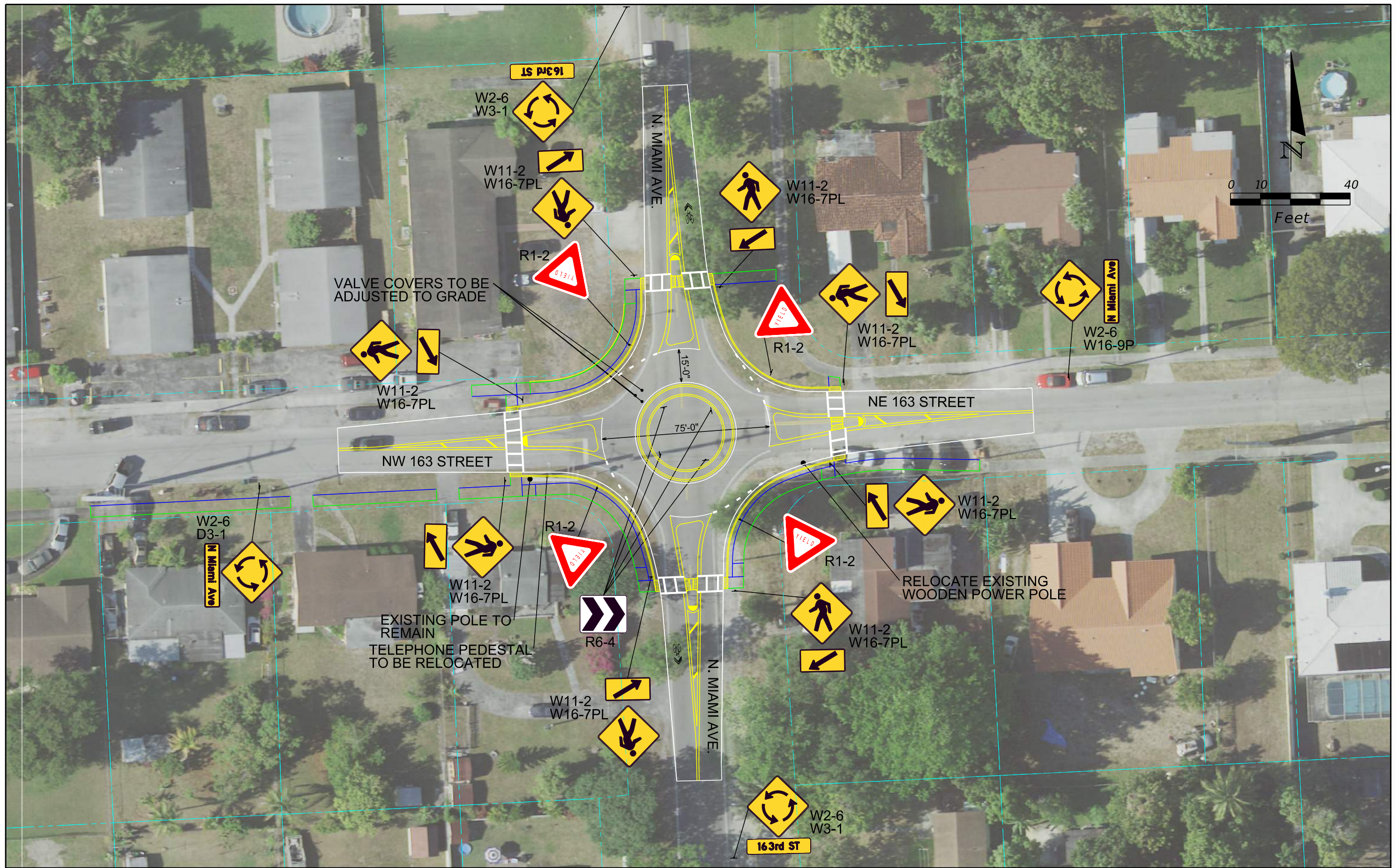
A planning level concept was developed for the mini-roundabout alternative to understand impacts and to be able to develop opinion of probable cost for use in a benefit-cost analysis. The concept is provided in **Figure 8**. The concept incorporates the following elements:

- 75' inscribed circle diameter. **Figure 9** provides a diagram showing how the inscribed circle diameter is measured.
- 15' circulatory roadway width. **Figure 9** provides a diagram showing how the circulatory roadway is measured.
- Raised splitter islands on all four approaches with pedestrian refuges.
- The design vehicle used was a 34' Fire Pumper Tanker.
- Light poles will be added to each corner of the intersection.
- Entry speeds were designed for 25 mph to provide low speeds for bicyclists to travel through the roundabout with vehicular traffic.

The proposed concept has the following impacts to the existing conditions:

- Utility relocation
 - Wood utility pole (1)
 - Telephone pedestal (1)
 - Valve assembly (3)
- Drainage
 - Sediment barrier

The concept stays within the existing ROW and provides new sidewalk connections on all four legs. Fastest path and design vehicle checks are provided in **Appendix H**.



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

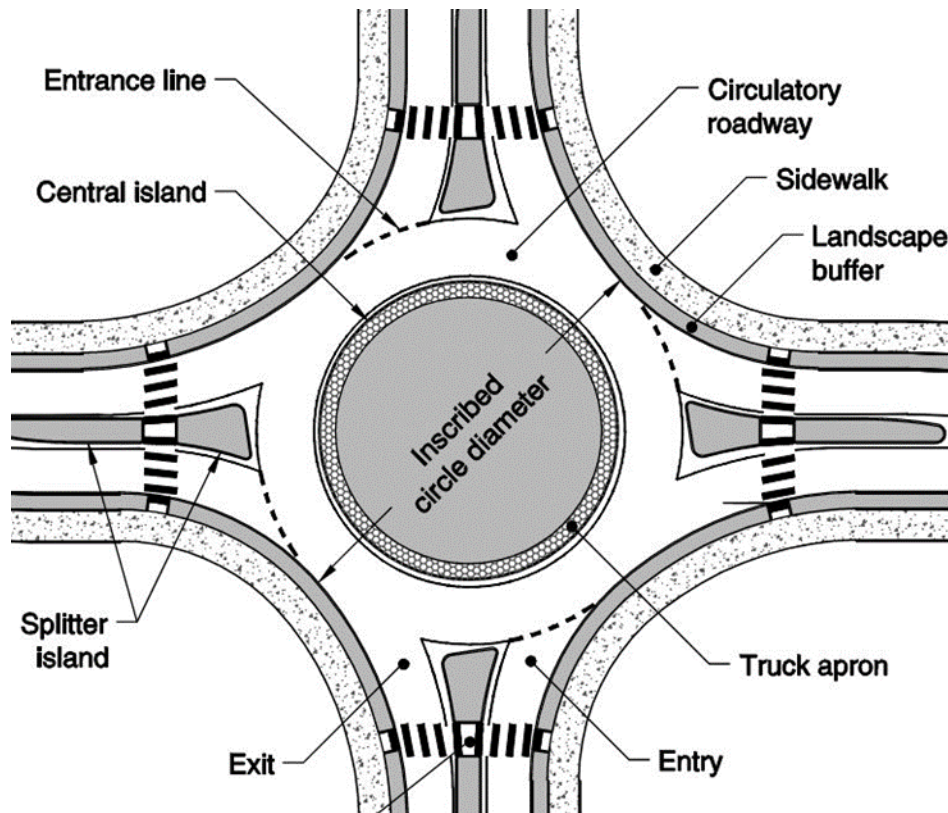


MIAMI-DADE
TRANSPORTATION PLANNING ORGANIZATION

N. MIAMI AVE. & NE 163 STREET
ROUNDBOUT CONCEPT

FIGURE
NO.
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Figure 9: Roundabout Diagram



Source: NCHRP Report 672, Page 6-9

Opinion of Probable Cost

An opinion of probable cost was developed based on the planning level concept. A 30% contingency cost was included. A detailed cost estimate is provided in **Appendix I**.

Table 4 provides a summary of the opinion of probable cost based on the mini-roundabout concept.

Table 4: Opinion of Probable Cost

Cost Item	Cost
Total Estimated Construction Costs	\$299,069
Total Estimated Capital Support Costs	\$143,570
Total Estimated Right-of-Way Costs	\$0
Total Project Cost	\$442,639

Benefit/Cost

The FDOT ICE Tool was used to conduct a benefit/cost analysis. The ICE Tool is used to compare the operational and safety analyses, along with the opinion of probable cost to develop a benefit/cost ratio (B/C) and net present value (NPV) of the alternative. The ICE Tool results are provided in **Appendix J**.

Table 5 provides the ICE Tool delay, safety, and overall B/C analysis results as well as the estimated NPV of the alternative. The overall benefit/cost is 11.13.

Table 5: ICE Tool Benefit/Cost Analysis Results

Alternative	Overall B/C	Delay B/C	Safety B/C	Net Present Value
Mini-Roundabout	11.13	1.87	9.26	\$5,074,817

STAKEHOLDER COORDINATION

The study team conducted coordination meetings with Miami Dade County Public Works (DTPW) Traffic Operations and Traffic Engineering Divisions to discuss the selection of the study intersection and proposed mini-roundabout alternative. The following meetings were held with County staff to discuss the selection of the study intersection and evaluation and concept development:

- March 8, 2021 – a meeting was held to kick-off the project and discuss the study intersection selection process.
- April 1, 2021 – a meeting was held to discuss the selection of study intersections. The County identified 13 intersections for safety analysis. The 13 locations were reviewed and the top three were identified based on historical crash data and potential safety benefit. N Miami Avenue and N 163 Street was selected as one of the three study intersections. Discussion included a review of the County proposed recommendations. The County's proposed recommendations were implemented into the concept development presented in this report.
- April 12, 2021 – a meeting was held to discuss data collection and the design vehicle to be used for the concept development.
 - A 34' Fire Pumper Tanker was selected as the design vehicle.
- April 20, 2021 – a meeting was held to review and receive input on design aspects of the concept development.
- April 23, 2021 – a meeting was held to provide further details on the concept development and discuss anticipated impacts of the mini-roundabout.

DTPW staff is in support of the proposed alternative.

SUMMARY

An Intersection Safety Analysis was conducted at N Miami Avenue and N 163 Street, located in Miami-Dade County. The intersection was identified as a roadway safety improvement project under the TPO Fiscal Year 2026 List of Program Priorities approved June 18, 2020 and included in the newly approved 2027 LOPP on June 17, 2021. Improvements for this intersection were prioritized for evaluation due to an existing pattern of angle crashes. The Purpose & Need of the study is to reduce crashes, most importantly fatalities and serious injuries, by evaluating the intersection and providing justification to apply for Highway Safety Improvement Program (HSIP) funding.

An ICE Stage 1 analysis was conducted to determine the best control type for the intersection. A mini-roundabout was identified as the preferred alternative. There are no right-of-way impacts anticipated with the proposed mini-roundabout design.

A benefit/cost analysis shows an overall benefit of 11.13 with a delay benefit of 1.87 and a safety benefit of 9.26 when compared to the No-Build condition. The net present value of the alternative is \$5,074,817. The safety benefit/cost ratio is greater than 1.0 and the net present value is positive, which meets the requirements for HSIP funding.

APPENDIX A. FIELD OBSERVATION REPORT

FIELD OBSERVATION REPORT

Location	<u>N Miami Avenue & N 163 Street</u>	Date	<u>March 19, 2021</u>
Observer	KAI	Time	Midday

PART I - PHYSICAL CHECKLIST

	NO	YES	COMMENTS
1. Are there sight distance obstructions to:			
a. Traffic control devices?	X		
b. Intersections and driveways?	X		
c. Turning or on-coming vehicles?	X		
2. Does parking affect:			
a. Sight distance?	X		
b. Through or turning vehicle paths?	X		
3. Is horizontal alignment inadequate?	X		
4. Is vertical alignment inadequate?	X		
5. Is pavement width or the number of lanes inadequate?	X		
6. Are intersection or driveway radii too short?	X		
7. Are there problems with driveways such as:			
a. Inadequate design?	X		
b. Location near major intersection?	X		
c. Too many driveways?	X		
8. Is channelization inadequate for:			
a. Reducing conflict points?	X		
b. Separating traffic flows or defining movements?	X		
9. Should pedestrian crosswalks be:			
a. Added?		X	Crosswalks missing on all four legs – to be added in traffic circle concept.
b. Relocated or repainted?	X		

FIELD OBSERVATION REPORT

	NO	YES	COMMENTS
10. Are there problems with traffic signs such as:			
a. Inadequate or improper message?	X		
b. Too many signs?	X		
c. Placement or size?	X		
11. Are there problems with traffic signals such as:			
a. Timing?			N/A
b. Number of signal heads?			N/A
c. Placement or size?			N/A
12. Are there problems with pavement markings such as:			
a. Vehicle paths not clearly marked?	X		
b. Location of the markings?	X		
13. Do posted speed limits appear to be too high or too low for conditions?	X		
14. Does the pavement condition (potholes, irregular surface, etc. appear to contribute to safety problems?	X		
15. Is roadway lighting inadequate?	X		
16. Are there tire skid marks on pavement?	X		
17. Is there evidence of vehicle accident debris such as scar marks on trees, utility poles, embankments or other objects?	X		
18. Is there an abundance of vehicle accident debris such as small pieces of crushed glass, plastic, etc. along the shoulder or in the median area?	X		

FIELD OBSERVATION REPORT

PART II - OPERATIONAL CHECKLIST

		NO	YES	COMMENTS
1.	Do obstructions block the driver's view of opposing or conflicting vehicles?	X		
2.	Do drivers have trouble finding the correct path through the location?	X		
3.	Is there any indication of driver confusion about routes, street names or other guidance information?	X		
4.	Do steep grades create large speed differences?	X		
5.	Are pavement surface conditions creating erratic driver movements?	X		
6.	Does the presence of existing driveways contribute to erratic driver movements?	X		
7.	Is excessive vehicle delay creating unsafe risk taking by motorists?	X		
8.	Are there large speed differences between vehicles:			
a.	Traveling through the location?	X		
b.	Turning at driveways or intersections?	X		
9.	Do drivers respond incorrectly to:			
a.	Signals?			N/A
b.	Signs or other traffic control devices?	X		

FIELD OBSERVATION REPORT

	NO	YES	COMMENTS
10. Are problems being caused by the volume of:			
a. Through traffic?	X		
b. Turning traffic?	X		
11. Do pedestrian movements create conflicts?	X		
12. Do bicycle movements create conflicts?	X		
13. Is there considerable weaving or lane changing by drivers at the location?	X		
14. Are there violations of parking at the location?	X		
15. Are there violations of other traffic control devices or regulations such as:			
a. Running red light?	X		
b. Failing to stop or yield the right-of-way?		X	High number of recorded angle and left turn crashes.
c. Speed limits?	X		
d. Right-turn-on-red?	X		
e. Other?	X		
16. Are there traffic flow problems or traffic conflict patterns associated with turning vehicles?		X	High number of recorded angle and left turn crashes.
17. Are there any other unusual traffic flow problems or traffic conflict patterns?	X		
18. Does inadequate lighting cause drivers to slow down or create erratic maneuvers?	X		
19. Do transit operations create conflicts / excessive delays.	X		

NOTES:

APPENDIX B. BI-DIRECTIONAL 72-HOUR COUNTS

County: 87
 Station: 1631
 Description: N MIAMI AVE N OF NE 163RD ST
 Start Date: 03/16/2021
 Start Time: 0000

Time	Direction: N					Direction: S					Combined	
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Total	Total
0000	14	16	16	7	53	13	12	16	9	50	103	
0100	6	3	3	4	16	7	8	7	4	26	42	
0200	7	6	7	2	22	4	7	4	3	18	40	
0300	6	4	6	5	21	0	3	3	5	11	32	
0400	2	4	6	3	15	5	1	2	0	8	23	
0500	7	7	10	18	42	4	2	8	6	20	62	
0600	12	25	29	35	101	14	14	9	23	60	161	
0700	29	30	44	59	162	22	27	46	39	134	296	
0800	59	56	84	56	255	38	42	47	41	168	423	
0900	58	50	52	51	211	41	40	40	33	154	365	
1000	36	48	53	45	182	32	35	34	45	146	328	
1100	51	48	41	46	186	36	35	31	32	134	320	
1200	53	48	55	55	211	35	39	42	38	154	365	
1300	57	58	55	72	242	41	35	45	53	174	416	
1400	66	92	78	95	331	48	41	40	46	175	506	
1500	75	90	84	89	338	43	52	47	36	178	516	
1600	101	108	118	122	449	33	36	42	49	160	609	
1700	120	95	104	110	429	56	55	40	51	202	631	
1800	98	95	76	61	330	48	57	33	32	170	500	
1900	56	62	59	53	230	35	37	48	42	162	392	
2000	52	44	46	37	179	32	33	26	23	114	293	
2100	28	25	29	31	113	25	30	24	27	106	219	
2200	30	22	22	21	95	20	21	20	10	71	166	
2300	18	16	11	6	51	16	17	16	9	58	109	
24-Hour Totals:					4264						2653	6917

Peak Volume Information						
Direction: N			Direction: S		Combined Directions	
Hour	Volume		Hour	Volume	Hour	Volume
A.M.	745	258	815	171	815	425
P.M.	1615	468	1630	202	1630	657
Daily	1615	468	1630	202	1630	657

County: 87
 Station: 1631
 Description: N MIAMI AVE N OF NE 163RD ST
 Start Date: 03/17/2021
 Start Time: 0000

Time	Direction: N					Direction: S					Combined			
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Total			
0000	7	10	14	7	38		21	16	10	9	56		94	
0100	4	10	2	7	23		4	8	6	6	24		47	
0200	2	6	7	2	17		4	5	2	2	13		30	
0300	2	2	3	6	13		2	1	3	1	7		20	
0400	4	3	2	3	12		2	3	4	2	11		23	
0500	8	8	12	14	42		3	1	9	7	20		62	
0600	18	10	29	32	89		11	13	13	25	62		151	
0700	26	37	42	66	171		17	31	39	43	130		301	
0800	68	64	70	66	268		35	46	36	36	153		421	
0900	58	46	50	51	205		46	41	42	40	169		374	
1000	49	39	52	50	190		37	27	43	40	147		337	
1100	47	38	51	58	194		35	33	40	34	142		336	
1200	50	59	54	62	225		48	39	36	35	158		383	
1300	61	61	55	73	250		41	39	49	51	180		430	
1400	72	93	71	89	325		49	29	36	38	152		477	
1500	100	90	104	110	404		47	38	39	40	164		568	
1600	123	128	115	109	475		42	29	40	39	150		625	
1700	118	117	124	116	475		57	42	49	47	195		670	
1800	99	109	85	70	363		54	40	47	39	180		543	
1900	48	64	69	44	225		45	39	49	36	169		394	
2000	48	46	42	27	163		52	29	33	24	138		301	
2100	24	24	26	23	97		39	25	24	28	116		213	
2200	37	32	26	18	113		23	20	15	12	70		183	
2300	22	16	13	18	69		20	16	11	16	63		132	
24-Hour Totals:					4446							2669		7115

Peak Volume Information						
Direction: N		Direction: S		Combined Directions		
Hour	Volume	Hour	Volume	Hour	Volume	
A.M.	745	268	845	165	745	428
P.M.	1545	476	1700	195	1700	670
Daily	1545	476	1700	195	1700	670

County: 87
 Station: 1631
 Description: N MIAMI AVE N OF NE 163RD ST
 Start Date: 03/18/2021
 Start Time: 0000

Time	Direction: N					Direction: S					Combined	
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Total	
0000	26	12	8	3	49	13	10	9	9	41	90	
0100	9	3	5	4	21	1	10	3	3	17	38	
0200	4	4	2	0	10	1	1	2	1	5	15	
0300	3	3	7	1	14	2	3	5	1	11	25	
0400	2	8	4	6	20	4	1	1	1	7	27	
0500	6	10	7	13	36	6	3	9	6	24	60	
0600	8	24	30	23	85	9	9	17	20	55	140	
0700	27	23	49	63	162	30	31	37	38	136	298	
0800	81	59	69	80	289	47	49	59	40	195	484	
0900	45	48	47	44	184	42	37	47	38	164	348	
1000	39	43	56	44	182	34	31	39	28	132	314	
1100	56	41	43	60	200	37	25	37	37	136	336	
1200	50	42	56	48	196	25	38	43	41	147	343	
1300	70	53	54	70	247	40	30	41	54	165	412	
1400	59	90	85	101	335	46	50	44	54	194	529	
1500	83	97	114	94	388	40	50	32	31	153	541	
1600	116	98	103	104	421	61	38	37	37	173	594	
1700	105	104	112	106	427	40	38	57	52	187	614	
1800	102	96	78	70	346	44	45	46	50	185	531	
1900	60	51	40	47	198	43	30	41	36	150	348	
2000	57	36	41	43	177	37	29	36	29	131	308	
2100	41	50	36	26	153	28	31	25	12	96	249	
2200	28	34	23	12	97	19	20	27	21	87	184	
2300	10	19	16	15	60	8	16	17	13	54	114	
24-Hour Totals:					4297						2645	6942

Peak Volume Information						
Direction: N		Direction: S		Combined Directions		
Hour	Volume	Hour	Volume	Hour	Volume	
A.M.	800	289	800	195	800	484
P.M.	1700	427	1730	198	1715	615
Daily	1700	427	1730	198	1715	615

County: 87
 Station: 1633
 Description: NE 163RD ST E OF N MIAMI AVE
 Start Date: 03/16/2021
 Start Time: 0000

Time	Direction: E					Direction: W					Combined	
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Total	Total
0000	0	3	1	1	5	5	2	3	3	13	18	18
0100	3	0	1	1	5	1	3	1	0	5	10	10
0200	0	0	2	1	3	0	1	1	2	4	7	7
0300	2	0	1	0	3	0	2	1	0	3	6	6
0400	0	2	0	1	3	1	2	1	0	4	7	7
0500	2	1	1	1	5	2	2	2	6	12	17	17
0600	3	0	0	2	5	3	1	14	4	22	27	27
0700	6	2	7	7	22	6	8	13	16	43	65	65
0800	12	16	15	17	60	12	12	16	10	50	110	110
0900	15	10	11	2	38	7	12	11	9	39	77	77
1000	5	5	5	6	21	6	9	12	14	41	62	62
1100	5	5	10	9	29	11	10	13	5	39	68	68
1200	6	7	15	12	40	10	4	15	11	40	80	80
1300	8	10	12	15	45	12	15	22	19	68	113	113
1400	8	11	7	11	37	22	18	17	28	85	122	122
1500	10	16	10	7	43	19	32	25	29	105	148	148
1600	13	14	5	4	36	41	21	41	34	137	173	173
1700	9	10	6	13	38	28	21	28	33	110	148	148
1800	11	9	8	9	37	33	25	21	13	92	129	129
1900	10	2	5	6	23	11	7	6	6	30	53	53
2000	7	7	3	3	20	9	6	9	7	31	51	51
2100	6	5	6	6	23	5	8	7	7	27	50	50
2200	3	2	2	3	10	5	6	8	2	21	31	31
2300	1	1	2	2	6	4	3	1	5	13	19	19
24-Hour Totals:					557						1034	1591

Peak Volume Information						
Direction: E			Direction: W		Combined Directions	
Hour	Volume		Hour	Volume	Hour	Volume
A.M.	815	63	745	56	800	110
P.M.	1445	47	1600	137	1515	173
Daily	815	63	1600	137	1515	173

County: 87
 Station: 1633
 Description: NE 163RD ST E OF N MIAMI AVE
 Start Date: 03/17/2021
 Start Time: 0000

Time	Direction: E					Direction: W					Combined	
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Total	
0000	1	3	2	1	7	3	5	8	2	18	25	
0100	2	0	0	0	2	0	0	0	2	2	4	
0200	0	3	0	0	3	2	2	0	2	6	9	
0300	0	0	0	0	0	1	0	0	0	1	1	
0400	1	2	0	1	4	2	0	0	2	4	8	
0500	0	0	1	1	2	2	2	0	5	9	11	
0600	0	2	1	0	3	3	2	10	5	20	23	
0700	5	7	2	9	23	7	14	13	9	43	66	
0800	12	15	21	19	67	14	13	17	16	60	127	
0900	20	11	15	7	53	9	5	10	10	34	87	
1000	5	6	8	4	23	8	12	9	17	46	69	
1100	2	15	11	12	40	6	8	10	16	40	80	
1200	4	8	15	8	35	16	13	7	12	48	83	
1300	12	15	12	20	59	16	9	23	18	66	125	
1400	11	16	3	11	41	15	17	20	27	79	120	
1500	9	8	10	6	33	36	24	29	44	133	166	
1600	8	9	8	8	33	37	33	43	30	143	176	
1700	15	16	10	19	60	27	27	22	30	106	166	
1800	16	15	17	9	57	26	16	29	16	87	144	
1900	8	4	4	9	25	13	12	11	9	45	70	
2000	7	12	7	5	31	13	10	9	8	40	71	
2100	4	8	4	4	20	5	5	6	2	18	38	
2200	3	3	3	2	11	10	6	3	6	25	36	
2300	0	4	4	1	9	2	5	2	1	10	19	
24-Hour Totals:					641						1083	1724

Peak Volume Information						
Direction: E		Direction: W		Combined Directions		
Hour	Volume	Hour	Volume	Hour	Volume	
A.M.	815	75	800	60	815	130
P.M.	1745	67	1545	157	1545	188
Daily	815	75	1545	157	1545	188

County: 87
 Station: 1633
 Description: NE 163RD ST E OF N MIAMI AVE
 Start Date: 03/18/2021
 Start Time: 0000

Time	Direction: E					Direction: W					Combined	
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Total	Total
0000	2	2	3	2	9	6	1	1	2	10	19	19
0100	0	2	0	0	2	4	1	3	2	10	12	12
0200	0	2	1	0	3	1	1	0	1	3	6	6
0300	0	0	0	0	0	2	0	3	0	5	5	5
0400	0	1	1	1	3	0	0	2	1	3	6	6
0500	0	0	0	1	1	2	3	0	2	7	8	8
0600	1	0	0	1	2	4	2	12	6	24	26	26
0700	4	4	8	11	27	8	7	13	12	40	67	67
0800	16	18	15	10	59	10	11	13	19	53	112	112
0900	13	15	4	4	36	7	5	10	8	30	66	66
1000	5	8	4	4	21	6	8	8	11	33	54	54
1100	3	6	4	6	19	12	10	7	17	46	65	65
1200	5	8	12	11	36	16	17	18	10	61	97	97
1300	4	4	12	10	30	8	20	20	19	67	97	97
1400	20	11	9	9	49	16	37	31	33	117	166	166
1500	17	13	13	7	50	29	37	41	23	130	180	180
1600	9	9	12	8	38	29	47	39	35	150	188	188
1700	11	14	7	8	40	39	43	37	33	152	192	192
1800	14	8	8	11	41	24	12	12	26	74	115	115
1900	10	6	4	4	24	16	8	7	7	38	62	62
2000	9	2	3	1	15	9	6	11	8	34	49	49
2100	5	4	7	2	18	5	3	4	8	20	38	38
2200	4	4	3	1	12	6	2	10	0	18	30	30
2300	2	1	2	1	6	4	4	3	5	16	22	22
24-Hour Totals:					541						1141	1682

Peak Volume Information						
Direction: E			Direction: W		Combined Directions	
Hour	Volume		Hour	Volume	Hour	Volume
A.M.	745	60	800	53	800	112
P.M.	1330	53	1615	160	1630	201
Daily	745	60	1615	160	1630	201

County: 87
 Station: 1635
 Description: N MIAMI AVE S OF NE 163RD ST
 Start Date: 03/16/2021
 Start Time: 0000

	Direction: N					Direction: S					Combined	
Time	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Total	
0000	11	18	15	8	52	12	13	16	8	49	101	
0100	5	3	2	4	14	6	9	7	4	26	40	
0200	8	5	7	2	22	3	8	3	3	17	39	
0300	6	4	4	5	19	0	3	2	6	11	30	
0400	2	3	5	4	14	4	1	2	0	7	21	
0500	6	6	9	14	35	5	2	7	6	20	55	
0600	11	23	21	35	90	12	14	8	25	59	149	
0700	28	24	44	57	153	23	25	43	43	134	287	
0800	60	51	76	49	236	35	43	43	37	158	394	
0900	58	39	48	45	190	43	39	42	32	156	346	
1000	36	50	47	43	176	32	36	32	44	144	320	
1100	47	40	32	45	164	39	36	36	29	140	304	
1200	50	53	48	55	206	33	38	40	36	147	353	
1300	59	51	54	66	230	38	34	47	54	173	403	
1400	78	66	55	68	267	57	56	39	39	191	458	
1500	65	79	76	73	293	43	51	51	40	185	478	
1600	79	96	99	105	379	35	35	49	51	170	549	
1700	112	82	92	95	381	55	60	41	51	207	588	
1800	87	91	72	62	312	52	60	38	33	183	495	
1900	52	61	56	47	216	33	38	48	38	157	373	
2000	51	39	43	36	169	28	28	29	26	111	280	
2100	29	25	30	35	119	23	25	25	25	98	217	
2200	27	19	18	19	83	19	19	21	9	68	151	
2300	16	14	10	5	45	15	16	15	7	53	98	
24-Hour Totals:					3865						2664	6529

Peak Volume Information						
Direction: N		Direction: S		Combined Directions		
Hour	Volume	Hour	Volume	Hour	Volume	
A.M.	745	244	815	166	745	408
P.M.	1615	412	1630	215	1630	613
Daily	1615	412	1630	215	1630	613

County: 87
 Station: 1635
 Description: N MIAMI AVE S OF NE 163RD ST
 Start Date: 03/17/2021
 Start Time: 0000

Time	Direction: N					Direction: S					Combined	
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Total	Total
0000	7	9	12	7	35	21	16	8	9	54	89	
0100	5	10	2	6	23	4	8	5	6	23	46	
0200	2	6	7	1	16	5	5	2	2	14	30	
0300	1	2	2	6	11	2	1	2	2	7	18	
0400	5	3	2	2	12	3	1	4	3	11	23	
0500	7	6	12	14	39	4	1	9	8	22	61	
0600	16	10	23	29	78	11	12	14	24	61	139	
0700	25	31	38	65	159	19	28	43	44	134	293	
0800	65	65	70	63	263	37	41	39	36	153	416	
0900	51	47	39	48	185	44	38	41	41	164	349	
1000	48	36	49	46	179	37	32	41	42	152	331	
1100	41	41	49	57	188	35	31	41	34	141	329	
1200	46	51	50	63	210	47	39	33	33	152	362	
1300	55	63	54	69	241	39	36	50	55	180	421	
1400	70	89	66	85	310	50	33	39	38	160	470	
1500	81	76	92	85	334	46	40	41	47	174	508	
1600	106	107	93	88	394	47	33	47	40	167	561	
1700	103	116	109	102	430	59	48	55	40	202	632	
1800	86	105	79	69	339	53	36	48	37	174	513	
1900	48	59	67	44	218	46	42	45	37	170	388	
2000	45	44	38	33	160	54	27	29	25	135	295	
2100	23	24	26	23	96	37	23	22	26	108	204	
2200	31	33	26	19	109	26	20	17	15	78	187	
2300	20	14	14	17	65	20	15	10	16	61	126	
24-Hour Totals:					4094						2697	6791

Peak Volume Information						
Direction: N		Direction: S		Combined Directions		
Hour	Volume	Hour	Volume	Hour	Volume	
A.M.	745	265	730	165	745	426
P.M.	1700	430	1645	202	1700	632
Daily	1700	430	1645	202	1700	632

County: 87
 Station: 1635
 Description: N MIAMI AVE S OF NE 163RD ST
 Start Date: 03/18/2021
 Start Time: 0000

	Direction: N					Direction: S					Combined	
Time	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Total	
0000	23	13	7	4	47	12	11	7	7	37	84	
0100	8	3	5	3	19	1	11	4	4	20	39	
0200	2	5	3	0	10	1	2	1	2	6	16	
0300	1	2	6	1	10	2	3	5	1	11	21	
0400	2	8	3	5	18	4	1	2	1	8	26	
0500	5	8	6	13	32	7	3	9	7	26	58	
0600	6	23	23	21	73	10	10	17	19	56	129	
0700	26	21	45	64	156	29	30	36	38	133	289	
0800	77	58	76	68	279	45	48	56	43	192	471	
0900	44	50	44	42	180	39	33	46	35	153	333	
1000	40	38	52	42	172	30	30	36	28	124	296	
1100	51	39	42	55	187	35	25	38	37	135	322	
1200	41	37	49	47	174	26	34	42	38	140	314	
1300	62	38	53	63	216	37	31	44	53	165	381	
1400	57	70	77	80	284	42	52	43	56	193	477	
1500	75	81	104	83	343	43	47	40	31	161	504	
1600	99	82	93	85	359	61	44	38	39	182	541	
1700	93	83	96	97	369	42	39	58	54	193	562	
1800	93	98	78	65	334	45	45	47	52	189	523	
1900	57	52	39	39	187	43	27	38	35	143	330	
2000	60	34	37	40	171	34	33	37	31	135	306	
2100	42	49	37	21	149	26	32	24	14	96	245	
2200	26	33	19	12	90	17	16	27	17	77	167	
2300	9	17	16	14	56	8	18	19	13	58	114	
24-Hour Totals:					3915						2633	6548

Peak Volume Information						
Direction: N			Direction: S		Combined Directions	
Hour	Volume		Hour	Volume	Hour	Volume
A.M.	800	279	800	192	800	471
P.M.	1730	384	1730	202	1730	586
Daily	1730	384	1730	202	1730	586

County: 87
Station: 1637
Description: NE 163RD ST W OF N MIAMI AVE
Start Date: 03/16/2021
Start Time: 0000

Time	Direction: E					Direction: W					Combined	
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Total	Total
0000	0	1	2	0	3	2	2	2	4	10	13	13
0100	3	0	1	1	5	0	3	1	0	4	9	9
0200	0	0	1	1	2	0	1	0	3	4	6	6
0300	2	0	2	0	4	0	2	0	0	2	6	6
0400	0	1	1	1	3	1	2	1	0	4	7	7
0500	1	0	0	1	2	0	2	1	2	5	7	7
0600	1	1	1	2	5	2	0	8	2	12	17	17
0700	4	4	3	6	17	2	6	11	11	30	47	47
0800	9	19	16	17	61	12	7	10	10	39	100	100
0900	13	11	9	2	35	3	5	5	4	17	52	52
1000	3	5	5	7	20	5	7	10	6	28	48	48
1100	5	6	13	9	33	6	3	6	8	23	56	56
1200	4	3	16	6	29	9	6	7	8	30	59	59
1300	8	9	8	17	42	7	9	14	14	44	86	86
1400	11	10	5	7	33	16	16	11	15	58	91	91
1500	6	13	12	9	40	15	19	14	12	60	100	100
1600	11	10	6	4	31	14	13	13	17	57	88	88
1700	7	11	4	17	39	15	6	13	14	48	87	87
1800	11	7	4	4	26	16	12	9	10	47	73	73
1900	6	2	5	6	19	3	5	5	4	17	36	36
2000	5	4	3	1	13	8	4	8	2	22	35	35
2100	3	3	5	3	14	5	9	7	8	29	43	43
2200	3	4	2	4	13	5	6	4	2	17	30	30
2300	1	2	2	1	6	3	2	2	4	11	17	17
24-Hour Totals:					495						618	1113

Peak Volume Information						
Direction: E			Direction: W		Combined Directions	
Hour	Volume		Hour	Volume	Hour	Volume
A.M.	815	65	730	41	800	100
P.M.	1330	46	1445	63	1330	106
Daily	815	65	1445	63	1330	106

County: 87
 Station: 1637
 Description: NE 163RD ST W OF N MIAMI AVE
 Start Date: 03/17/2021
 Start Time: 0000

Time	Direction: E					Direction: W					Combined Total	
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total		
0000	1	2	0	1	4	2	3	5	2	12	16	
0100	2	0	0	0	2	1	0	1	1	3	5	
0200	0	2	0	0	2	1	1	0	1	3	5	
0300	0	0	2	0	2	0	0	1	0	1	3	
0400	0	0	0	2	2	1	0	0	2	3	5	
0500	0	0	1	1	2	0	0	0	3	3	5	
0600	0	2	1	0	3	2	3	4	2	11	14	
0700	4	6	3	14	27	4	9	9	12	34	61	
0800	10	11	16	16	53	10	13	10	9	42	95	
0900	20	11	17	7	55	5	5	5	6	21	76	
1000	5	4	6	4	19	5	3	7	9	24	43	
1100	2	12	9	11	34	2	7	5	13	27	61	
1200	6	10	11	4	31	15	7	2	10	34	65	
1300	12	10	8	21	51	13	7	16	12	48	99	
1400	11	18	6	6	41	10	15	14	17	56	97	
1500	8	11	7	8	34	19	8	14	14	55	89	
1600	10	9	7	12	38	16	10	20	12	58	96	
1700	18	21	15	12	66	11	14	9	16	50	116	
1800	11	11	12	3	37	9	13	15	14	51	88	
1900	8	5	2	11	26	10	9	8	8	35	61	
2000	4	5	4	1	14	5	6	6	9	26	40	
2100	4	6	4	4	18	6	4	6	2	18	36	
2200	3	1	1	3	8	3	5	2	5	15	23	
2300	0	3	1	1	5	0	2	2	0	4	9	
24-Hour Totals:					574						634	1208

Peak Volume Information						
Direction: E		Direction: W		Combined Directions		
Hour	Volume	Hour	Volume	Hour	Volume	
A.M.	845 64	745	45	815	100	
P.M.	1645 66	1415	65	1700	116	
Daily	1645 66	1415	65	1700	116	

County: 87
 Station: 1637
 Description: NE 163RD ST W OF N MIAMI AVE
 Start Date: 03/18/2021
 Start Time: 0000

Time	Direction: E					Direction: W					Combined	
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Total	Total
0000	2	1	2	0	5	3	1	0	2	6	11	11
0100	0	2	0	1	3	3	0	3	0	6	9	9
0200	0	1	0	1	2	0	0	1	1	2	4	4
0300	0	1	0	0	1	0	0	2	0	2	3	3
0400	0	1	2	2	5	0	0	2	0	2	7	7
0500	1	1	0	1	3	3	1	0	1	5	8	8
0600	1	0	0	3	4	1	0	6	7	14	18	18
0700	3	5	7	13	28	7	8	10	16	41	69	69
0800	16	16	12	8	52	8	10	14	7	39	91	91
0900	12	10	4	2	28	6	4	8	6	24	52	52
1000	4	7	2	2	15	9	4	3	6	22	37	37
1100	4	2	3	3	12	8	5	5	9	27	39	39
1200	7	7	10	8	32	11	15	11	6	43	75	75
1300	4	7	7	12	30	4	11	12	16	43	73	73
1400	18	10	10	12	50	15	17	23	15	70	120	120
1500	12	9	6	5	32	15	16	23	11	65	97	97
1600	9	8	10	10	37	13	25	25	14	77	114	114
1700	7	12	19	4	42	24	22	31	18	95	137	137
1800	9	5	7	6	27	11	12	10	15	48	75	75
1900	6	10	2	4	22	10	10	8	5	33	55	55
2000	8	4	4	2	18	12	4	7	6	29	47	47
2100	6	4	5	4	19	7	4	4	4	19	38	38
2200	4	3	5	1	13	6	3	7	3	19	32	32
2300	1	2	2	0	5	3	1	1	3	8	13	13
24-Hour Totals:					485						739	1224

Peak Volume Information						
Direction: E			Direction: W		Combined Directions	
Hour	Volume		Hour	Volume	Hour	Volume
A.M.	745	57	745	48	745	105
P.M.	1345	50	1700	95	1645	139
Daily	745	57	1700	95	1645	139

APPENDIX C. TURNING MOVEMENT COUNTS (AM AND PM)

CTS Engineering, Inc

8095 NW 12 Street, Ste 301

Doral, FL 33126

CLIENT: MDC TPO
 JOB NO.: TWO 3
 PROJECT: N Miami Avenue and NE 163 Street
 COUNTY: Miami-Dade

File Name : 2- N Miami Ave & NE 163rd St
 Site Code : 00000000
 Start Date : 3/17/2021
 Page No : 1

Groups Printed- Autos - Heavy Vehicles

	NE 163rd St Eastbound					NE 163rd St Westbound					N Miami Ave Northbound					N Miami Ave Southbound					
Start Time	U-Turns	Left	Thru	Right	App. Total	U-Turns	Left	Thru	Right	App. Total	U-Turns	Left	Thru	Right	App. Total	U-Turns	Left	Thru	Right	App. Total	Int. Total
07:45 AM	0	0	8	5	13	0	1	5	3	9	0	3	64	1	68	0	0	37	3	40	130
Total	0	0	8	5	13	0	1	5	3	9	0	3	64	1	68	0	0	37	3	40	130
08:00 AM	0	1	9	1	11	0	2	8	4	14	0	1	60	2	63	0	1	34	1	36	124
08:15 AM	0	0	10	0	10	0	1	11	1	13	0	1	59	0	60	0	3	41	1	45	128
08:30 AM	0	2	15	0	17	0	7	6	3	16	0	1	65	4	70	0	2	32	2	36	139
08:45 AM	0	3	14	0	17	0	2	5	8	15	0	2	57	4	63	0	2	32	2	36	131
Total	0	6	48	1	55	0	12	30	16	58	0	5	241	10	256	0	8	139	6	153	522
09:00 AM	0	3	17	0	20	0	3	3	3	9	0	0	52	0	52	0	2	45	1	48	129
09:15 AM	0	0	12	1	13	0	0	2	3	5	0	0	46	0	46	0	1	36	3	40	104
09:30 AM	0	3	12	1	16	0	3	3	4	10	0	1	39	0	40	0	3	35	1	39	105
*** BREAK ***																					
Total	0	6	41	2	49	0	6	8	10	24	0	1	137	0	138	0	6	116	5	127	338
*** BREAK ***																					
04:00 PM	0	6	3	1	10	0	6	12	17	35	0	3	100	4	107	0	1	42	1	44	196
04:15 PM	0	2	5	2	9	0	5	8	19	32	0	0	107	1	108	0	1	25	2	28	177
04:30 PM	0	3	4	1	8	0	4	19	18	41	0	0	91	2	93	0	1	38	1	40	182
04:45 PM	0	6	4	2	12	0	5	8	16	29	0	0	82	3	85	0	1	35	3	39	165
Total	0	17	16	6	39	0	20	47	70	137	0	3	380	10	393	0	4	140	7	151	720
05:00 PM	0	6	11	1	18	0	5	9	15	29	0	3	96	1	100	0	3	54	0	57	204
05:15 PM	0	9	14	2	25	0	5	11	10	26	0	3	113	1	117	0	3	38	0	41	209
05:30 PM	0	9	5	2	16	0	5	9	11	25	0	0	105	4	109	0	1	49	0	50	200
05:45 PM	0	1	11	0	12	0	2	9	13	24	0	3	100	1	104	0	6	35	2	43	183
Total	0	25	41	5	71	0	17	38	49	104	0	9	414	7	430	0	13	176	2	191	796
Grand Total	0	54	154	19	227	0	56	128	148	332	0	21	1236	28	1285	0	31	608	23	662	2506
Apprch %	0	23.8	67.8	8.4		0	16.9	38.6	44.6		0	1.6	96.2	2.2		0	4.7	91.8	3.5		
Total %	0	2.2	6.1	0.8	9.1	0	2.2	5.1	5.9	13.2	0	0.8	49.3	1.1	51.3	0	1.2	24.3	0.9	26.4	
Autos	0	51	149	19	219	0	56	127	144	327	0	21	1210	28	1259	0	31	597	22	650	2455
% Autos	0	94.4	96.8	100	96.5	0	100	99.2	97.3	98.5	0	100	97.9	100	98	0	100	98.2	95.7	98.2	98
Heavy Vehicles	0	3	5	0	8	0	0	1	4	5	0	0	26	0	26	0	0	11	1	12	51
% Heavy Vehicles	0	5.6	3.2	0	3.5	0	0	0.8	2.7	1.5	0	0	2.1	0	2	0	0	1.8	4.3	1.8	2

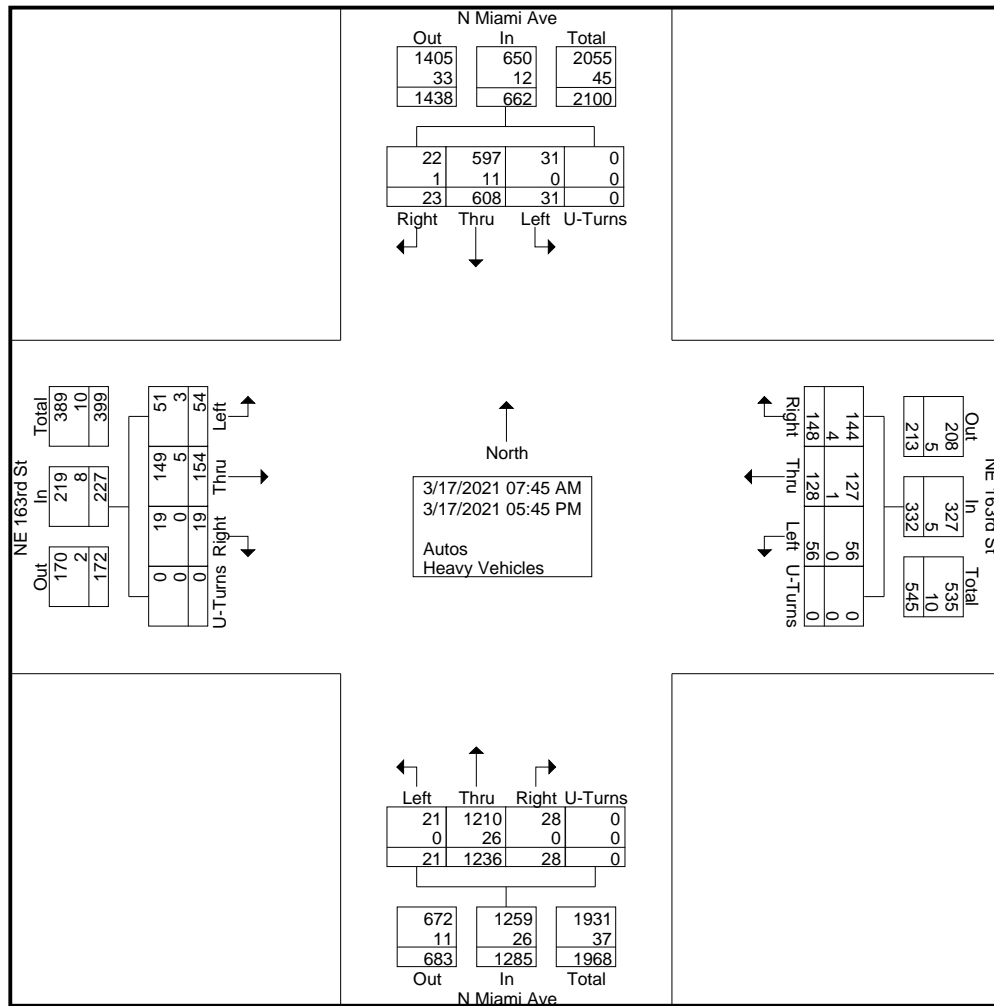
CTS Engineering, Inc

8095 NW 12 Street, Ste 301

Doral, FL 33126

CLIENT: MDC TPO
 JOB NO.: TWO 3
 PROJECT: N Miami Avenue and NE 163 Street
 COUNTY: Miami-Dade

File Name : 2- N Miami Ave & NE 163rd St
 Site Code : 00000000
 Start Date : 3/17/2021
 Page No : 2



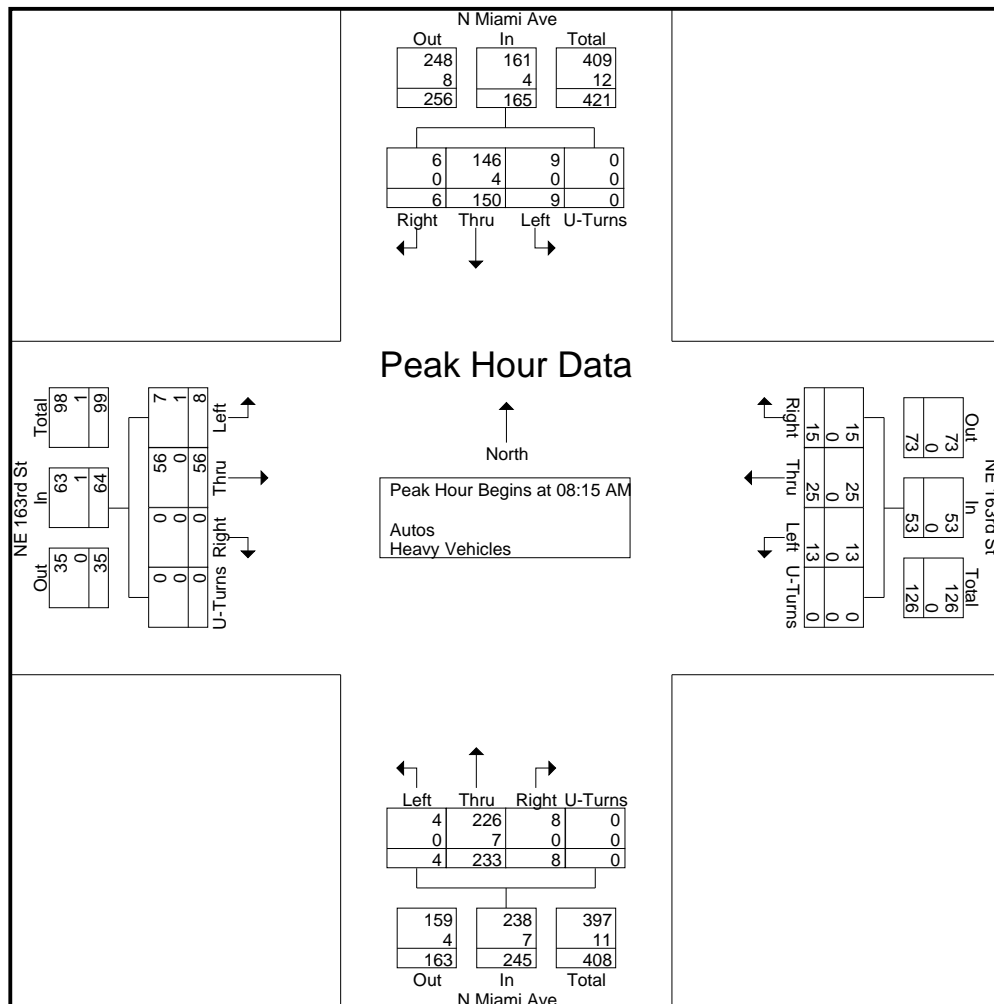
CTS Engineering, Inc

8095 NW 12 Street, Ste 301
Doral, FL 33126

CLIENT: MDC TPO
JOB NO.: TWO 3
PROJECT: N Miami Avenue and NE 163 Street
COUNTY: Miami-Dade

File Name : 2- N Miami Ave & NE 163rd St
Site Code : 00000000
Start Date : 3/17/2021
Page No : 3

	NE 163rd St Eastbound					NE 163rd St Westbound					N Miami Ave Northbound					N Miami Ave Southbound					
Start Time	U-Turns	Left	Thru	Right	App. Total	U-Turns	Left	Thru	Right	App. Total	U-Turns	Left	Thru	Right	App. Total	U-Turns	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:45 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:15 AM																					
08:15 AM	0	0	10	0	10	0	1	11	1	13	0	1	59	0	60	0	3	41	1	45	128
08:30 AM	0	2	15	0	17	0	7	6	3	16	0	1	65	4	70	0	2	32	2	36	139
08:45 AM	0	3	14	0	17	0	2	5	8	15	0	2	57	4	63	0	2	32	2	36	131
09:00 AM	0	3	17	0	20	0	3	3	3	9	0	0	52	0	52	0	2	45	1	48	129
Total Volume	0	8	56	0	64	0	13	25	15	53	0	4	233	8	245	0	9	150	6	165	527
% App. Total	0	12.5	87.5	0		0	24.5	47.2	28.3		0	1.6	95.1	3.3		0	5.5	90.9	3.6		
PHF	.000	.667	.824	.000	.800	.000	.464	.568	.469	.828	.000	.500	.896	.500	.875	.000	.750	.833	.750	.859	.948
Autos	0	7	56	0	63	0	13	25	15	53	0	4	226	8	238	0	9	146	6	161	515
% Autos	0	87.5	100	0	98.4	0	100	100	100	100	0	100	97.0	100	97.1	0	100	97.3	100	97.6	97.7
Heavy Vehicles	0	1	0	0	1	0	0	0	0	0	0	0	7	0	7	0	0	4	0	4	12
% Heavy Vehicles	0	12.5	0	0	1.6	0	0	0	0	0	0	0	3.0	0	2.9	0	0	2.7	0	2.4	2.3



CTS Engineering, Inc

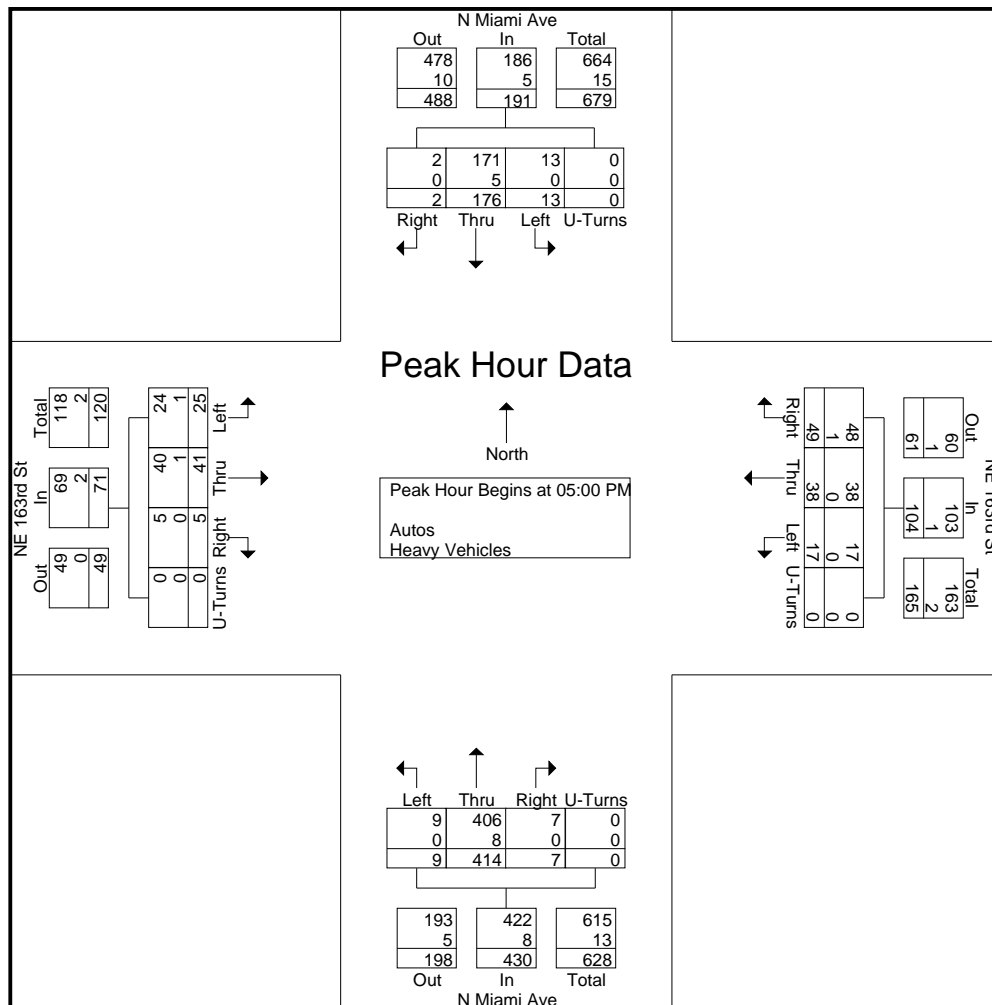
8095 NW 12 Street, Ste 301

Doral, FL 33126

CLIENT: MDC TPO
 JOB NO.: TWO 3
 PROJECT: N Miami Avenue and NE 163 Street
 COUNTY: Miami-Dade

File Name : 2- N Miami Ave & NE 163rd St
 Site Code : 00000000
 Start Date : 3/17/2021
 Page No : 4

	NE 163rd St Eastbound					NE 163rd St Westbound					N Miami Ave Northbound					N Miami Ave Southbound					
Start Time	U-Turns	Left	Thru	Right	App. Total	U-Turns	Left	Thru	Right	App. Total	U-Turns	Left	Thru	Right	App. Total	U-Turns	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	6	11	1	18	0	5	9	15	29	0	3	96	1	100	0	3	54	0	57	204
05:15 PM	0	9	14	2	25	0	5	11	10	26	0	3	113	1	117	0	3	38	0	41	209
05:30 PM	0	9	5	2	16	0	5	9	11	25	0	0	105	4	109	0	1	49	0	50	200
05:45 PM	0	1	11	0	12	0	2	9	13	24	0	3	100	1	104	0	6	35	2	43	183
Total Volume	0	25	41	5	71	0	17	38	49	104	0	9	414	7	430	0	13	176	2	191	796
% App. Total	0	35.2	57.7	7		0	16.3	36.5	47.1		0	2.1	96.3	1.6		0	6.8	92.1	1		
PHF	.000	.694	.732	.625	.710	.000	.850	.864	.817	.897	.000	.750	.916	.438	.919	.000	.542	.815	.250	.838	.952
Autos	0	24	40	5	69	0	17	38	48	103	0	9	406	7	422	0	13	171	2	186	780
% Autos	0	96.0	97.6	100	97.2	0	100	100	98.0	99.0	0	100	98.1	100	98.1	0	100	97.2	100	97.4	98.0
Heavy Vehicles	0	1	1	0	2	0	0	0	1	1	0	0	8	0	8	0	0	5	0	5	16
% Heavy Vehicles	0	4.0	2.4	0	2.8	0	0	0	2.0	1.0	0	0	1.9	0	1.9	0	0	2.8	0	2.6	2.0



CTS Engineering, Inc

8095 NW 12 Street, Ste 301

Doral, FL 33126

CLIENT: MDC TPO
 JOB NO.: TWO 3
 PROJECT: N Miami Avenue and NE 163 Street
 COUNTY: Miami-Dade

File Name : 2- N Miami Ave & NE 163rd St
 Site Code : 00000000
 Start Date : 3/17/2021
 Page No : 1

Groups Printed- Heavy Vehicles

	NE 163rd St Eastbound					NE 163rd St Westbound					N Miami Ave Northbound					N Miami Ave Southbound						
Start Time	U-Turns	Left	Thru	Right	App. Total	U-Turns	Left	Thru	Right	App. Total	U-Turns	Left	Thru	Right	App. Total	U-Turns	Left	Thru	Right	App. Total	Int. Total	
07:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	2	0	2	0	0	1	0	1	1	4
Total	0	0	1	0	1	0	0	0	0	0	0	0	2	0	2	0	0	1	0	1	1	4
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	2	0	2	2	5
08:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	1	3
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	1	0	1	1	3
Total	0	1	0	0	1	0	0	0	0	0	0	0	6	0	6	0	0	4	1	5	5	12
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
09:15 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
09:30 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	2
*** BREAK ***																						
Total	0	0	2	0	2	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	1	4
*** BREAK ***																						
04:00 PM	0	0	0	0	0	0	0	1	1	2	0	0	1	0	1	0	0	0	0	0	0	3
04:15 PM	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1	0	0	0	0	0	0	2
04:30 PM	0	1	0	0	1	0	0	0	1	1	0	0	4	0	4	0	0	0	0	0	0	6
04:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	4
Total	0	1	1	0	2	0	0	1	3	4	0	0	9	0	9	0	0	0	0	0	0	15
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	1	0	1	1	4
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	2	0	2	2	6
05:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2
05:45 PM	0	0	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	2	0	2	2	4
Total	0	1	1	0	2	0	0	0	1	1	0	0	8	0	8	0	0	5	0	5	5	16
Grand Total	0	3	5	0	8	0	0	1	4	5	0	0	26	0	26	0	0	11	1	12	12	51
Apprch %	0	37.5	62.5	0		0	0	20	80		0	0	100	0		0	0	91.7	8.3			
Total %	0	5.9	9.8	0	15.7	0	0	2	7.8	9.8	0	0	51	0	51	0	0	21.6	2	23.5		

CTS Engineering, Inc

8095 NW 12 Street, Ste 301

Doral, FL 33126

CLIENT: MDC TPO
 JOB NO.: TWO 3
 PROJECT: N Miami Avenue and NE 163 Street
 COUNTY: Miami-Dade

File Name : 2- N Miami Ave & NE 163rd St
 Site Code : 00000000
 Start Date : 3/17/2021
 Page No : 1

Groups Printed- Peds & Bikes

	NE 163rd St Eastbound					NE 163rd St Westbound					N Miami Ave Northbound					N Miami Ave Southbound					
Start Time	Peds			Bikes	App. Total	Peds			Bikes	App. Total	Peds			Bikes	App. Total	Peds			Bikes	App. Total	Int. Total
07:45 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
*** BREAK ***																					
Total	1	0	0	0	1	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	3
*** BREAK ***																					
04:15 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
04:30 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
04:45 PM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	4	0	0	0	4	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	6
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
*** BREAK ***																					
05:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***																					
Total	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
Grand Total	6	0	0	0	6	2	0	0	0	2	2	0	0	0	2	2	0	0	0	2	12
Apprch %	100	0	0	0		100	0	0	0		100	0	0	0		100	0	0	0		
Total %	50	0	0	0	50	16.7	0	0	0	16.7	16.7	0	0	0	16.7	16.7	0	0	0	16.7	

APPENDIX D. CRASH SUMMARY

Crash Summary

Crash Number	Collision Diagram Number	Date	Time	Crash Type	Fatal	Injuries	Property Damage	Day / Night	Wet / Dry	Data Source
866995910	1	09/27/2016	1654	Angle	0	0	1	Day	Wet	SSOGis
866991460	2	09/02/2016	0659	Angle	0	1	0	Day	Dry	SSOGis
859784140	3	01/21/2016	0755	Angle	0	0	1	Day	Dry	SSOGis
865258910	4	07/30/2016	1913	Fixed Object/Run-Off Road	0	0	1	Day	Dry	SSOGis
867009500	5	09/13/2016	1650	Angle	0	0	1	Day	Dry	SSOGis
865294820	6	08/21/2016	1000	Angle	0	0	1	Day	Dry	SSOGis
868866790	7	04/28/2017	1535	Angle	0	0	1	Day	Dry	SSOGis
873107440	8	06/16/2017	0901	Angle	0	0	1	Day	Dry	SSOGis
868955000	9	04/09/2017	1640	Angle	0	0	1	Day	Dry	SSOGis
876499060	10	09/18/2018	0823	Angle	1	6	0	Day	Dry	SSOGis
86894927	11	3/17/2017	1339	Angle	0	0	1	Day	Dry	S4
86895628	12	3/20/2017	1825	Angle	0	0	1	Day	Dry	S4
87630295	13	4/15/2018	1300	Angle	0	0	1	Day	Dry	S4
87642273	14	7/5/2018	1752	Rear End	0	0	1	Day	Dry	S4
87657546	15	10/17/2018	1728	Angle	0	1	0	Day	Dry	S4
87656392	16	10/29/2018	825	Angle	0	0	1	Day	Dry	S4
88861988	17	1/29/2019	1502	Head On	0	0	1	Day	Dry	S4
88861893	18	2/3/2019	1201	Angle	0	1	0	Night	Dry	S4
87651069	19	2/3/2019	1335	Head On	0	0	1	Day	Dry	S4
88868796	20	3/16/2019	1908	Angle	0	0	1	Night	Dry	S4
88871241	21	4/6/2019	1540	Angle	0	0	1	Day	Dry	S4
89510500	22	12/13/2019	2046	Angle	0	2	0	Night	Dry	S4
89524493	23	4/15/2020	1216	Angle	0	1	0	Day	Dry	S4
89531533	24	7/2/2020	1758	Angle	0	2	0	Day	Dry	S4
89532619	25	7/10/2020	1718	Angle	0	0	1	Day	Wet	S4
89539649	26	10/10/2020	1325	Angle	0	2	0	Day	Dry	S4
89546402	27	12/10/2020	1437	Angle	0	0	1	Day	Dry	S4

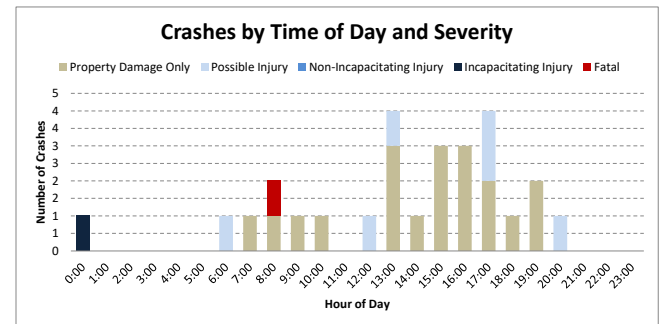
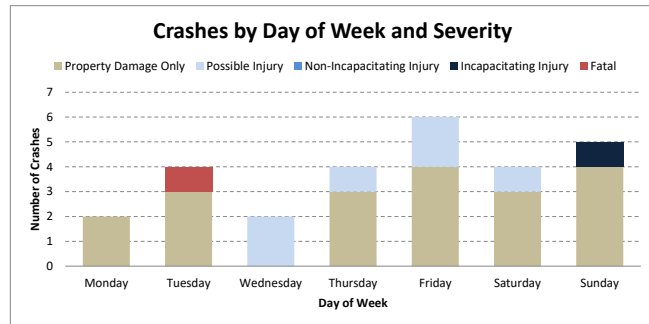
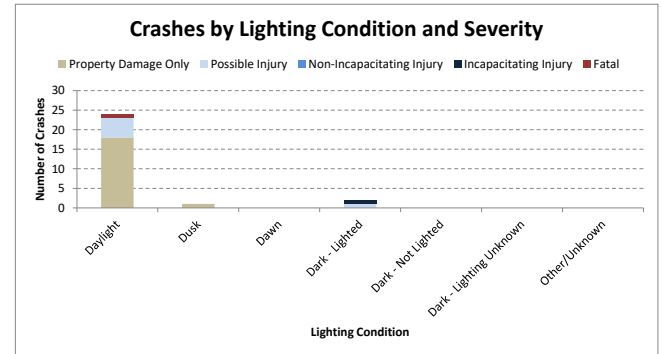
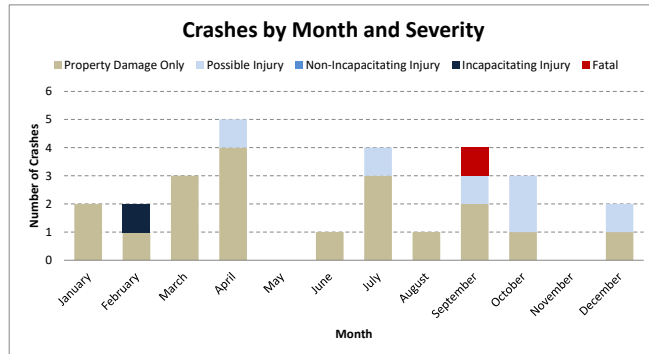
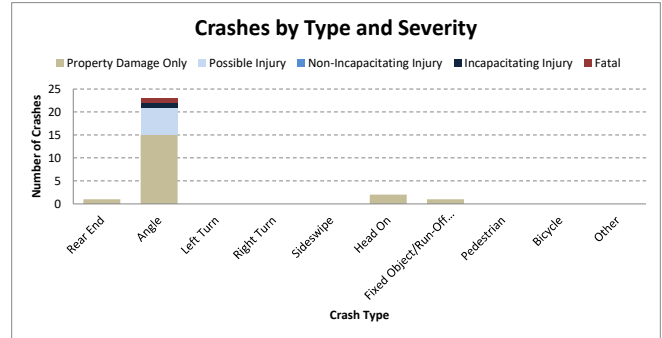
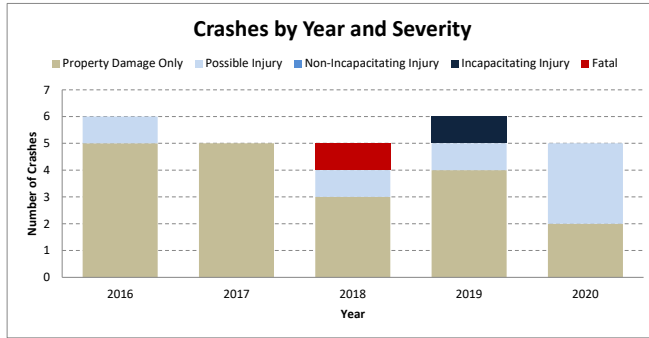
CRASH ANALYSIS - N MIAMI AVENUE & N 163 STREET

		Analysis Year					Severity					Total	Average	Percent
		2016	2017	2018	2019	2020	Property Damage Only	Possible Injury	Non-Incapacitating Injury	Incapacitating Injury	Fatal			
Type of Crash	Rear End	0	0	1	0	0	1	0	0	0	0	1	0.2	3.7%
	Angle	5	5	4	4	5	15	6	0	1	1	23	4.6	85.2%
	Left Turn	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Right Turn	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Sideswipe	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Head On	0	0	0	2	0	2	0	0	0	0	2	0.4	7.4%
	Fixed Object/Run-Off Road	1	0	0	0	0	1	0	0	0	0	1	0.2	3.7%
	Pedestrian	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Bicycle	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Other	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
Total Crashes		6	5	5	6	5	19	6	0	1	1	27	5.4	100.0%
Crash Severity	Property Damage Only	5	5	3	4	2						19	3.8	70.4%
	Possible Injury	1	0	1	1	3						6	1.2	22.2%
	Non-Incapacitating Injury	0	0	0	0	0						0	0.0	0.0%
	Incapacitating Injury	0	0	0	1	0						1	0.2	3.7%
	Fatal	0	0	1	0	0						1	0.2	3.7%
Light Conditions	Daylight	6	5	5	3	5	18	5	0	0	1	24	4.8	88.9%
	Dusk	0	0	0	1	0	1	0	0	0	0	1	0.2	3.7%
	Dawn	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Dark - Lighted	0	0	0	2	0	0	1	0	1	0	2	0.4	7.4%
	Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Dark - Lighting Unknown	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Other/Unknown	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
Road Surface Condition	Dry	5	5	5	6	4	17	6	0	1	1	25	5.0	92.6%
	Wet	1	0	0	0	1	2	0	0	0	0	2	0.4	7.4%
	Other	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
Month	January	1	0	0	1	0	2	0	0	0	0	2	0.4	7.4%
	February	0	0	0	2	0	1	0	0	1	0	2	0.4	7.4%
	March	0	2	0	1	0	3	0	0	0	0	3	0.6	11.1%
	April	0	2	1	1	1	4	1	0	0	0	5	1.0	18.5%
	May	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	June	0	1	0	0	0	1	0	0	0	0	1	0.2	3.7%
	July	1	0	1	0	2	3	1	0	0	0	4	0.8	14.8%
	August	1	0	0	0	0	1	0	0	0	0	1	0.2	3.7%
	September	3	0	1	0	0	2	1	0	0	1	4	0.8	14.8%
	October	0	0	2	0	1	1	2	0	0	0	3	0.6	11.1%
	November	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	December	0	0	0	1	1	1	1	0	0	0	2	0.4	7.4%
Day of Week	Monday	0	1	1	0	0	2	0	0	0	0	2	0.4	7.4%
	Tuesday	2	0	1	1	0	3	0	0	0	1	4	0.8	14.8%
	Wednesday	0	0	1	0	1	0	2	0	0	0	2	0.4	7.4%
	Thursday	1	0	1	0	2	3	1	0	0	0	4	0.8	14.8%
	Friday	1	3	0	1	1	4	2	0	0	0	6	1.2	22.2%
	Saturday	1	0	0	2	1	3	1	0	0	0	4	0.8	14.8%
	Sunday	1	1	1	2	0	4	0	0	1	0	5	1.0	18.5%

CRASH ANALYSIS - N MIAMI AVENUE & N 163 STREET

		Analysis Year					Severity					Total	Average	Percent
		2016	2017	2018	2019	2020	Property Damage Only	Possible Injury	Non-Incapacitating Injury	Incapacitating Injury	Fatal			
Hour of Day	0:00	0	0	0	1	0	0	0	0	1	0	1	0.2	3.7%
	1:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	2:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	3:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	4:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	5:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	6:00	1	0	0	0	0	0	1	0	0	0	1	0.2	3.7%
	7:00	1	0	0	0	0	1	0	0	0	0	1	0.2	3.7%
	8:00	0	0	2	0	0	1	0	0	0	1	2	0.4	7.4%
	9:00	0	1	0	0	0	1	0	0	0	0	1	0.2	3.7%
	10:00	1	0	0	0	0	1	0	0	0	0	1	0.2	3.7%
	11:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	12:00	0	0	0	0	1	0	1	0	0	0	1	0.2	3.7%
	13:00	0	1	1	1	1	3	1	0	0	0	4	0.8	14.8%
	14:00	0	0	0	0	1	1	0	0	0	0	1	0.2	3.7%
	15:00	0	1	0	2	0	3	0	0	0	0	3	0.6	11.1%
	16:00	2	1	0	0	0	3	0	0	0	0	3	0.6	11.1%
	17:00	0	0	2	0	2	2	2	0	0	0	4	0.8	14.8%
	18:00	0	1	0	0	0	1	0	0	0	0	1	0.2	3.7%
	19:00	1	0	0	1	0	2	0	0	0	0	2	0.4	7.4%
	20:00	0	0	0	1	0	0	1	0	0	0	1	0.2	3.7%
	21:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	22:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	23:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
Time Period	12AM-6AM	0	0	0	1	0	0	0	0	1	0	1	0.2	3.7%
	6AM-12PM	3	1	2	0	0	4	1	0	0	1	6	1.2	22.2%
	12PM-6PM	2	3	3	3	5	12	4	0	0	0	16	3.2	59.3%
	6PM-12AM	1	1	0	2	0	3	1	0	0	0	4	0.8	14.8%
Alcohol & Drugs	None	6	5	5	6	5	19	6	0	1	1	27	5.4	100.0%
	Alcohol Involved	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Drugs Involved	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Alcohol and Drugs	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Undetermined	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
Age of Driver 1 (Typically Driver at Fault)	19 and Under	0	0	0	0	0						0	0.0	0.0%
	20-24	0	0	0	0	0						0	0.0	0.0%
	25-29	0	0	0	0	0						0	0.0	0.0%
	30-34	0	0	0	0	0						0	0.0	0.0%
	35-39	0	0	0	0	0						0	0.0	0.0%
	40-44	0	0	0	0	0						0	0.0	0.0%
	45-49	0	0	0	0	0						0	0.0	0.0%
	50-54	0	0	0	0	0						0	0.0	0.0%
	55-59	0	0	0	0	0						0	0.0	0.0%
	60-64	0	0	0	0	0						0	0.0	0.0%
	65-69	0	0	0	0	0						0	0.0	0.0%
	70-74	0	0	0	0	0						0	0.0	0.0%
	75-79	0	0	0	0	0						0	0.0	0.0%
	80-84	0	0	0	0	0						0	0.0	0.0%
	85 and Over	0	0	0	0	0						0	0.0	0.0%
	Unknown	0	0	0	0	0						0	0.0	0.0%

CRASH ANALYSIS - N MIAMI AVENUE & N 163 STREET



APPENDIX E. SIGNAL WARRANT ANALYSIS

TRAFFIC SIGNAL WARRANT SUMMARY

Introduction

- The Signal Warrant Analysis Spreadsheets are a tool for assisting traffic engineers when evaluating the need for a traffic signal installation
- The filled spreadsheets can be used as part of the supporting documents for the signal warrant evaluation

Note: This templates are a useful resource, but it remains necessary to apply engineering judgment and to consider specific environmental, traffic, geometric, and operational conditions

Instructions

Fill in "Orange" areas only

*Automated cells based on in
Input Data in "orange" cells*

General Information

Fill in below the general information including:

District, County (drop-down menu)

City, Engineer, Date

Major and Minor Street with corresponding number of lanes and speed limits

Enter Eight Hour Volumes

Any 8 hours of an average day. Major-street and minor-street volumes shall be for the same 8 hours; however, the 8 hours satisfied in Condition A shall **not** be required to be the same 8 hours satisfied in Condition B **for 80% columns only**. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.

Enter Four Hour Volumes

Any 4 hours of an average day. Vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only, not required to be on the same approach during each of the 4 hours)

Enter Pedestrian Volumes (4-~~1~~ Pedestrians per hour crossing the major street (total of all crossings)

Enter Peak Hour Volumes

Vehicular: Any four consecutive 15-minute periods of an average day

Pedestrian: Any four consecutive 15-minute periods of an average day representing the vehicles per hour on the major street (total of both approaches) and the corresponding pedestrians per hour crossing the major street (total of all crossings)

Input DataForm 750-020-01
TRAFFIC ENGINEERING
October 2020City: **Miami**
County: **87 – Miami Dade**
District: **Six**Engineer:
Date: **March 31, 2021**Major Street: **N Miami Ave**
Minor Street: **NW 163 St**Major Street # Lanes: **2**
Minor Street # Lanes: **2**Major Approach Speed: **30**
Minor Approach Speed: **30**

Eight Hour Volumes (Condition A)			For Warrant 7
Hours	Major Street (total of both approaches)	Minor Street (one direction only)	Ped Crossings on Major Street
7:30 AM	415	52	
8:30 AM	416	44	
1:00 PM	381	67	
2:00 PM	478	117	
3:00 PM	496	130	
4:00 PM	532	150	
5:00 PM	556	152	
6:00 PM	519	74	

Eight Hour Volumes (Condition B)		
Hours	Major Street (total of both approaches)	Minor Street (one direction only)
7:30 AM	415	52
8:30 AM	416	44
1:00 PM	381	67
2:00 PM	478	117
3:00 PM	496	130
4:00 PM	532	150
5:00 PM	556	152
6:00 PM	519	74

Highest Four Hour Vehicular Volumes		
Hours	Major Street (total of both approaches)	Minor Street (one direction only)
2:00 PM	478	117
3:00 PM	496	130
4:00 PM	532	150
5:00 PM	556	152

Highest Four Hour Pedestrian Volumes		
Hours	Major Street (total of both approaches)	Pedestrian Crossings on Major Street

Vehicular Peak Hour Volumes			
Peak Hour	Major Street (total of both approaches)	Minor Street (one direction only)	Total Entering Volume
5:00 PM	556	152	750

Pedestrian Peak Hour Volumes		
Peak Hour	Major Street (total of both approaches)	Pedestrian Crossing Volumes on Major Street

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

Form 750-020-01
TRAFFIC ENGINEERING
October 2020

City: **Miami**
County: **87 – Miami Dade**
District: **Six**

Engineer: _____
Date: **March 31, 2021**

Major Street: **N Miami Ave** Lanes: **2** Major Approach Speed: **30**
Minor Street: **NW 163 St** Lanes: **2** Minor Approach Speed: **30**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☐ Yes ☒ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☒ No
- "70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☐ MAY ☐ 70% ☒ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied for eight hours. ☐ Yes ☒ No

Warrant 1 is also satisfied if both Condition A and Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems). ☐ Yes ☒ No

Warrant 1 is satisfied if Condition A or Condition B is "70%" satisfied for eight hours. ☐ Yes ☒ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable: ☒ Yes ☐ No
100% Satisfied: ☐ Yes ☒ No
80% Satisfied: ☐ Yes ☒ No
70% Satisfied: ☐ Yes ☒ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100% ^a	80% ^b	70% ^c	100% ^a	80% ^b	70% ^c
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

^a Basic Minimum hourly volume

^b Used for combination of Conditions A and B after adequate trial of other remedial measures

^c May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:30 AM	8:30 AM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM
Major	415	416	381	478	496	532	556	519
Minor	52	44	67	117	130	150	152	74

Existing Volumes

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

Form 750-020-01
TRAFFIC ENGINEERING
October 2020

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:

☒ Yes ☐ No

100% Satisfied:

☐ Yes ☒ No

80% Satisfied:

☐ Yes ☒ No

70% Satisfied:

☐ Yes ☒ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100% ^a	80% ^b	70% ^c	100% ^a	80% ^b	70% ^c
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

^a Basic Minimum hourly volume

^b Used for combination of Conditions A and B after adequate trial of other remedial measures

^c May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	7:30 AM	8:30 AM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM
Major	415	416	381	478	496	532	556	519
Minor	52	44	67	117	130	150	152	74

Existing Volumes

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

Form 750-020-01
TRAFFIC ENGINEERING
October 2020

City: **Miami**
County: **87 – Miami Dade**
District: **Six**

Engineer: _____
Date: **March 31, 2021**

Major Street: **N Miami Ave** Lanes: **2** Major Approach Speed: **30**
Minor Street: **NW 163 St** Lanes: **2** Minor Approach Speed: **30**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph?
2. Is the intersection in a built-up area of an isolated community with a population < 10,000?

☐ Yes ☒ No

☐ Yes ☒ No

"70%" volume level **may** be used if Question 1 or 2 above is answered "Yes"

☐ MAY

☐ 70% ☒ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

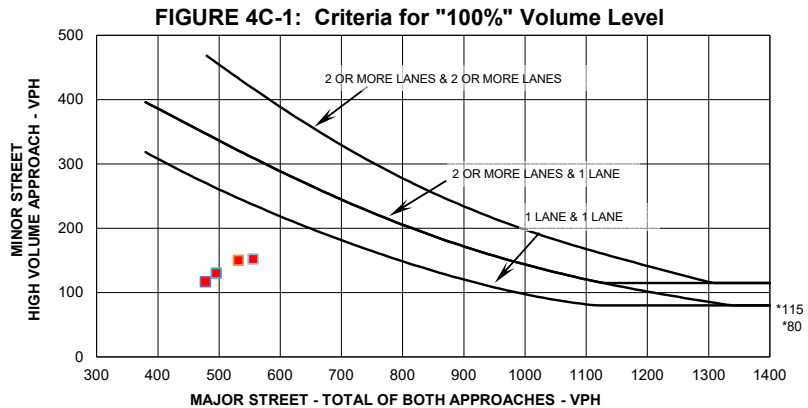
Applicable: ☒ Yes ☐ No

Satisfied: ☐ Yes ☒ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

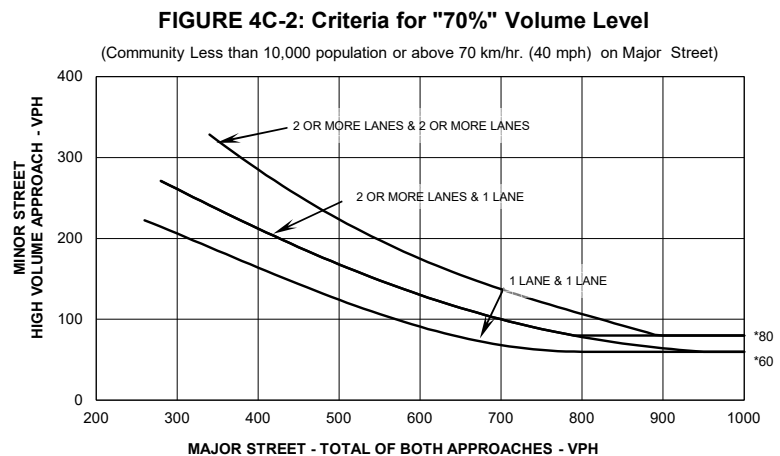
Four Highest Hours	Volumes	
	Major Street	Minor Street
2:00 PM	478	117
3:00 PM	496	130
4:00 PM	532	150
5:00 PM	556	152



* Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street



* Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.

State of Florida Department of Transportation
TRAFFIC SIGNAL WARRANT SUMMARY

Form 750-020-01
TRAFFIC ENGINEERING
October 2020

City: **Miami**
County: **87 – Miami Dade**
District: **Six**

Engineer: _____
Date: **March 31, 2021**

Major Street: **N Miami Ave**
Minor Street: **NW 163 St**

Lanes: **2** Major Approach Speed: **30**
Lanes: **2** Minor Approach Speed: **30**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph?
2. Is the intersection in a built-up area of an isolated community with a population < 10,000?

☐ Yes ☒ No

☐ Yes ☒ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes"

☐ MAY

☐ 70% ☒ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☐ Yes ☒ No

Satisfied: ☐ Yes ☐ No

Unusual condition justifying use of warrant:

Industrial Complex

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
5:00 PM	556	152

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.

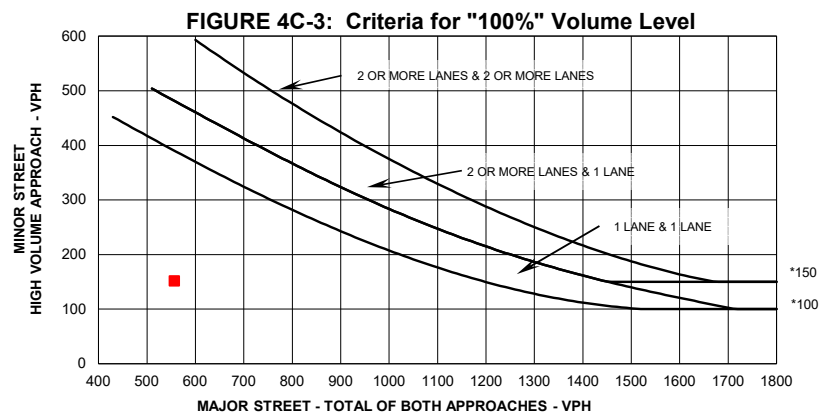
Criteria

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

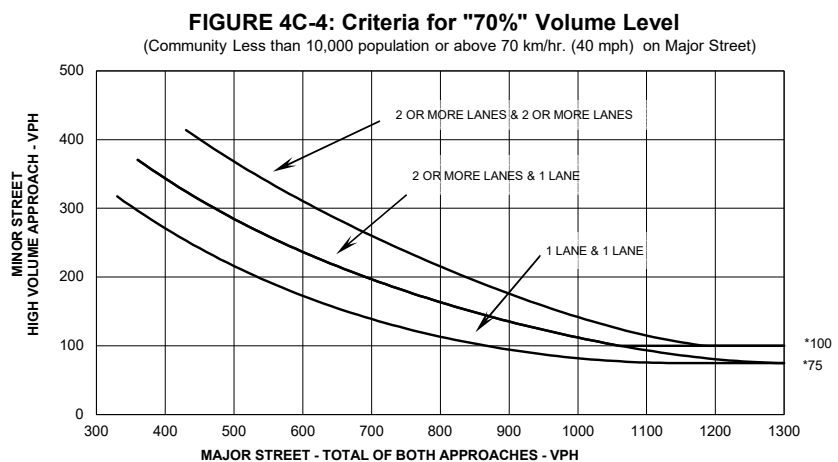
2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



* Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.

State of Florida Department of Transportation
TRAFFIC SIGNAL WARRANT SUMMARY

Form 750-020-01
TRAFFIC ENGINEERING
October 2020

City: **Miami**
County: **87 – Miami Dade**
District: **Six**

Engineer: _____
Date: **March 31, 2021**

Major Street: **N Miami Ave** Lanes: **2** Major Approach Speed: **30**
Minor Street: **NW 163 St** Lanes: **2** Minor Approach Speed: **30**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 35 mph? ☐ Yes ☒ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☒ No
- "70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☐ MAY ☐ 70% ☒ 100%

Option

*Pedestrian volume crossing the major street **may** be reduced as much as 50% if the 15th-percentile crossing speed of pedestrians is less than 3.5 ft/sec. A walking speed study was conducted which reported a pedestrian speed less than 3.5 ft/sec for the 15th percentile.*

☐ Yes ☐ No

WARRANT 4 - PEDESTRIAN VOLUME

For each of any 4 hours of an average day, the plotted points lie above the appropriate line, then the warrant is satisfied.

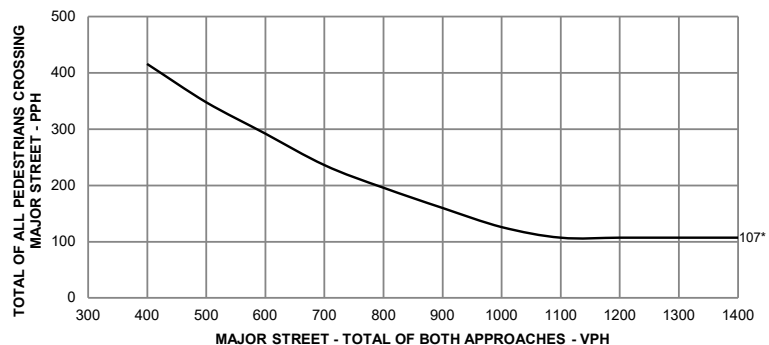
Applicable: ☐ Yes ☒ No
Satisfied: ☐ Yes ☒ No

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Pedestrian Total

Plot four volume combinations on the applicable figure below.

Figure 4C-5. Criteria for "100%" Volume Level

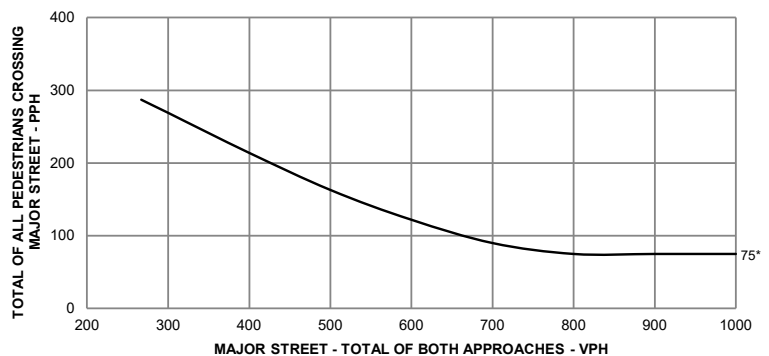


* Note: 107 pph applies as the lower threshold volume for 100% volume level

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Pedestrian Total

Figure 4C-6 Criteria for "70%" Volume Level



* Note: 75 pph applies as the lower threshold volume for 70% volume level

WARRANT 4 - PEDESTRIAN VOLUME

For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point falls above the appropriate line, then the warrant is satisfied.

Applicable: ☐ Yes ☐ No

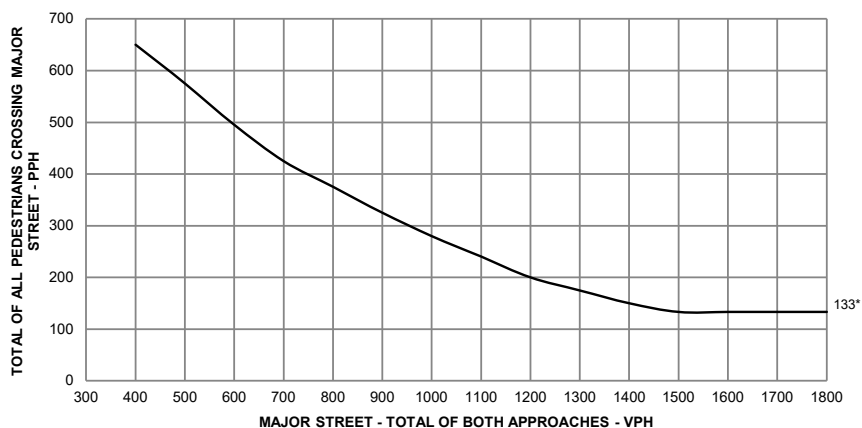
Satisfied: ☐ Yes ☐ No

Plot one volume combination on the applicable figure below.

100% Volume Level

Peak Hour	Volumes	
	Major Street	Pedestrian Total

Figure 4C-7. Criteria for "100%" Volume Level - Peak Hour

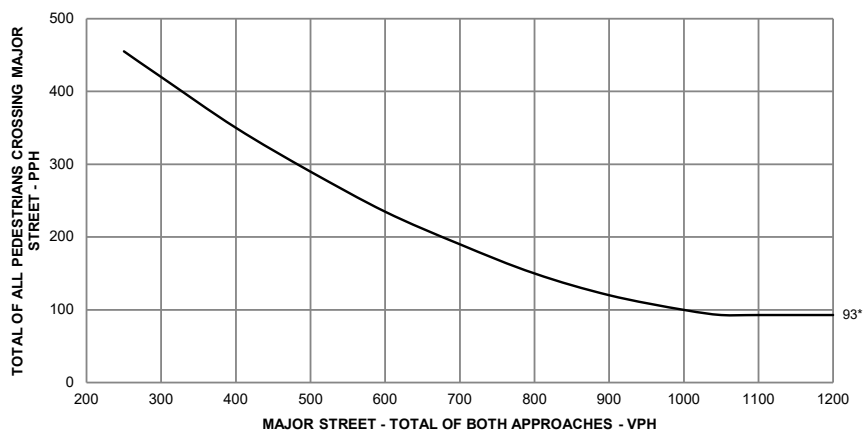


* Note: 133 pph applies as the lower threshold volume

70% Volume Level

Peak Hour	Volumes	
	Major Street	Pedestrian Total

Figure 4C-8 Criteria for "70%" Volume Level - Peak Hour



* Note: 93 pph applies as the lower threshold volume

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

Form 750-020-01
TRAFFIC ENGINEERING
October 2020

City: **Miami**
County: **87 – Miami Dade**
District: **Six**

Engineer: _____
Date: **March 31, 2021**

Major Street: N Miami Ave	Lanes: 2	Major Approach Speed: 30
Minor Street: NW 163 St	Lanes: 2	Minor Approach Speed: 30

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

WARRANT 5 - SCHOOL CROSSING

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Applicable: ☐ Yes ☒ No
Satisfied: ☐ Yes ☐ No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the established school crossing than the number of minutes in the same period.	Minutes:	Gaps:			
3. The nearest traffic signal along the major street is located more than 300 ft. (90 m) away, or the nearest signal is within 300 ft. (90 m) but the proposed traffic signal will not restrict the progressive movement of traffic.					

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

Form 750-020-01
TRAFFIC ENGINEERING
October 2020

City: **Miami**
County: **87 – Miami Dade**
District: **Six**

Engineer: _____
Date: **March 31, 2021**

Major Street: **N Miami Ave**
Minor Street: **NW 163 St**

Lanes: **2**
Lanes: **2**

Major Approach Speed: **30**
Minor Approach Speed: **30**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

WARRANT 6 - COORDINATED SIGNAL SYSTEM

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft.).

Applicable: ☐ Yes ☒ No
Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		

State of Florida Department of Transportation
TRAFFIC SIGNAL WARRANT SUMMARY

Form 750-020-01
TRAFFIC ENGINEERING
October 2020

City: **Miami**
County: **87 – Miami Dade**
District: **Six**

Engineer: _____
Date: **March 31, 2021**

Major Street: **N Miami Ave**
Minor Street: **NW 163 St**

Lanes: **2** Major Approach Speed: **30**
Lanes: **2** Minor Approach Speed: **30**

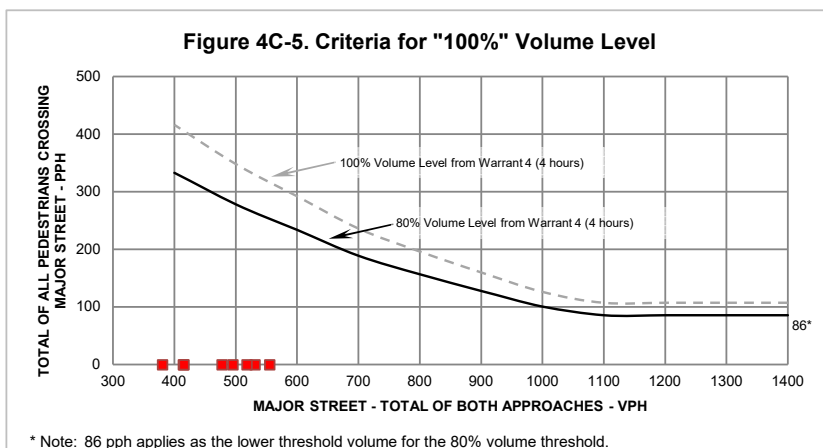
MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

WARRANT 7 - CRASH EXPERIENCE

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if **all three** of the criteria are fulfilled.

Applicable: ☒ Yes ☐ No
Satisfied: ☐ Yes ☒ No

Criteria					Fulfilled?	
					Yes	No
1.	Adequate trial of other remedial measure has failed to reduce crash frequency.	Measure tried:				x
2.	Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-month period.	Observed Crash Types:	Angle	Number of crashes per 12 months:	5	x
3.	One of the following volume warrants is met:				Met?	No
	Warrant 1, Condition A (80% satisfied), or				No	
	Warrant 1, Condition B (80% satisfied), or				No	
		Hour	Major Street Volume	Ped Crossings Volume		
		7:30 AM	415			
		8:30 AM	416			
		1:00 PM	381			
		2:00 PM	478			
		3:00 PM	496			
		4:00 PM	532			
		5:00 PM	556			
		6:00 PM	519			
	Warrant 4, Pedestrian Volume satisfied at 80% of volume requirements for any 8 hours of an average day.					



TRAFFIC SIGNAL WARRANT SUMMARY

City: **Miami**
 County: **87 – Miami Dade**
 District: **Six**

Engineer: _____
 Date: **March 31, 2021**

Major Street: **N Miami Ave**
 Minor Street: **NW 163 St**

Lanes: **2** Major Approach Speed: **30**
 Lanes: **2** Minor Approach Speed: **30**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

WARRANT 8 - ROADWAY NETWORK

Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the Major Route characteristics listed.

Applicable: ☐ Yes ☒ No

Satisfied: ☐ Yes ☐ No

Criteria						Met?		Fulfilled?		
						Yes	No	Yes	No	
1. Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.				Entering Volume:					
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.				Warrant:	1	2	3		
					Satisfied?:					
2. Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)							← Hour			
							← Volume			

Characteristics of Major Routes						Met?		Fulfilled?	
						Yes	No	Yes	No
1. Part of the street or highway system that serves as the principal roadway network for through traffic flow.	Major Street:								
	Minor Street:								
2. Rural or suburban highway outside of, entering, or traversing a city.	Major Street:								
	Minor Street:								
3. Appears as a major route on an official plan.	Major Street:								
	Minor Street:								

TRAFFIC SIGNAL WARRANT SUMMARY

City: **Miami**
 County: **87 – Miami Dade**
 District: **Six**

Engineer: _____
 Date: **March 31, 2021**

Major Street: **N Miami Ave**
 Minor Street: **NW 163 St**

Lanes: **2** Major Approach Speed: **30**
 Lanes: **2** Minor Approach Speed: **30**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

Approach Lane Criteria

1. How many approach lanes are there at the track crossing?

☒ 1 ☐ 2 or more

If there is 1 lane, use Figure 4C-9 and if there are 2 or more, use Figure 4C-10.

☒ Fig 4C-9 ☐ Fig 4C-10

WARRANT 9 - INTERSECTION NEAR A GRADE CROSSING

This signal warrant should be applied only after adequate consideration has been given to other alternatives or after a trial of an alternative has failed to alleviate the safety concerns associated with the grade crossing.

Indicate if both criteria are fulfilled in the boxes provided. The warrant is satisfied if both criteria are met.

Applicable: ☐ Yes ☒ No
 Satisfied: ☐ Yes ☐ No

Criteria	Fulfilled?	
	Yes	No
1. A grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approach; and	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. During the highest traffic volume hour during which the rail uses the crossing, the plotted point falls above the applicable curve for the existing combination of approach lanes over the track and the distance D (clear storage distance).	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Use the following tables (4C-2, 4C-3, and 4C-4 to appropriately adjust the minor-street approach volume).

Inputs

Occurrences of Rail traffic per day
 % of High Occupancy Buses on Approach Lane at Track Crossing
 Enter D (feet)
 % of Tractor-Trailer Trucks on Approach Lane at Track Crossing

Adjustment Factors from Tables

	1.00
	0.50

Table 4C-2. Adjustment Factor for Daily Frequency of Rail Traffic

Rail Traffic per Day	Adjustment Factor
1	0.67
2	0.91
3 to 5	1.00
6 to 8	1.18
9 to 11	1.25
12 or more	1.33

Table 4C-3. Adjustment Factor for Percentage of High-Occupancy Buses

% of High-Occupancy Buses* on Minor Street Approach	Adjustment Factor
0%	1.00
2%	1.09
4%	1.19
6% or more	1.32

* A high-occupancy bus is defined as a bus occupied by at least 20 people

Table 4C-4. Adjustment Factor for Percentage of Tractor-Trailer Trucks

% of Tractor-Trailer Trucks on Minor-Street Approach	Adjustment Factor	
	D less than 70 feet	D of 70 feet or more
0% to 2.5%	0.50	0.50
2.6% to 7.5%	0.75	0.75
7.6% to 12.5%	1.00	1.00
12.6% to 17.5%	2.30	1.15
17.6% to 22.5%	2.70	1.35
22.6% to 27.5%	3.28	1.64
More than 27.5%	4.18	2.09

Input the major and minor street volumes before adjustment factors are applied

1 Approach Lane		
D (ft)	Major Vol.	Minor Vol.

After adjustment factors are applied

1 Approach Lane w/Factors		
D (ft)	Major Vol.	Minor Vol.

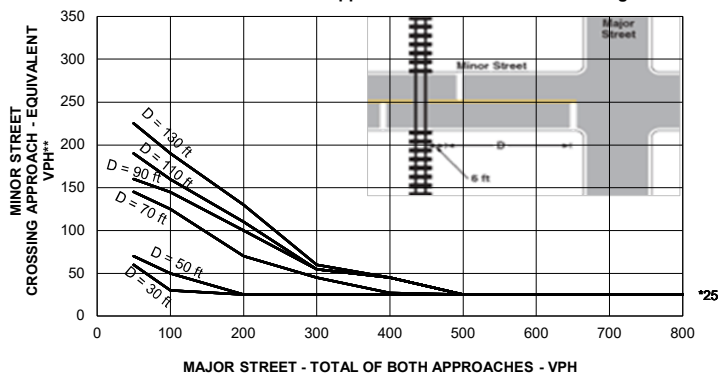
Input D and the major and minor street volumes before adjustment factors are applied

2 or more Approach Lanes		
D (ft)	Major Vol.	Minor Vol.

After adjustment factors are applied

2+ Approach Lane w/Factors		
D (ft)	Major Vol.	Minor Vol.

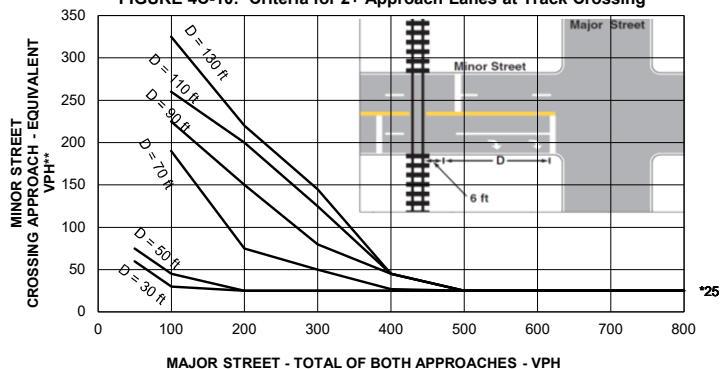
FIGURE 4C-9: Criteria for 1 Approach Lane at the Track Crossing



* Note: 25 vph applies as the lower threshold volume

* *Note: VPH after applying the adjustment factors in Tables 4C-2, 4C, and/or 4C-4, if appropriate

FIGURE 4C-10: Criteria for 2+ Approach Lanes at Track Crossing



* Note: 25 vph applies as the lower threshold volume

* *Note: VPH after applying the adjustment factors in Tables 4C-2, 4C, and/or 4C-4, if appropriate

State of Florida Department of Transportation

TRAFFIC SIGNAL WARRANT SUMMARY

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TRAFFIC ENGINEERING
October 2020

City: **Miami**
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District: **Six**

Engineer: _____
Date: **March 31, 2021**

Major Street: **N Miami Ave**
Minor Street: **NW 163 St**

Lanes: **2**
Lanes: **2**

Major Approach Speed: **30**
Minor Approach Speed: **30**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

CONCLUSIONS

Remarks: _____

WARRANTS SATISFIED:

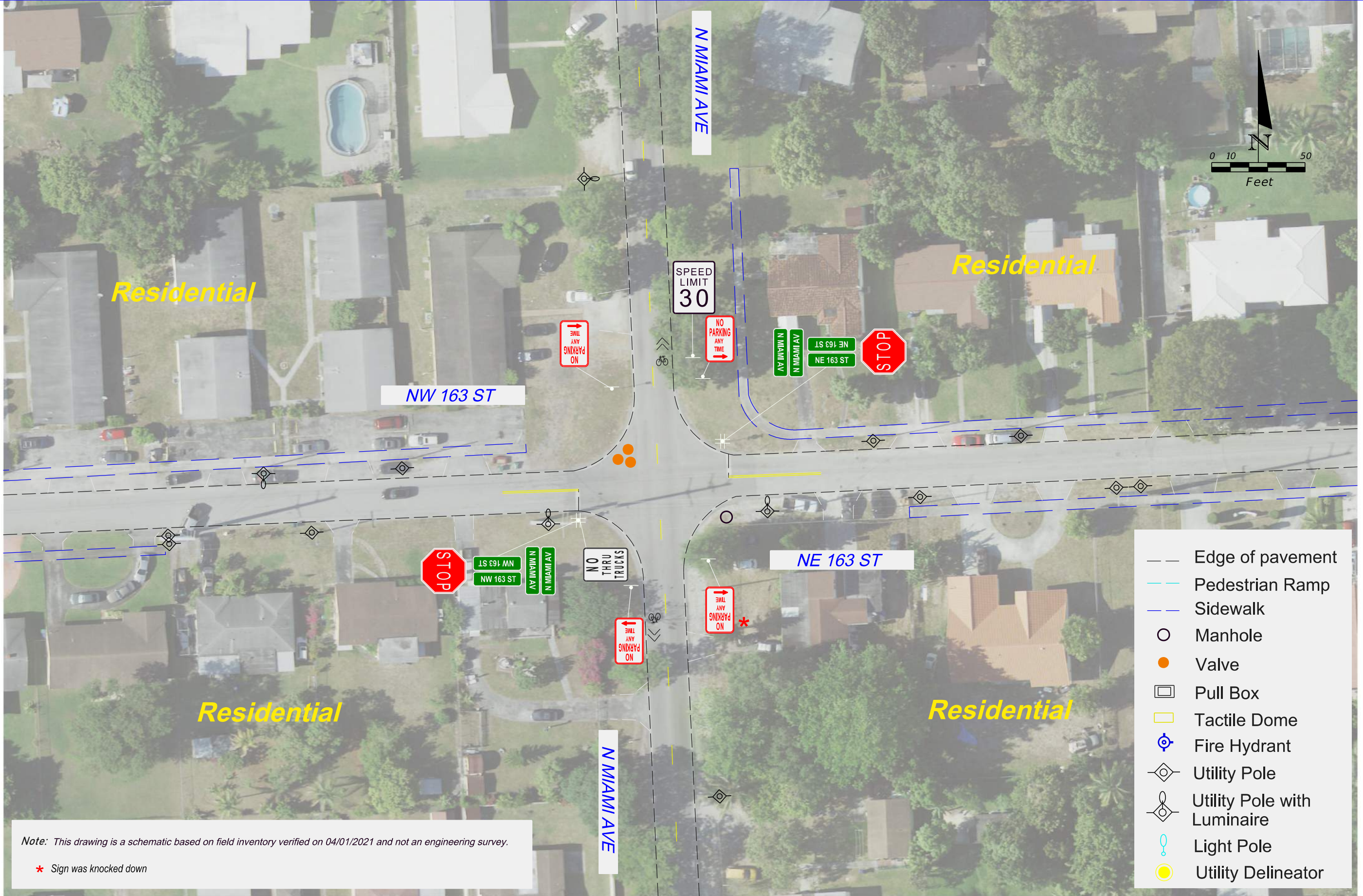
Warrant 1	<input type="checkbox"/> Not Applicable	<input type="checkbox"/> Met	<input checked="" type="checkbox"/> Not Met
Warrant 2	<input type="checkbox"/> Not Applicable	<input type="checkbox"/> Met	<input checked="" type="checkbox"/> Not Met
Warrant 3	<input checked="" type="checkbox"/> Not Applicable	<input type="checkbox"/> Met	<input type="checkbox"/> Not Met
Warrant 4	<input checked="" type="checkbox"/> Not Applicable	<input type="checkbox"/> Met	<input type="checkbox"/> Not Met
Warrant 5	<input checked="" type="checkbox"/> Not Applicable	<input type="checkbox"/> Met	<input type="checkbox"/> Not Met
Warrant 6	<input checked="" type="checkbox"/> Not Applicable	<input type="checkbox"/> Met	<input type="checkbox"/> Not Met
Warrant 7	<input type="checkbox"/> Not Applicable	<input type="checkbox"/> Met	<input checked="" type="checkbox"/> Not Met
Warrant 8	<input checked="" type="checkbox"/> Not Applicable	<input type="checkbox"/> Met	<input type="checkbox"/> Not Met
Warrant 9	<input checked="" type="checkbox"/> Not Applicable	<input type="checkbox"/> Met	<input type="checkbox"/> Not Met

APPENDIX F. ICE STAGE 1

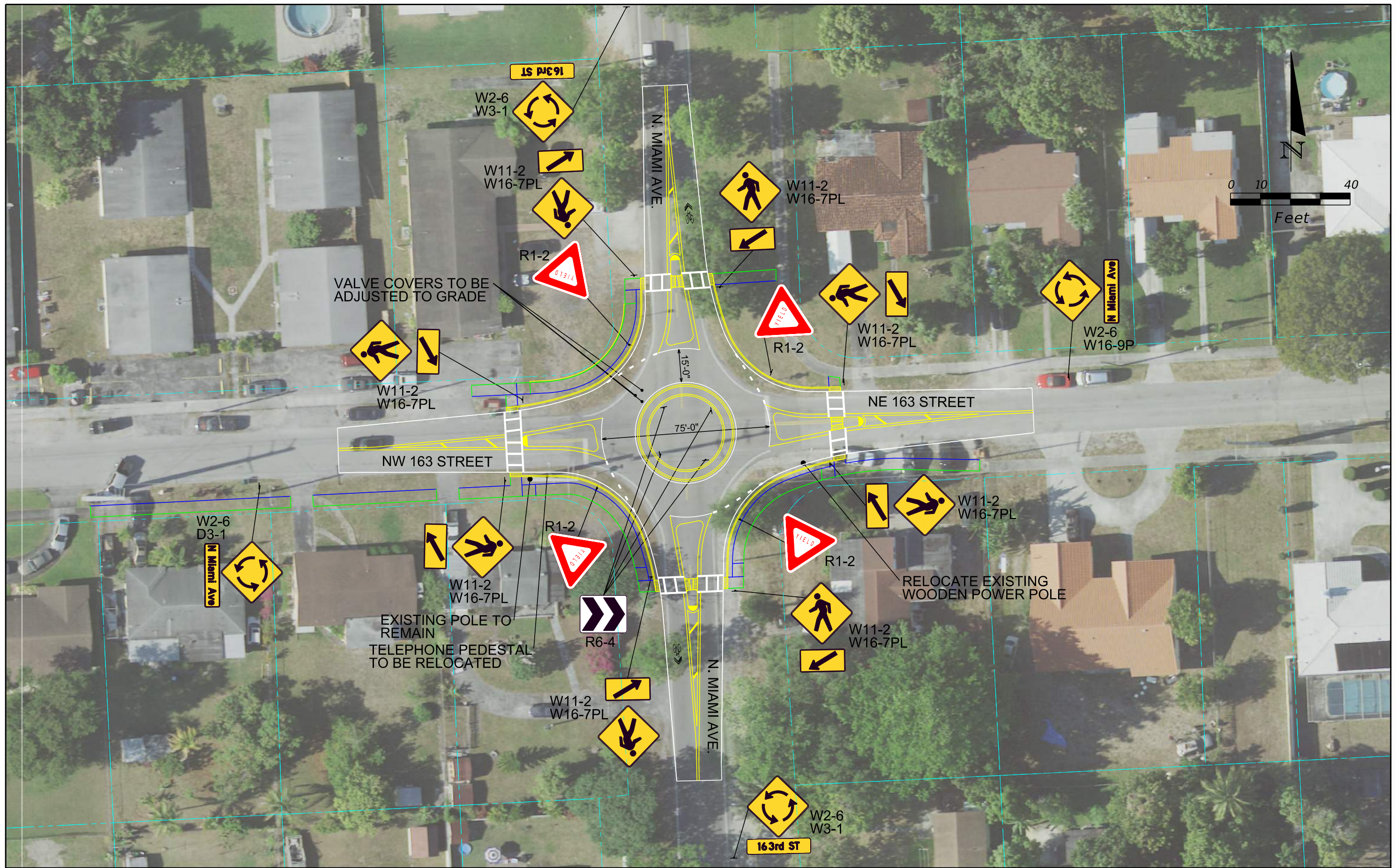
Existing Conditions

Intersection: N Miami Avenue @ N 163 Street

Location: Miami-Dade County – D6



Proposed Concept Design



REVISIONS					MIAMI-DADE TRANSPORTATION PLANNING ORGANIZATION	<i>N. MIAMI AVE. & NE 163 STREET ROUNDBOUT CONCEPT</i>	FIGURE NO. 8
DATE	DESCRIPTION	DATE	DESCRIPTION				

Crash Summary

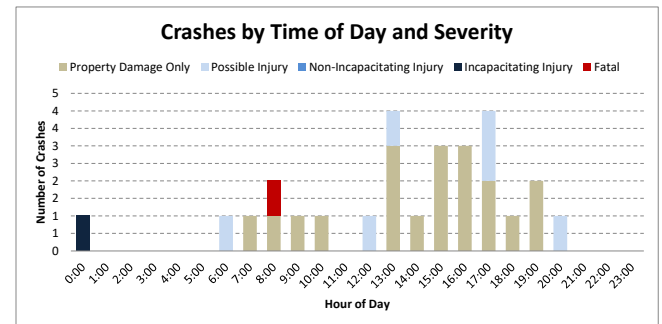
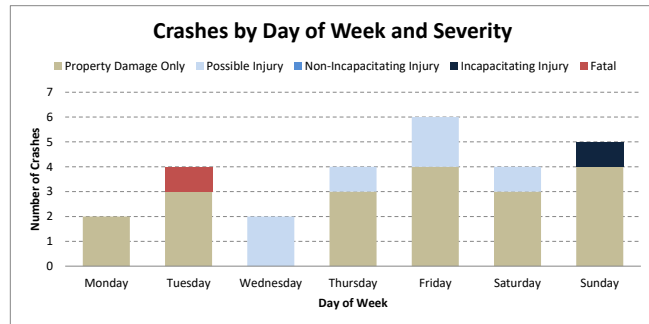
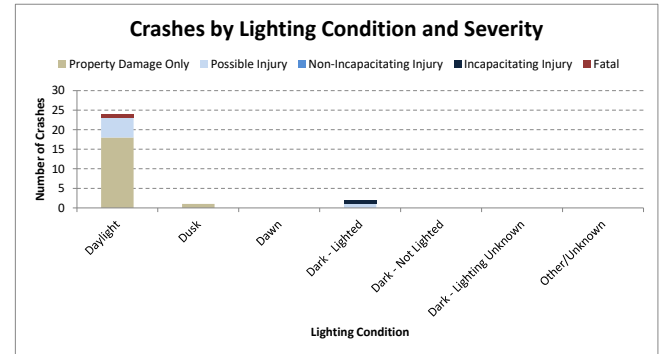
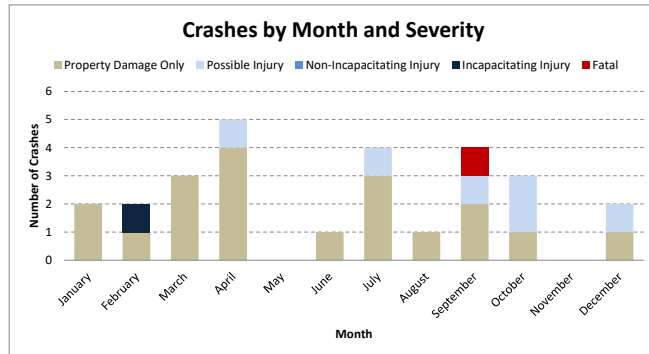
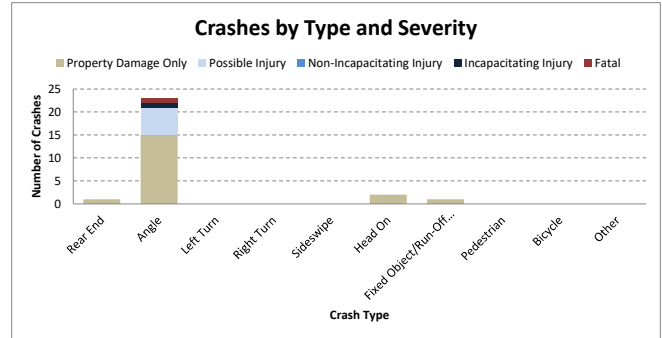
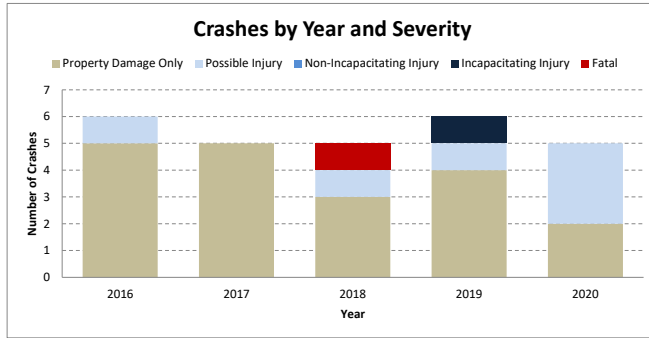
CRASH ANALYSIS - N MIAMI AVENUE & N 163 STREET

		Analysis Year					Severity					Total	Average	Percent
		2016	2017	2018	2019	2020	Property Damage Only	Possible Injury	Non-Incapacitating Injury	Incapacitating Injury	Fatal			
Type of Crash	Rear End	0	0	1	0	0	1	0	0	0	0	1	0.2	3.7%
	Angle	5	5	4	4	5	15	6	0	1	1	23	4.6	85.2%
	Left Turn	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Right Turn	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Sideswipe	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Head On	0	0	0	2	0	2	0	0	0	0	2	0.4	7.4%
	Fixed Object/Run-Off Road	1	0	0	0	0	1	0	0	0	0	1	0.2	3.7%
	Pedestrian	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Bicycle	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Other	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
Total Crashes		6	5	5	6	5	19	6	0	1	1	27	5.4	100.0%
Crash Severity	Property Damage Only	5	5	3	4	2						19	3.8	70.4%
	Possible Injury	1	0	1	1	3						6	1.2	22.2%
	Non-Incapacitating Injury	0	0	0	0	0						0	0.0	0.0%
	Incapacitating Injury	0	0	0	1	0						1	0.2	3.7%
	Fatal	0	0	1	0	0						1	0.2	3.7%
Light Conditions	Daylight	6	5	5	3	5	18	5	0	0	1	24	4.8	88.9%
	Dusk	0	0	0	1	0	1	0	0	0	0	1	0.2	3.7%
	Dawn	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Dark - Lighted	0	0	0	2	0	0	1	0	1	0	2	0.4	7.4%
	Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Dark - Lighting Unknown	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Other/Unknown	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
Road Surface Condition	Dry	5	5	5	6	4	17	6	0	1	1	25	5.0	92.6%
	Wet	1	0	0	0	1	2	0	0	0	0	2	0.4	7.4%
	Other	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
Month	January	1	0	0	1	0	2	0	0	0	0	2	0.4	7.4%
	February	0	0	0	2	0	1	0	0	1	0	2	0.4	7.4%
	March	0	2	0	1	0	3	0	0	0	0	3	0.6	11.1%
	April	0	2	1	1	1	4	1	0	0	0	5	1.0	18.5%
	May	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	June	0	1	0	0	0	1	0	0	0	0	1	0.2	3.7%
	July	1	0	1	0	2	3	1	0	0	0	4	0.8	14.8%
	August	1	0	0	0	0	1	0	0	0	0	1	0.2	3.7%
	September	3	0	1	0	0	2	1	0	0	1	4	0.8	14.8%
	October	0	0	2	0	1	1	2	0	0	0	3	0.6	11.1%
	November	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	December	0	0	0	1	1	1	1	0	0	0	2	0.4	7.4%
Day of Week	Monday	0	1	1	0	0	2	0	0	0	0	2	0.4	7.4%
	Tuesday	2	0	1	1	0	3	0	0	0	1	4	0.8	14.8%
	Wednesday	0	0	1	0	1	0	2	0	0	0	2	0.4	7.4%
	Thursday	1	0	1	0	2	3	1	0	0	0	4	0.8	14.8%
	Friday	1	3	0	1	1	4	2	0	0	0	6	1.2	22.2%
	Saturday	1	0	0	2	1	3	1	0	0	0	4	0.8	14.8%
	Sunday	1	1	1	2	0	4	0	0	1	0	5	1.0	18.5%

CRASH ANALYSIS - N MIAMI AVENUE & N 163 STREET

		Analysis Year					Severity					Total	Average	Percent
		2016	2017	2018	2019	2020	Property Damage Only	Possible Injury	Non-Incapacitating Injury	Incapacitating Injury	Fatal			
Hour of Day	0:00	0	0	0	1	0	0	0	0	1	0	1	0.2	3.7%
	1:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	2:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	3:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	4:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	5:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	6:00	1	0	0	0	0	0	1	0	0	0	1	0.2	3.7%
	7:00	1	0	0	0	0	1	0	0	0	0	1	0.2	3.7%
	8:00	0	0	2	0	0	1	0	0	0	1	2	0.4	7.4%
	9:00	0	1	0	0	0	1	0	0	0	0	1	0.2	3.7%
	10:00	1	0	0	0	0	1	0	0	0	0	1	0.2	3.7%
	11:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	12:00	0	0	0	0	1	0	1	0	0	0	1	0.2	3.7%
	13:00	0	1	1	1	1	3	1	0	0	0	4	0.8	14.8%
	14:00	0	0	0	0	1	1	0	0	0	0	1	0.2	3.7%
	15:00	0	1	0	2	0	3	0	0	0	0	3	0.6	11.1%
	16:00	2	1	0	0	0	3	0	0	0	0	3	0.6	11.1%
	17:00	0	0	2	0	2	2	2	0	0	0	4	0.8	14.8%
	18:00	0	1	0	0	0	1	0	0	0	0	1	0.2	3.7%
	19:00	1	0	0	1	0	2	0	0	0	0	2	0.4	7.4%
	20:00	0	0	0	1	0	0	1	0	0	0	1	0.2	3.7%
	21:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	22:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	23:00	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
Time Period	12AM-6AM	0	0	0	1	0	0	0	0	1	0	1	0.2	3.7%
	6AM-12PM	3	1	2	0	0	4	1	0	0	1	6	1.2	22.2%
	12PM-6PM	2	3	3	3	5	12	4	0	0	0	16	3.2	59.3%
	6PM-12AM	1	1	0	2	0	3	1	0	0	0	4	0.8	14.8%
Alcohol & Drugs	None	6	5	5	6	5	19	6	0	1	1	27	5.4	100.0%
	Alcohol Involved	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Drugs Involved	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Alcohol and Drugs	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
	Undetermined	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%
Age of Driver 1 (Typically Driver at Fault)	19 and Under	0	0	0	0	0						0	0.0	0.0%
	20-24	0	0	0	0	0						0	0.0	0.0%
	25-29	0	0	0	0	0						0	0.0	0.0%
	30-34	0	0	0	0	0						0	0.0	0.0%
	35-39	0	0	0	0	0						0	0.0	0.0%
	40-44	0	0	0	0	0						0	0.0	0.0%
	45-49	0	0	0	0	0						0	0.0	0.0%
	50-54	0	0	0	0	0						0	0.0	0.0%
	55-59	0	0	0	0	0						0	0.0	0.0%
	60-64	0	0	0	0	0						0	0.0	0.0%
	65-69	0	0	0	0	0						0	0.0	0.0%
	70-74	0	0	0	0	0						0	0.0	0.0%
	75-79	0	0	0	0	0						0	0.0	0.0%
	80-84	0	0	0	0	0						0	0.0	0.0%
	85 and Over	0	0	0	0	0						0	0.0	0.0%
	Unknown	0	0	0	0	0						0	0.0	0.0%

CRASH ANALYSIS - N MIAMI AVENUE & N 163 STREET







CAP-X – 2021 AM Peak

Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	MD TPO Intersection Safety Analysis
Project Number:	22756.32
Location:	N Miami Ave & N 163 St
Date:	2021 AM
Number of Intersection Legs:	4
Major Street Direction	North-South

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	8	54	0	1.79%	0.00%
Westbound	0	13	24	15	0.00%	0.00%
Southbound	0	9	146	6	2.45%	0.00%
Northbound	0	4	226	8	2.95%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	0.80	0.95		0.85		
Truck to PCE Factor				Suggested = 2.00		2.00
FDOT Context Zone		C4-General Urban Residential				
Critical Lane Volume Threshold		2-phase signal		Suggested = 1800		1800
		3-phase signal		Suggested = 1750		1750
		4-phase signal		Suggested = 1700		1700

Capacity Analysis for Planning of Junctions

Summary Report - Page 2 of 2





TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
Traffic Signal	0.10	1	2.4	Poor	Poor	Fair
Two-Way Stop Control N-S	0.14	2	1.9	Poor	Poor	Fair
1 X 1	0.19	3	3.3	Fair	Fair	Fair
75 ICD	0.25	4	3.3	Fair	Fair	Fair
50 ICD	0.26	5	3.3	Fair	Fair	Fair
All-Way Stop Control	0.44	6	3.3	Fair	Fair	Fair
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CAP-X – 2021 PM Peak

Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	MD TPO Intersection Safety Analysis
Project Number:	22756.32
Location:	N Miami Ave & N 163 St
Date:	2021 PM
Number of Intersection Legs:	4
Major Street Direction	North-South

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	24	40	5	2.92%	0.00%
Westbound	0	16	37	48	0.99%	0.00%
Southbound	0	13	171	2	2.67%	0.00%
Northbound	0	9	402	7	1.93%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	0.80	0.95		0.85		
Truck to PCE Factor				Suggested = 2.00		2.00
FDOT Context Zone		C4-General Urban Residential				
Critical Lane Volume Threshold		2-phase signal		Suggested = 1800		1800
		3-phase signal		Suggested = 1750		1750
		4-phase signal		Suggested = 1700		1700

Capacity Analysis for Planning of Junctions

Summary Report - Page 2 of 2

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
Traffic Signal	0.17	1	2.4	Poor	Poor	Fair
Two-Way Stop Control N-S	0.25	2	1.9	Poor	Poor	Fair
1 X 1	0.34	3	3.3	Fair	Fair	Fair
75 ICD	0.45	4	3.3	Fair	Fair	Fair
50 ICD	0.45	5	3.3	Fair	Fair	Fair
All-Way Stop Control	0.66	6	3.3	Fair	Fair	Fair
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SPICE – Stage 1

Federal Highway Administration (FHWA)							
Safety Performance for Intersection Control Evaluation Tool							
Results							
Summary of crash prediction results for each alternative							
Project Information							
Project Name:	MD TPO Intersection Safety Analysis			Intersection Type		At-Grade Intersections	
Intersection:	N Miami Ave & N 163 St			Opening Year		2025	
Agency:	Miami Dade TPO			Design Year		2045	
Project Reference:	22756.32			Facility Type		On Urban and Suburban Arterial	
City:	Miami			Number of Legs		4-leg	
State:	Florida			1-Way/2-Way		2-way Intersecting 2-way	
Date:	4/11/2021			# of Major Street Lanes (both directions)		5 or fewer	
Analyst:	RMM			Major Street Approach Speed		Less than 55 mph	
Crash Prediction Summary							
Control Strategy	Crash Type	Opening Year	Design Year	Total Project Life Cycle	Rank	AADT Within Prediction Range?	Source of Prediction
Traffic Signal	Total	2.86	3.53	66.99	3	Yes	Calibrated SPF
	Fatal & Injury	0.91	1.14	21.49			
Minor Road Stop	Total	2.63	3.10	60.12	4	Yes	Calibrated SPF
	Fatal & Injury	0.98	1.18	22.64			
All Way Stop	Total	1.04	1.25	24.04	2	N/A	N/A
	Fatal & Injury	0.33	0.40	7.71			
1-lane Roundabout	Total	1.27	1.43	28.35	1	Yes	Uncalibrated SPF
	Fatal & Injury	0.21	0.25	4.85			

ICE FORM – Stage 1

Florida Department of Transportation

Intersection Control Evaluation (ICE) Form

Stage 1: Screening

Intersection Control Evaluation Form 750-010-003

To fulfill the requirements of Stage 1 (Screening) of FDOT's ICE procedures, complete the following form and append all supporting documentation. Completed forms can be submitted to the District Traffic Operations Engineer (DTOE) and District Design Engineer (DDE) for the project's approval.

Project Name	Miami-Dade TPO Intersection Safety Analysis		FDOT Project #		
Submitted By	Benazir Portal	Agency/Company	Kittelson & Associates, Inc.	Date	4/15/2021
Email	bportal@kittelson.com	FDOT District	District 6	County	Miami-Dade
Project Locality (City/Town/Village)	Miami, FL		Project Type	Safety Improvement Project	
Project Funding Source	Federal	FDOT Context Classification	C4 - Urban General		
Project Purpose (What is the catalyst for this project and why is it being undertaken?)	The Purpose & Need (P&N) for the project is to improve safety due to a pattern of angle and left turn crashes at the intersection of N Miami Avenue & N 163 Street. One angle crash resulted in a fatality and all injury related crashes were angle crashes during the study period. The study is to evaluate the intersection and provide justification to apply for HSIP Funds. An Intersection Control Evaluation (ICE) was conducted to determine the appropriate control type for the intersection.				
Project Setting Description (Describe the area surrounding the intersection)	The existing intersection control type is two-way stop control with the north/south approaches operating free flow. North Miami Avenue, located in Miami-Dade County, is a north-south roadway that functions as a local connector between N Biscayne River Drive and N 167 Street. N 163 Street is a local roadway that connects NW 2 Avenue to NE 6 Avenue. The intersection is surrounded by residential properties.				
Multimodal Context (Describe the pedestrian, bicycle, and transit activity in the area and the potential for activity based on surrounding land uses and development patterns)	There was little pedestrian or bicycle activity observed in this area. There are sidewalks present on the east side of the north leg and the north side of the east leg. N Miami Avenue is marked with sharrows in the northbound and southbound directions. There are no marked crosswalks at the intersection. Miami Dade Transit, Route 2, provides service along N Miami Avenue. Under the proposed mini-roundabout condition bicyclists will travel through the intersection on the roadway with vehicular traffic. The existing sharrow pavement markings are anticipated to remain.				

Major Street Information									
Route #:		Route Name(s)		N Miami Avenue		Milepost			
Existing Control Type		Two-way Stop-Control		Existing AADT		6,800		Design Year AADT	
Design Vehicle		34' Fire Pumper Tanker		Control Vehicle		34' Fire Pumper Tanker			
Primary Functional Classification				Urban Minor Arterial		Design Speed (mph)		30	
Secondary Functional Classification (if app.)						Target Speed (mph) [if app.]			
Approach #1	Direction	Northbound		Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes	
	Sidewalks along	Neither side of the approach		Left-Turn		0			
	Crosswalk on Approach?	No		Left-Through		0		Weekday AM Peak	
	On-Street Bike Facilities?	No		Through		0		Left	
	Multi-Use Path?	No		Left-Through-Right		1		Through	
	Scheduled Bus Service?	Yes		Through-Right		0		Right	
	Bus Stop on Approach?	No		Right-Turn		0		Daily Truck %	
Approach #2	Direction	Southbound		Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes	
	Sidewalks along:	One side of the approach		Left-Turn		0			
	Crosswalk on Approach?	No		Left-Through		0		Weekday AM Peak	
	On-Street Bike Facilities?	No		Through		0		Left	
	Multi-Use Path?	No		Left-Through-Right		1		Through	
	Scheduled Bus Service?	Yes		Through-Right		0		Right	
	Bus Stop on Approach?	No		Right-Turn		0		Daily Truck %	

Minor Street Information											
Route #:		Route Name(s)		N 163 St			Milepost (if app.)				
Existing Control Type		Two-way Stop-Control		Existing AADT		1,600		Design Year AADT		2,000	
Design Vehicle		34' Fire Pumper Tanker		Control Vehicle		34' Fire Pumper Tanker					
Primary Functional Classification			Urban Local			Design Speed (mph)		30			
Secondary Functional Classification (if app.)						Target Speed (mph) [if app.]					
Approach #1	Direction		Eastbound		Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes		
	Sidewalks along:		Neither side of the approach		Left-Turn		0				
	Crosswalk on Approach?		No		Left-Through		0		Weekday AM Peak		
	On-Street Bike Facilities?		No		Through		0		Left		24
	Multi-Use Path?		No		Left-Through-Right		1		Through		40
	Scheduled Bus Service?		No		Through-Right		0		Right		5
	Bus Stop on Approach?		No		Right-Turn		0		Daily Truck %		2.4%
Approach #2	Direction		Westbound		Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes		
	Sidewalks along:		One side of the approach		Left-Turn		0				
	Crosswalk on Approach?		No		Left-Through		0		Weekday AM Peak		
	On-Street Bike Facilities?		No		Through		0		Left		16
	Multi-Use Path?		No		Left-Through-Right		1		Through		37
	Scheduled Bus Service?		No		Through-Right		0		Right		48
	Bus Stop on Approach?		No		Right-Turn		0		Daily Truck %		0.7%
Approach #3	Direction				Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes		
	Sidewalks along:				Left-Turn						
	Crosswalk on Approach?				Left-Through				Weekday AM Peak		
	On-Street Bike Facilities?				Through				Left		
	Multi-Use Path?				Left-Through-Right				Through		
	Scheduled Bus Service?				Through-Right				Right		
	Bus Stop on Approach?				Right-Turn				Daily Truck %		

Crash History (Existing Intersections Only)	
Append the most recent five-years of crash data for the intersection from the CAR System. If the crash data evidences any issues relating to safety performance, discuss briefly here:	
The most recent three years of verified SSOGIS crash data on record (2016-2018) was collected for the study intersection. In addition, the most recent five years of Signal Four Analytics (S4) crash data (2016-2020) was downloaded and included in the analysis to verify crash patterns remained consistent in the most recent years. Over the five year history, 27 total crashes occurred with one being fatal and seven resulting in at least one injury. Angle crashes were the most common crash type with 23 crashes (85 percent). The fatal crash was an angle crash and the seven injury crashes were angle crashes. Sixteen of the 27 crashes (59 percent) occurred from 12 PM-6 PM.	

Control Strategy Evaluation						
Provide a brief justification as to why each of the following control strategies should be advanced or not. Justification should consider potential environmental impacts.						
Control Strategy	CAP-X Outputs			SPICE Ranking	Strategy to Be Advanced?	Justification
	V/C Ratio		Multimodal Score			
	Weekday AM Peak	Weekday PM Peak				
Two-Way Stop-Controlled	0.14	0.25	1.9	4	No	No-Build alternative is not viable due to existing angle and left turn crash patterns.
All-Way Stop-Controlled	0.44	0.66	3.3	2	No	Lower number of predicted crashes, but higher V/C when compared to the existing TWSC.
Signalized Control	0.10	0.17	2.4	3	No	Higher number of predicted crashes compared to the roundabout alternatives and the intersection does not meet signal warrants.
Roundabout	0.19 (1x1) 0.25 (75' ICD) 0.26 (50' ICD)	0.34 (1x1) 0.45 (75' ICD) 0.45 (50' ICD)	3.3	1	Yes	Higher V/C compared to the existing TWSC, but lower number of predicted crashes than existing TWSC and AWSC. The 75' ICD will be moved forward.
Median U-Turn	-	-	-	-	No	The intersection does not meet signal warrants.
RCUT (Signalized)	-	-	-	-	No	The intersection does not meet signal warrants.
RCUT (Unsignalized)	-	-	-	-	No	Significant ROW and environmental impacts in the area surrounding the intersection.
Jughandle				-	No	The intersection does not meet signal warrants.
Displaced Left-Turn	-	-	-	-	No	The intersection does not meet signal warrants.
Continuous Green Tee	-	-	-	-	No	The intersection is a four-leg intersection.
Quadrant Roadway	-	-	-		No	The intersection does not meet signal warrants.
Partial MUT	-	-	-	-	No	The intersection does not meet signal warrants.
Other 2 (Type)	-	-	-	-	No	N/A

Resolution					
To be filled out by FDOT District Traffic Operations Engineer and District Design Engineer					
Project Determination		Identified Control Strategy Approved			
Comments					
DOT E Name		Signature		Date	
DDE Name		Signature		Date	

APPENDIX G. OPERATIONAL ANALYSIS REPORT OUTPUTS





Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	8	54	0	13	24	15	4	226	8	9	146	6
Future Vol, veh/h	8	54	0	13	24	15	4	226	8	9	146	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	14	0	0	0	0	0	0	3	0	0	3	0
Mvmt Flow	8	57	0	14	25	16	4	238	8	9	154	6
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	446	429	157	454	428	242	160	0	0	246	0	0
Stage 1	175	175	-	250	250	-	-	-	-	-	-	-
Stage 2	271	254	-	204	178	-	-	-	-	-	-	-
Critical Hdwy	7.24	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.24	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.24	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.626	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	503	521	894	520	522	802	1432	-	-	1332	-	-
Stage 1	800	758	-	759	704	-	-	-	-	-	-	-
Stage 2	709	701	-	803	756	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	471	516	894	473	517	802	1432	-	-	1332	-	-
Mov Cap-2 Maneuver	471	516	-	473	517	-	-	-	-	-	-	-
Stage 1	798	753	-	757	702	-	-	-	-	-	-	-
Stage 2	668	699	-	737	751	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	13.1		12.1		0.1		0.4					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1432	-	-	510	562	1332	-	-				
HCM Lane V/C Ratio	0.003	-	-	0.128	0.097	0.007	-	-				
HCM Control Delay (s)	7.5	0	-	13.1	12.1	7.7	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0	-	-				

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	24	40	5	16	37	48	9	402	7	13	171	2
Future Vol, veh/h	24	40	5	16	37	48	9	402	7	13	171	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	4	3	0	0	0	2	0	2	0	0	3	0
Mvmt Flow	25	42	5	17	39	50	9	419	7	14	178	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	692	651	179	672	649	423	180	0	0	426	0	0
Stage 1	207	207	-	441	441	-	-	-	-	-	-	-
Stage 2	485	444	-	231	208	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.53	6.2	7.1	6.5	6.22	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.14	5.53	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.53	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.027	3.3	3.5	4	3.318	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	356	386	869	372	391	631	1408	-	-	1144	-	-
Stage 1	790	729	-	599	580	-	-	-	-	-	-	-
Stage 2	560	573	-	776	734	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	298	378	869	333	382	631	1408	-	-	1144	-	-
Mov Cap-2 Maneuver	298	378	-	333	382	-	-	-	-	-	-	-
Stage 1	784	719	-	594	575	-	-	-	-	-	-	-
Stage 2	477	568	-	716	724	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.5		15.2		0.2		0.6	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1408	-	-	359	457	1144	-
HCM Lane V/C Ratio	0.007	-	-	0.2	0.23	0.012	-
HCM Control Delay (s)	7.6	0	-	17.5	15.2	8.2	0
HCM Lane LOS	A	A	-	C	C	A	A
HCM 95th %tile Q(veh)	0	-	-	0.7	0.9	0	-

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	56	0	14	25	16	4	235	8	9	152	6
Future Vol, veh/h	8	56	0	14	25	16	4	235	8	9	152	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	14	0	0	0	0	0	0	3	0	0	3	0
Mvmt Flow	8	59	0	15	26	17	4	247	8	9	160	6
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	462	444	163	470	443	251	166	0	0	255	0	0
Stage 1	181	181	-	259	259	-	-	-	-	-	-	-
Stage 2	281	263	-	211	184	-	-	-	-	-	-	-
Critical Hdwy	7.24	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.24	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.24	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.626	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	490	511	887	507	512	793	1424	-	-	1322	-	-
Stage 1	794	754	-	750	697	-	-	-	-	-	-	-
Stage 2	700	694	-	796	751	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	457	505	887	458	506	793	1424	-	-	1322	-	-
Mov Cap-2 Maneuver	457	505	-	458	506	-	-	-	-	-	-	-
Stage 1	792	748	-	748	695	-	-	-	-	-	-	-
Stage 2	657	692	-	727	745	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	13.4		12.3		0.1		0.4					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1424	-	-	498	549	1322	-	-				
HCM Lane V/C Ratio	0.003	-	-	0.135	0.105	0.007	-	-				
HCM Control Delay (s)	7.5	0	-	13.4	12.3	7.7	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.5	0.4	0	-	-				

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	42	5	17	38	50	9	418	7	14	178	2
Future Vol, veh/h	25	42	5	17	38	50	9	418	7	14	178	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	4	3	0	0	0	2	0	2	0	0	3	0
Mvmt Flow	26	44	5	18	40	52	9	435	7	15	185	2
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	719	676	186	698	674	439	187	0	0	442	0	0
Stage 1	216	216	-	457	457	-	-	-	-	-	-	-
Stage 2	503	460	-	241	217	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.53	6.2	7.1	6.5	6.22	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.14	5.53	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.53	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.027	3.3	3.5	4	3.318	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	341	374	861	358	379	618	1399	-	-	1129	-	-
Stage 1	782	722	-	587	571	-	-	-	-	-	-	-
Stage 2	547	564	-	767	727	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	282	365	861	318	370	618	1399	-	-	1129	-	-
Mov Cap-2 Maneuver	282	365	-	318	370	-	-	-	-	-	-	-
Stage 1	775	711	-	582	566	-	-	-	-	-	-	-
Stage 2	462	559	-	705	716	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	18.4		15.8		0.2		0.6					
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1399	-	-	344	443	1129	-	-				
HCM Lane V/C Ratio	0.007	-	-	0.218	0.247	0.013	-	-				
HCM Control Delay (s)	7.6	0	-	18.4	15.8	8.2	0	-				
HCM Lane LOS	A	A	-	C	C	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.8	1	0	-	-				

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	10	67	0	16	30	19	5	280	10	11	181	7
Future Vol, veh/h	10	67	0	16	30	19	5	280	10	11	181	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	14	0	0	0	0	0	0	3	0	0	3	0
Mvmt Flow	11	71	0	17	32	20	5	295	11	12	191	7
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	556	535	195	565	533	301	198	0	0	306	0	0
Stage 1	219	219	-	311	311	-	-	-	-	-	-	-
Stage 2	337	316	-	254	222	-	-	-	-	-	-	-
Critical Hdwy	7.24	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.24	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.24	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.626	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	424	454	851	439	456	743	1387	-	-	1266	-	-
Stage 1	757	726	-	704	662	-	-	-	-	-	-	-
Stage 2	653	659	-	755	723	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	386	447	851	381	449	743	1387	-	-	1266	-	-
Mov Cap-2 Maneuver	386	447	-	381	449	-	-	-	-	-	-	-
Stage 1	754	718	-	701	659	-	-	-	-	-	-	-
Stage 2	603	656	-	673	715	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	15.1		13.7		0.1		0.4					
HCM LOS	C		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1387	-	-	438	484	1266	-	-				
HCM Lane V/C Ratio	0.004	-	-	0.185	0.141	0.009	-	-				
HCM Control Delay (s)	7.6	0	-	15.1	13.7	7.9	0	-				
HCM Lane LOS	A	A	-	C	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.7	0.5	0	-	-				

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	50	6	20	46	60	11	498	9	16	212	2
Future Vol, veh/h	30	50	6	20	46	60	11	498	9	16	212	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	4	3	0	0	0	2	0	2	0	0	3	0
Mvmt Flow	31	52	6	21	48	63	11	519	9	17	221	2
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	857	806	222	831	803	524	223	0	0	528	0	0
Stage 1	256	256	-	546	546	-	-	-	-	-	-	-
Stage 2	601	550	-	285	257	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.53	6.2	7.1	6.5	6.22	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.14	5.53	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.53	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.027	3.3	3.5	4	3.318	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	275	314	823	291	319	553	1358	-	-	1049	-	-
Stage 1	744	694	-	526	521	-	-	-	-	-	-	-
Stage 2	484	514	-	727	699	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	210	305	823	245	309	553	1358	-	-	1049	-	-
Mov Cap-2 Maneuver	210	305	-	245	309	-	-	-	-	-	-	-
Stage 1	736	681	-	520	515	-	-	-	-	-	-	-
Stage 2	385	508	-	654	686	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	24.4		19.9		0.2		0.6					
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1358	-	-	274	372	1049	-	-				
HCM Lane V/C Ratio	0.008	-	-	0.327	0.353	0.016	-	-				
HCM Control Delay (s)	7.7	0	-	24.4	19.9	8.5	0	-				
HCM Lane LOS	A	A	-	C	C	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	1.4	1.6	0	-	-				

MOVEMENT SUMMARY

 Site: 101 [N Miami Ave & N 163 St_Existing AM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: N Miami Ave												
3	L2	4	0.0	0.246	5.8	LOS A	1.0	26.4	0.22	0.11	0.22	32.8
8	T1	238	3.0	0.246	5.9	LOS A	1.0	26.4	0.22	0.11	0.22	32.9
18	R2	8	0.0	0.246	5.8	LOS A	1.0	26.4	0.22	0.11	0.22	32.4
Approach		251	2.8	0.246	5.9	LOS A	1.0	26.4	0.22	0.11	0.22	32.9
East: N 163 St												
1	L2	14	0.0	0.063	4.7	LOS A	0.2	5.5	0.35	0.24	0.35	33.0
6	T1	25	0.0	0.063	4.7	LOS A	0.2	5.5	0.35	0.24	0.35	33.2
16	R2	16	0.0	0.063	4.7	LOS A	0.2	5.5	0.35	0.24	0.35	32.6
Approach		55	0.0	0.063	4.7	LOS A	0.2	5.5	0.35	0.24	0.35	33.0
North: N Miami Ave												
7	L2	9	0.0	0.161	4.8	LOS A	0.6	15.8	0.14	0.06	0.14	33.2
4	T1	154	3.0	0.161	4.9	LOS A	0.6	15.8	0.14	0.06	0.14	33.3
14	R2	6	0.0	0.161	4.8	LOS A	0.6	15.8	0.14	0.06	0.14	32.9
Approach		169	2.7	0.161	4.9	LOS A	0.6	15.8	0.14	0.06	0.14	33.3
West: N 163 St												
5	L2	8	14.0	0.072	5.0	LOS A	0.2	6.3	0.29	0.18	0.29	32.8
2	T1	57	0.0	0.072	4.5	LOS A	0.2	6.3	0.29	0.18	0.29	33.5
12	R2	1	0.0	0.072	4.5	LOS A	0.2	6.3	0.29	0.18	0.29	32.9
Approach		66	1.8	0.072	4.5	LOS A	0.2	6.3	0.29	0.18	0.29	33.4
All Vehicles		541	2.4	0.246	5.3	LOS A	1.0	26.4	0.22	0.12	0.22	33.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: H:\22\22756 - Miami-Dade TPO GPC\032 - Miami-Dade Intersection Safety Analysis\analysis\SIDRA\Traffic Circle Analysis.sip8

MOVEMENT SUMMARY

 **Site: 101 [N Miami Ave & N 163 St_Existing PM]**

Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: N Miami Ave												
3	L2	9	0.0	0.426	8.2	LOS A	2.3	57.9	0.29	0.16	0.29	31.7
8	T1	419	2.0	0.426	8.3	LOS A	2.3	57.9	0.29	0.16	0.29	31.8
18	R2	7	0.0	0.426	8.2	LOS A	2.3	57.9	0.29	0.16	0.29	31.4
Approach		435	1.9	0.426	8.3	LOS A	2.3	57.9	0.29	0.16	0.29	31.8
East: N 163 St												
1	L2	17	0.0	0.149	6.7	LOS A	0.5	13.3	0.49	0.45	0.49	32.1
6	T1	39	0.0	0.149	6.7	LOS A	0.5	13.3	0.49	0.45	0.49	32.3
16	R2	50	2.0	0.149	6.8	LOS A	0.5	13.3	0.49	0.45	0.49	31.8
Approach		105	1.0	0.149	6.7	LOS A	0.5	13.3	0.49	0.45	0.49	32.0
North: N Miami Ave												
7	L2	14	0.0	0.188	5.1	LOS A	0.7	18.9	0.19	0.09	0.19	33.0
4	T1	178	3.0	0.188	5.2	LOS A	0.7	18.9	0.19	0.09	0.19	33.1
14	R2	2	0.0	0.188	5.1	LOS A	0.7	18.9	0.19	0.09	0.19	32.7
Approach		194	2.8	0.188	5.2	LOS A	0.7	18.9	0.19	0.09	0.19	33.1
West: N 163 St												
5	L2	25	4.0	0.081	4.9	LOS A	0.3	7.2	0.32	0.21	0.32	32.6
2	T1	42	3.0	0.081	4.8	LOS A	0.3	7.2	0.32	0.21	0.32	32.9
12	R2	5	0.0	0.081	4.7	LOS A	0.3	7.2	0.32	0.21	0.32	32.4
Approach		72	3.1	0.081	4.8	LOS A	0.3	7.2	0.32	0.21	0.32	32.7
All Vehicles		806	2.1	0.426	7.0	LOS A	2.3	57.9	0.29	0.18	0.29	32.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 8.0 | Copyright © 2000-2019 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: KITTELSON AND ASSOCIATES INC | Processed: Monday, May 17, 2021 6:16:12 PM

Project: H:\22\22756 - Miami-Dade TPO GPC\032 - Miami-Dade Intersection Safety Analysis\analysis\SIDRA\Traffic Circle Analysis.sip8

MOVEMENT SUMMARY

 Site: 101 [N Miami Ave & N 163 St_2025 AM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: N Miami Ave												
3	L2	4	0.0	0.256	5.9	LOS A	1.1	27.7	0.22	0.11	0.22	32.7
8	T1	247	3.0	0.256	6.0	LOS A	1.1	27.7	0.22	0.11	0.22	32.8
18	R2	8	0.0	0.256	5.9	LOS A	1.1	27.7	0.22	0.11	0.22	32.4
Approach		260	2.9	0.256	6.0	LOS A	1.1	27.7	0.22	0.11	0.22	32.8
East: N 163 St												
1	L2	15	0.0	0.067	4.8	LOS A	0.2	5.8	0.36	0.25	0.36	32.9
6	T1	26	0.0	0.067	4.8	LOS A	0.2	5.8	0.36	0.25	0.36	33.1
16	R2	17	0.0	0.067	4.8	LOS A	0.2	5.8	0.36	0.25	0.36	32.6
Approach		58	0.0	0.067	4.8	LOS A	0.2	5.8	0.36	0.25	0.36	32.9
North: N Miami Ave												
7	L2	9	0.0	0.167	4.9	LOS A	0.6	16.5	0.15	0.06	0.15	33.2
4	T1	160	3.0	0.167	5.0	LOS A	0.6	16.5	0.15	0.06	0.15	33.3
14	R2	6	0.0	0.167	4.9	LOS A	0.6	16.5	0.15	0.06	0.15	32.8
Approach		176	2.7	0.167	4.9	LOS A	0.6	16.5	0.15	0.06	0.15	33.3
West: N 163 St												
5	L2	8	14.0	0.074	5.1	LOS A	0.3	6.6	0.30	0.19	0.30	32.7
2	T1	59	0.0	0.074	4.5	LOS A	0.3	6.6	0.30	0.19	0.30	33.5
12	R2	1	0.0	0.074	4.5	LOS A	0.3	6.6	0.30	0.19	0.30	32.9
Approach		68	1.7	0.074	4.6	LOS A	0.3	6.6	0.30	0.19	0.30	33.4
All Vehicles		562	2.4	0.256	5.4	LOS A	1.1	27.7	0.22	0.12	0.22	33.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 101 [N Miami Ave & N 163 St_2025 PM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: N Miami Ave												
3	L2	9	0.0	0.445	8.5	LOS A	2.4	61.9	0.31	0.17	0.31	31.5
8	T1	435	2.0	0.445	8.6	LOS A	2.4	61.9	0.31	0.17	0.31	31.7
18	R2	7	0.0	0.445	8.5	LOS A	2.4	61.9	0.31	0.17	0.31	31.2
Approach		452	1.9	0.445	8.6	LOS A	2.4	61.9	0.31	0.17	0.31	31.7
East: N 163 St												
1	L2	18	0.0	0.158	6.9	LOS A	0.6	14.2	0.50	0.47	0.50	32.0
6	T1	40	0.0	0.158	6.9	LOS A	0.6	14.2	0.50	0.47	0.50	32.2
16	R2	52	2.0	0.158	7.0	LOS A	0.6	14.2	0.50	0.47	0.50	31.7
Approach		109	1.0	0.158	7.0	LOS A	0.6	14.2	0.50	0.47	0.50	31.9
North: N Miami Ave												
7	L2	15	0.0	0.196	5.2	LOS A	0.8	20.0	0.19	0.09	0.19	33.0
4	T1	185	3.0	0.196	5.3	LOS A	0.8	20.0	0.19	0.09	0.19	33.1
14	R2	2	0.0	0.196	5.2	LOS A	0.8	20.0	0.19	0.09	0.19	32.6
Approach		202	2.8	0.196	5.3	LOS A	0.8	20.0	0.19	0.09	0.19	33.1
West: N 163 St												
5	L2	26	4.0	0.086	5.0	LOS A	0.3	7.6	0.33	0.22	0.33	32.6
2	T1	44	3.0	0.086	4.9	LOS A	0.3	7.6	0.33	0.22	0.33	32.8
12	R2	5	0.0	0.086	4.8	LOS A	0.3	7.6	0.33	0.22	0.33	32.4
Approach		75	3.1	0.086	4.9	LOS A	0.3	7.6	0.33	0.22	0.33	32.7
All Vehicles		839	2.1	0.445	7.3	LOS A	2.4	61.9	0.31	0.20	0.31	32.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 101 [N Miami Ave & N 163 St_2045 AM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: N Miami Ave												
3	L2	5	0.0	0.311	6.7	LOS A	1.4	35.7	0.27	0.15	0.27	32.4
8	T1	295	3.0	0.311	6.8	LOS A	1.4	35.7	0.27	0.15	0.27	32.5
18	R2	11	0.0	0.311	6.7	LOS A	1.4	35.7	0.27	0.15	0.27	32.0
Approach		311	2.8	0.311	6.8	LOS A	1.4	35.7	0.27	0.15	0.27	32.5
East: N 163 St												
1	L2	17	0.0	0.083	5.2	LOS A	0.3	7.3	0.40	0.31	0.40	32.7
6	T1	32	0.0	0.083	5.2	LOS A	0.3	7.3	0.40	0.31	0.40	32.9
16	R2	20	0.0	0.083	5.2	LOS A	0.3	7.3	0.40	0.31	0.40	32.4
Approach		68	0.0	0.083	5.2	LOS A	0.3	7.3	0.40	0.31	0.40	32.7
North: N Miami Ave												
7	L2	12	0.0	0.201	5.2	LOS A	0.8	20.6	0.17	0.07	0.17	33.0
4	T1	191	3.0	0.201	5.3	LOS A	0.8	20.6	0.17	0.07	0.17	33.1
14	R2	7	0.0	0.201	5.2	LOS A	0.8	20.6	0.17	0.07	0.17	32.7
Approach		209	2.7	0.201	5.3	LOS A	0.8	20.6	0.17	0.07	0.17	33.1
West: N 163 St												
5	L2	11	14.0	0.093	5.4	LOS A	0.3	8.3	0.34	0.23	0.34	32.6
2	T1	71	0.0	0.093	4.9	LOS A	0.3	8.3	0.34	0.23	0.34	33.3
12	R2	1	0.0	0.093	4.9	LOS A	0.3	8.3	0.34	0.23	0.34	32.8
Approach		82	1.8	0.093	4.9	LOS A	0.3	8.3	0.34	0.23	0.34	33.2
All Vehicles		671	2.4	0.311	5.9	LOS A	1.4	35.7	0.26	0.15	0.26	32.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 101 [N Miami Ave & N 163 St_2045 PM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: N Miami Ave												
3	L2	11	0.0	0.539	10.4	LOS B	3.4	86.1	0.39	0.24	0.39	30.7
8	T1	519	2.0	0.539	10.4	LOS B	3.4	86.1	0.39	0.24	0.39	30.9
18	R2	9	0.0	0.539	10.4	LOS B	3.4	86.1	0.39	0.24	0.39	30.4
Approach		540	1.9	0.539	10.4	LOS B	3.4	86.1	0.39	0.24	0.39	30.9
East: N 163 St												
1	L2	21	0.0	0.208	8.2	LOS A	0.7	18.9	0.55	0.55	0.55	31.5
6	T1	48	0.0	0.208	8.2	LOS A	0.7	18.9	0.55	0.55	0.55	31.7
16	R2	63	2.0	0.208	8.3	LOS A	0.7	18.9	0.55	0.55	0.55	31.1
Approach		131	1.0	0.208	8.2	LOS A	0.7	18.9	0.55	0.55	0.55	31.4
North: N Miami Ave												
7	L2	17	0.0	0.236	5.7	LOS A	1.0	25.0	0.22	0.11	0.22	32.7
4	T1	221	3.0	0.236	5.8	LOS A	1.0	25.0	0.22	0.11	0.22	32.9
14	R2	2	0.0	0.236	5.7	LOS A	1.0	25.0	0.22	0.11	0.22	32.4
Approach		240	2.8	0.236	5.8	LOS A	1.0	25.0	0.22	0.11	0.22	32.8
West: N 163 St												
5	L2	31	4.0	0.107	5.4	LOS A	0.4	9.5	0.37	0.27	0.37	32.4
2	T1	52	3.0	0.107	5.3	LOS A	0.4	9.5	0.37	0.27	0.37	32.6
12	R2	6	0.0	0.107	5.2	LOS A	0.4	9.5	0.37	0.27	0.37	32.2
Approach		90	3.1	0.107	5.3	LOS A	0.4	9.5	0.37	0.27	0.37	32.5
All Vehicles		1000	2.1	0.539	8.6	LOS A	3.4	86.1	0.37	0.25	0.37	31.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

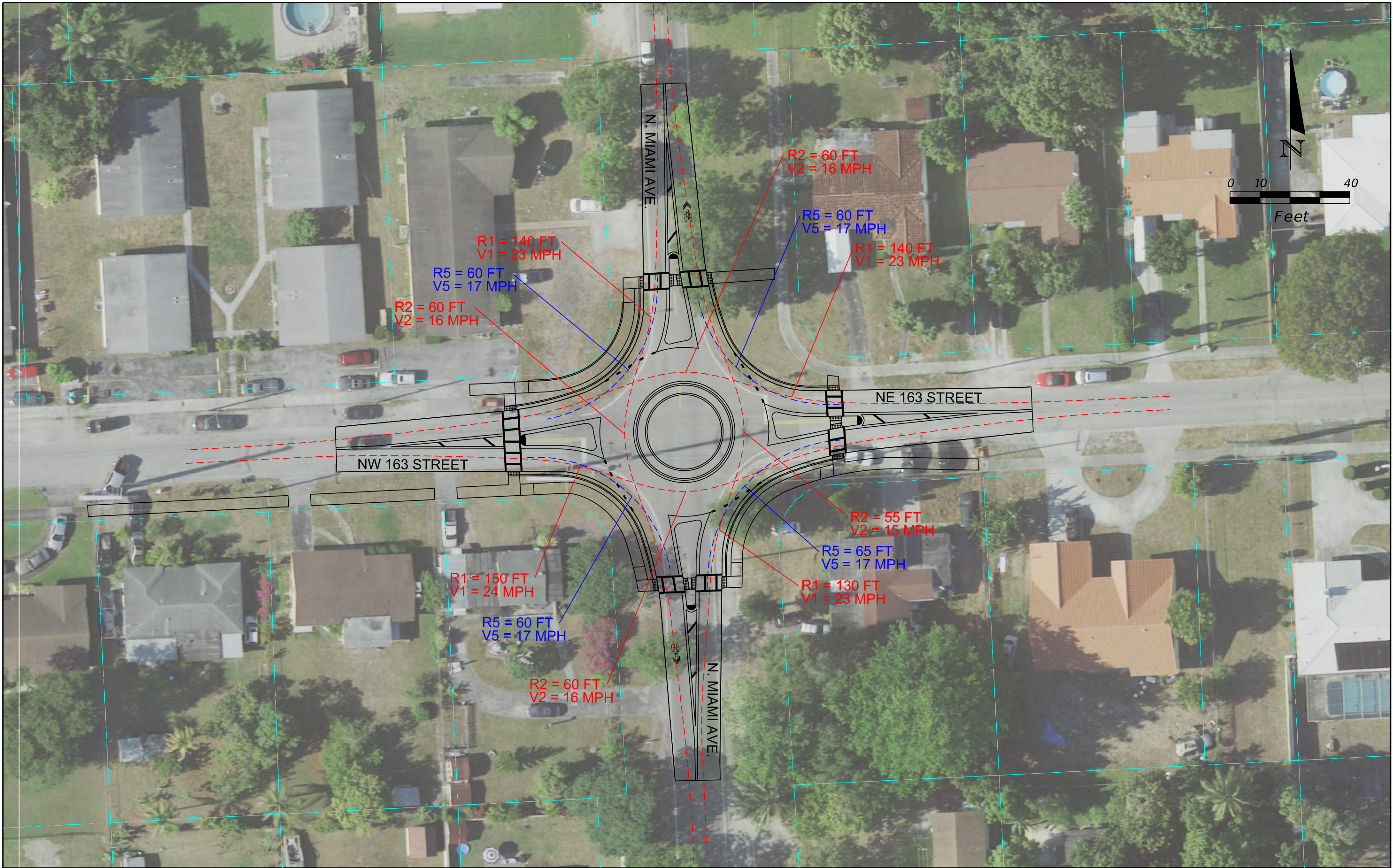
Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

APPENDIX H. DESIGN CHECKS



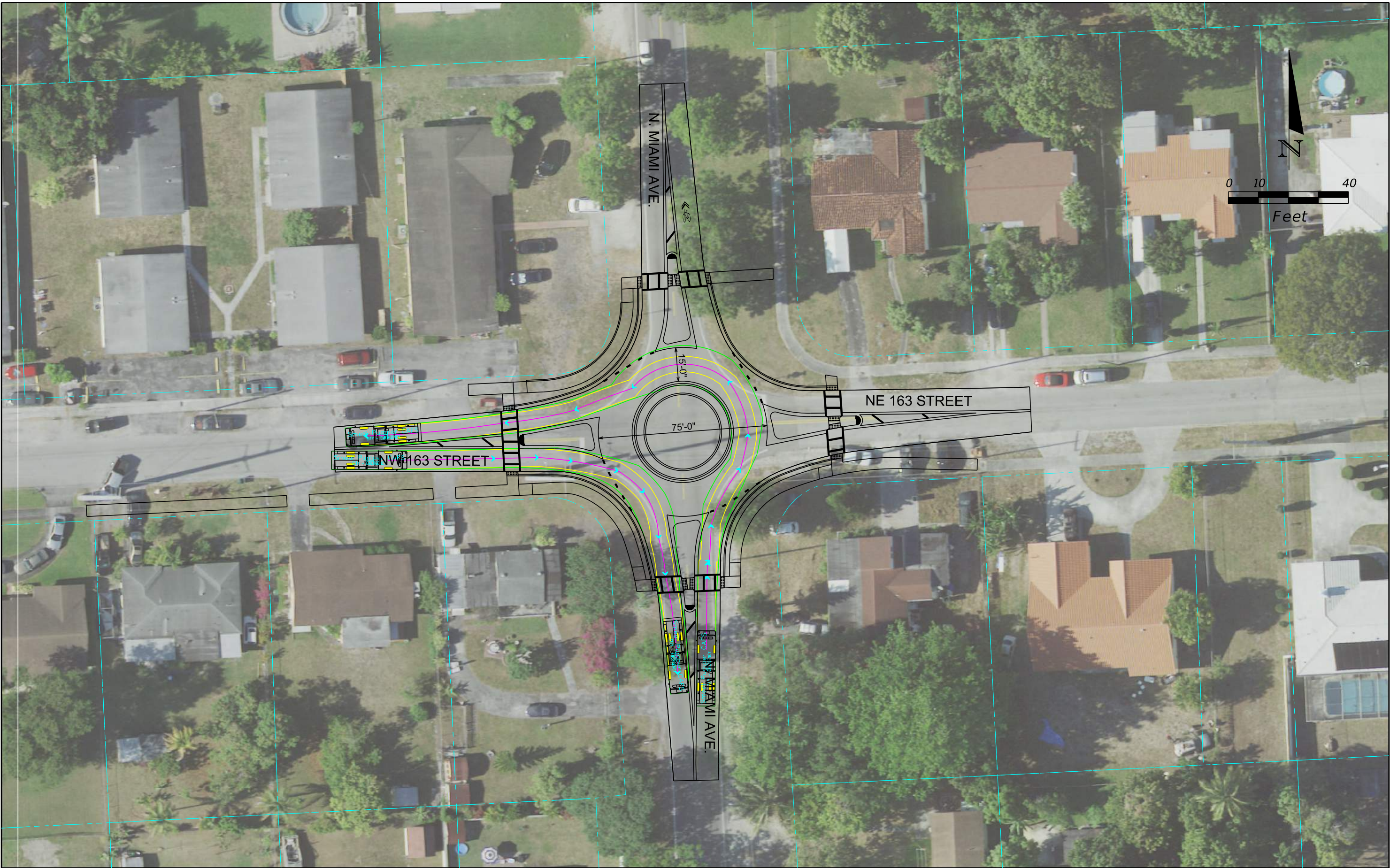
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION



MIAMI-DADE
TRANSPORTATION PLANNING ORGANIZATION

**N. MIAMI AVE. & NE 163 STREET
ROUNDAABOUT CONCEPT
FASTEST PATHS**

FIGURE
NO.



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION



MIAMI-DADE
TRANSPORTATION PLANNING ORGANIZATION

***N. MIAMI AVE. & NE 163 STREET
ROUNDAABOUT CONCEPT
TURNING MOVEMENTS
(33'-6" FIRE TANKER)***

FIGURE
NO.

APPENDIX I. OPINION OF PROBABLE COST

N Miami Avenue at NE 163 Street

Miami-Dade TPO

Conceptual Roundabout Design



Engineer's Opinion of Probable Cost - Conceptual Improvements

Prepared By: Brandon W. Kelley

Date: May 25, 2021

	PAY ITEM	DESCRIPTION	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
SECTION 1: ROADWAY						
1	0110 1 1	Clearing & Grubbing	AC	0.22	\$20,613.10	\$4,534.88
2	0120 1	Excavation	CY	280.00	\$15.21	\$4,258.80
3	0160 4	Type B Stabilization	SY	389.00	\$3.97	\$1,544.33
4	285709	Optional Base, Base Group 09	SY	315.00	\$23.68	\$7,459.20
5	0327 70 5	Milling Existing Asphalt Pavement, 2" Avg Depth	SY	1629.00	\$1.98	\$3,225.42
6	0334 1 52	Superpave Asphaltic Concrete, Traffic B, PG 76-22	TN	108.00	\$130.00	\$14,040.00
7	0337-7-80	Asph Conc FC, Traffic B, FC-9.5, PG 76-22	TN	108.00	\$219.69	\$23,726.52
8	350-30-13	Concrete Pavement for Roundabout Apron, 12" depth	SY	47.00	\$218.34	\$10,261.98
9	0520-1-10	Concrete Curb and Gutter, Type F	LF	326.00	\$17.49	\$5,701.74
10	0520-2-4	Concrete Curb, Type D	LF	109.00	\$35.42	\$3,860.78
11	0520-2-8	Concrete Curb and Gutter, Type RA	LF	142.00	\$22.53	\$3,199.26
12	520-70	Concrete Traffic Separator, Special, Variable Width	SY	112.00	\$177.30	\$19,857.60
13	0522-1	Concrete Sidewalk and Driveways, 4"	SY	228.00	\$32.84	\$7,487.52
14	0527 2	Detectable Warnings	SF	80.00	\$28.22	\$2,257.60
15	0570-1-2	Performance Turf, SOD	SY	321.00	\$3.72	\$1,194.12
SUBTOTAL ROADWAY						\$ 112,610
SECTION 2: STRIPING						
16	0710-11290	Painted Pavement Markings, Standard, Yellow, Island Nose	SF	24.00	\$2.95	\$70.80
17	0711-16-102	Thermoplastic, Standard - Other Surfaces, White, Solid, 6"	GM	0.21	\$3,995.30	\$839.01
18	0711-16-201	Thermoplastic, Standard - Other Surfaces, Yellow, Solid, 6"	GM	0.25	\$3,993.45	\$998.36
19	0711-11123	Thermoplastic, STD, White, Solid, 12" For Crosswalk and Roundabout	LF	193.00	\$1.62	\$312.66
20	0711-11125	Thermoplastic, STD, White, Solid, 24" For Stop Line and Crosswalk	LF	120.00	\$3.51	\$421.20
21	0711-11224	Thermoplastic, STD, Yellow, Solid, 18" For Diagonals or Crosswalk	LF	39.00	\$2.42	\$94.38
22	0711 11144	Thermoplastic, Standard, White, 2-2 Dotted Extension Line, 12" for Roundabout	GM	0.03	\$4,150.00	\$124.50
23	0711-14160	Thermoplastic, Preformed, White, Message	EA	2.00	\$280.89	\$561.78
SUBTOTAL STRIPING						\$ 3,423
SECTION 3: SIGNING						
24	0700 1 11	Single Post Sign, F&I Ground Mount, Up to 12 SF	EA	20.00	\$299.42	\$5,988.40
25	0700 1 60	Single Post Sign, Remove	EA	6.00	\$18.93	\$113.58
SUBTOTAL SIGNING						\$ 6,102
SECTION 4: UTILITIES						
26		Utility Relocation, Wooden Pole	EA	1.00	\$10,000.00	\$10,000.00
27	1080 24500	Utility Fixture, Valve Assembly, Adjust/Modify	EA	3.00	\$358.08	\$1,074.24
28		Telephone Pedestal, Relocate	EA	1.00	\$6,000.00	\$6,000.00
SUBTOTAL DRAINAGE						\$ 17,074
SECTION 5: ADDITIONAL MODIFICATIONS						
29		Sediment Barrier	LF	1015.00	\$1.18	\$1,197.70
SUBTOTAL ADDITIONAL MODIFICATIONS						\$ 1,198
SECTION 6: LIGHTING						
30		Intersection Lighting, 4 Light Pole Complete, F&I Standard Pole, 30' Mounting Height Including Connections/Wiring	LS	1.00	\$30,000.00	\$30,000.00
SUBTOTAL ADDITIONAL MODIFICATIONS						\$ 30,000
SUBTOTAL SECTIONS 1 -6						\$ 170,406
SECTION 7: MAINTENANCE OF TRAFFIC						
31		Subtotal Sections 1-6	LS	15.00%	\$25,560.96	\$25,560.96
SECTION 8: MOBILIZATION						
32		Subtotal Sections 1-6	LS	20.00%	\$34,081.27	\$34,081.27
ESTIMATED CONSTRUCTION COSTS						\$ 230,049
30% CONTINGENCY						\$ 69,020
TOTAL ESTIMATED CONSTRUCTION COSTS						\$ 299,069
CAPITAL SUPPORT COSTS						
33		Project Engineering	LS	25%	\$ 299,069	\$74,770.00
34		Construction Support / Construction Management	LS	15%	\$ 299,069	\$44,870.00
33		Post Design	LS	8%	\$ 299,069	\$23,930.00
TOTAL ESTIMATE CAPITAL SUPPORT COSTS						\$ 143,570
TOTAL PROJECT COST						\$ 442,639

APPENDIX J. BENEFIT/COST ANALYSIS

Outputs

This sheet compiles the data from summary tables in individual alternatives sheets. To populate the output sheet press the "Setup Worksheets" button in the

Agency:	MD TPO
Project Name:	MD TPO Intersection Safety Analysis
Project Reference:	22756.32
Intersection:	N Miami Avenue and N 163 Street
City:	Miami
State:	Florida
Performing Department or Organization:	KAI
Date:	4/22/2021
Analyst:	RMM
Analysis Type	At-Grade Intersection

Analysis Summary

Cost Categories	Net Present Value of Costs		
	Two-Way Stop Control	Roundabout	
Planning, Construction & Right of Way Costs	\$ -	\$ 442,639	
Post-Opening Costs	\$ 14,590	\$ 72,952	
Auto Passenger Delay	\$ 2,542,835	\$ 1,659,305	
Truck Delay	\$ 150,434	\$ 98,164	
Safety	\$ 5,800,480	\$ 1,160,462	
Total cost	\$8,508,339	\$3,433,522	Net Present Value of Benefits Relative to Base Case

Select Base Case for Benefit-Cost Comparison: (Choose from list)	Two-Way Stop Control		
Benefit Categories	Net Present Value of Benefits Relative to Base Case		
	Two-Way Stop Control	Roundabout	
Auto Passenger Delay		\$ 883,530	
Truck Delay		\$ 52,269	
Safety		\$ 4,640,018	
Net Present Value of Benefits		\$ 5,575,817	
Net Present Value of Costs		\$ 501,000	
Net Present Value of Improvement		\$ 5,074,817	
Benefit-Cost (B/C) Ratio		11.13	
Delay B/C		1.87	
Safety B/C		9.26	

APPENDIX K. FDOT ELECTRONIC REVIEW COMMENTS (ERC)

Submittal Report

Financial Project:	249796-8-32-01	Submittal Type:	SAFETY REPORT
Submittal Phase:	OTHER	Submittal Staff Type:	CONSULTANT
Received Date:	5/7/2021	Response Due Date:	5/24/2021
Grace Period:	0	District:	SIXTH
Status:	OPEN	Create Date:	5/7/2021
Create User Id:	RD652NP	Last Update:	5/7/2021
		Last Update User Id:	RD652NP

Description:

249796-8: TWO 32_N Miami Avenue and N 163 Street Intersection Safety Analysis_20210506
 Group: PRELIMINARY ENGINEERING Phase Review Type: Safety Study
 Status: Submitted
 Phase Initiation Date: 5/7/2021
 Comments Due Date: 5/21/2021 Days Allowed for Review: 15
 Review Meeting: 5/24/2021 8:00 PM to 8:15 PM @ No meeting required
 Field Meeting:
 Plans Format: Electronic
 Comments: Please have Benazir Portal as the PM for responses. bportal@kittelson.com
 Direct: 954.653.5634
 Please add Ryan Mansfield as a Designer to respond to comments.
 rmansfield@kittelson.com
 Direct: 407.373.1136

Threads:

Name	Assignment	Due Date	Status	Comments
Alejandro Almaguer	REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Alejandro Casals	LEAD REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Alejandro Gomez	LEAD REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Amanda De Cun	REVIEWER	5/21/2021	ACTIVE	4

No	Status	Current Holder	Reference	Categories
6	COMMENT AGREED WITH		General	ENVIRONMENTAL MANAGEMENT OFF.
Created By	Created On	Version	Delegate For	
Amanda De Cun	5/20/2021	1		
The class of action will be determined once the full scope of work and funding information is available.				
Benazir Portal	5/24/2021	1		
Noted. No action needed in response to the comment at this study stage. Thank you.				

No	Status	Current Holder	Reference	Categories
7	COMMENT AGREED WITH		General	ENVIRONMENTAL MANAGEMENT OFF.
Created By	Created On	Version	Delegate For	
Amanda De Cun	5/20/2021	1		
Please be aware that this project location is within the consultation area for the Florida bonneted bat, which is listed as an endangered species. A field review may be warranted to determine if roosting and/or foraging habitat exists within the project corridor for any tree and/or bridge impacts, and coordination with the U.S. Fish and Wildlife Service may be required.				
Benazir Portal	5/24/2021	1		
Noted. This comment will be addressed under the final design stage. Thank you.				

No	Status	Current Holder	Reference	Categories
8	COMMENT AGREED WITH		General	ENVIRONMENTAL MANAGEMENT OFF.
	Created By	Created On	Version	Delegate For
	Amanda De Cun	5/20/2021	1	
	Please be aware that this project is within the consultation area for the Everglade snail kite the Wood stork and may inhabit or migrate through the project area.			
	Benazir Portal	5/24/2021	1	
	Noted. This comment will be addressed under the final design stage. Thank you.			

No	Status	Current Holder	Reference	Categories
9	COMMENT AGREED WITH		Contact Information	ENVIRONMENTAL MANAGEMENT OFF.
	Created By	Created On	Version	Delegate For
	Amanda De Cun	5/20/2021	1	
	Should you have any questions or require clarification regarding these environmental comments, please contact Amanda De Cun at (305) 640-7460 or Amanda.DeCun@dot.state.fl.us.			
	Benazir Portal	5/24/2021	1	
	No action needed in response to the comment. Thank you.			

Name	Assignment	Due Date	Status	Comments
Amanda Montgomery	REVIEWER	5/21/2021	ACTIVE	2

No	Status	Current Holder	Reference	Categories
11	COMMENT AGREED WITH			ENVIRONMENTAL PERMITS
	Created By	Created On	Version	Delegate For
	Amanda Montgomery	5/21/2021	1	
	No local, state, or federal environmental permits are anticipated based on a review of the recommended scope of work.			
	Benazir Portal	5/24/2021	1	
	Noted. No action needed in response to the comment. Thank you.			

No	Status	Current Holder	Reference	Categories
12	COMMENT AGREED WITH			ENVIRONMENTAL PERMITS
	Created By	Created On	Version	Delegate For
	Amanda Montgomery	5/21/2021	1	
	Please contact me at Amanda.Montgomery@dot.state.fl.us with any questions pertaining to environmental permits for this project.			
	Benazir Portal	5/24/2021	1	
	No action needed in response to the comment. Thank you.			

Name	Assignment	Due Date	Status	Comments
Antonette Adams	LEAD REVIEWER	5/21/2021	ACTIVE	0

Name	Assignment	Due Date	Status	Comments
Arturo Gomez	REVIEWER	5/21/2021	ACTIVE	0

Name	Assignment	Due Date	Status	Comments
Barbara J Culhane	LEAD REVIEWER	5/21/2021	ACTIVE	0

Name	Assignment	Due Date	Status	Comments
Barbara Russell	REVIEWER	5/21/2021	ACTIVE	0

Name	Assignment	Due Date	Status	Comments
Benazir Portal	CONSULTANT PROJECT MANAGER	5/24/2021	ACTIVE	0

Name	Assignment	Due Date	Status	Comments
Bencze Vajta	REVIEWER	5/21/2021	ACTIVE	0

Name	Assignment	Due Date	Status	Comments
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Calvin Mason	LEAD REVIEWER	5/21/2021	ACTIVE	0*
Name	Assignment	Due Date	Status	Comments
Carl Sandin	REVIEWER	5/21/2021	ACTIVE	4
No	Status	Current Holder	Reference	Categories
19	COMMENT AGREED WITH		Sheet 8	BICYCLE/PEDESTRIAN
	Created By	Created On	Version	Delegate For
	Carl Sandin	5/21/2021	1	
	Figure 8. The proposed sidewalks should be extended to connect to the existing sidewalk and avoid creating a sidewalk gap. (a) Southwest corner, extend about 20 ft. west, (b) Southeast corner, extend about 35 ft. east.			
	Benazir Portal	5/24/2021	1	
	Noted. The sidewalks will be extended as noted.			
No	Status	Current Holder	Reference	Categories
22	COMMENT AGREED WITH		Sheet 8	OTHER
	Created By	Created On	Version	Delegate For
	Carl Sandin	5/21/2021	1	
	Verify the sheet scale on Figure 8. The 1"=40' scale shown does not appear correct.			
	Benazir Portal	5/24/2021	1	
	Noted. Sheet scale will be verified. Thank you.			
No	Status	Current Holder	Reference	Categories
23	RESPONSE SUBMITTED	Carl Sandin	Appendix H	ESTIMATES,PAVEMENT DESIGN
	Created By	Created On	Version	Delegate For
	Carl Sandin	5/21/2021	1	
	Appendix H, Cost Estimate. (a) Verify the pavement quantities for pay items 334-1-52 and 337-7-80. Based on the values for pay items 285-709 and 327-70-5, the quantities for 334-1-52 and 337-7-80 are underestimated. (b) The estimate assumes milling & resurfacing and widening the existing pavement. Confirm if full pavement reconstruction is required to construct the roundabout.			
	Benazir Portal	6/23/2021	1	
	Pavement design already accounted for full depth outside of existing pavement limits.			
No	Status	Current Holder	Reference	Categories
24	RESPONSE SUBMITTED	Carl Sandin	Appendix H	DRAINAGE,ESTIMATES
	Created By	Created On	Version	Delegate For
	Carl Sandin	5/21/2021	1	
	Appendix H, Cost Estimate. Add costs for drainage structures, since the project adds curb & gutter at the roundabout.			
	Benazir Portal	6/23/2021	1	
	Underground drainage structures are not proposed as part of this project. No survey was procured during this phase of design so existing systems are also unknown. It is anticipated drainage will flow from curbs into existing grass areas. Further drainage analysis will be completed during final design and after survey attainment.			
Name	Assignment	Due Date	Status	Comments
Carlos Benitez	REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Carlos Perez	REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Carlos Perez	REVIEWER	5/21/2021	ACTIVE	0*
Name	Assignment	Due Date	Status	Comments
Christopher Tavella	REVIEWER	5/21/2021	ACTIVE	0*
Name	Assignment	Due Date	Status	Comments

Diana Peralta	REVIEWER	5/21/2021	ACTIVE	0*
Name	Assignment	Due Date	Status	Comments
Dima Poe	REVIEWER	5/21/2021	ACTIVE	8
No	Status	Current Holder	Reference	Categories
20	COMMENT AGREED WITH		General	ACCESS MANAGEMENT,SAFETY,OTHER
Created By	Created On	Version	Delegate For	
Dima Poe	5/21/2021	1		
	General: Were other short term recommendations considered such as providing supplementary stop signs (as to have two stop signs) for the EB/WB approaches? There maybe a sight obstruction of the stop sign on the eastbound approach from the power pole on the south side of N 163 Street. Were sight triangles checked in the field? Also, please consider conducting a speed study to determine if there are speeding issues in the vicinity of the intersection.			
Benazir Portal	6/23/2021	1		
	Phased / short-term improvements will be considered as the FY funding availability is determined. The comment notes will be included for consideration.			
Benazir Portal	6/23/2021	1		
	Phased / short-term improvements will be considered as the FY funding availability is determined. The comment notes will be included for consideration.			
No	Status	Current Holder	Reference	Categories
21	RESPONSE SUBMITTED	Dima Poe	Page 14	ACCESS MANAGEMENT,SAFETY,OTHER
Created By	Created On	Version	Delegate For	
Dima Poe	5/21/2021	1		
	Page 14 - ICE Results: Please explain why AWSC was not moved forward as well for operational analysis. AWSC had a lower than existing condition predicted crash values and a safety ranking of 2, it does have a higher v/c ratio however that is expected since north/south movements are going from free to a stop control. Please consider also forwarding AWSC in addition to the mini-roundabout option for an operational and benefit/cost analysis within the study.			
Benazir Portal	6/23/2021	1		
	While AWSC does report better intersection performance for the project's purpose and need (safety ranking) under Stage 1, the control strategy does not mitigate the intersection leading crash type of angle crashes. For comparison, the N Miami Ave and N 195 Street operates under AWSC and yet reports angle crashes as the leading crash type. No action needed in response to the comment. Thank you.			
No	Status	Current Holder	Reference	Categories
25	RESPONSE SUBMITTED	Dima Poe	Page 18 - Concept	ACCESS MANAGEMENT,SAFETY,OTHER
Created By	Created On	Version	Delegate For	
Dima Poe	5/21/2021	1		
	Page 18 (Sheet 8) - Roundabout Concept: Please show existing condition elements within proposed conceptual design. There appears to be more elements that may need relocation in addition to the singular power pole. Note that the power pole to be relocated has a lighting attached, will relocating it require additional lighting to be installed at the intersection/crosswalks?			
Benazir Portal	6/23/2021	1		
	A photometric analysis will be needed as part of final design. It is anticipated the intersection will be lighted to meet recommended FDM and IES lighting level recommendations. The reuse of the existing fixture will be revisited during this analysis.			
No	Status	Current Holder	Reference	Categories
26	RESPONSE SUBMITTED	Dima Poe	Page 18 - Concept	ACCESS MANAGEMENT,SAFETY,OTHER
Created By	Created On	Version	Delegate For	
Dima Poe	5/21/2021	1		
	Page 18 (Sheet 8) - Concept: Are the proposed crosswalks warranted? Please make sure that all proposed sidewalks extend to connect to existing sidewalks along N 163 Street. Note that additional relocations may be necessary if the proposed sidewalks are constructed.			
Benazir Portal	6/23/2021	1		
	Given the proposed configuration (mini-roundabout) is common best practice to add marked crosswalks to better delineate expected path for all road users.			
	Per County requirements, new projects are required to provide a sidewalk connections. For blocks without the existing crosswalk connection, it is required to add one concrete slab at a minimum.			

No	Status	Current Holder	Reference	Categories
27	COMMENT AGREED WITH		Page 20	ACCESS MANAGEMENT,SAFETY,OTHER
	Created By	Created On	Version	Delegate For
	Dima Poe	5/21/2021	1	
	Page 20 Benefit/Cost: The overall B/C is very close to the threshold of 1.0.			
	Benazir Portal	5/24/2021	1	
	Noted. The Benefit-Cost evaluations have been updated to include the improvement's life cycle of 20 years yielding higher B/C rates and NPV. No action needed in response to the comment. Thank you.			

No	Status	Current Holder	Reference	Categories
28	COMMENT AGREED WITH		Appendix A, Genera	ACCESS MANAGEMENT,SAFETY,OTHER
	Created By	Created On	Version	Delegate For
	Dima Poe	5/21/2021	1	
	General, Appendix A - Please note that there are No Parking Signs on the NE, NW, SW corners which appear to be installed within late 2018 early 2019 (from Google Maps Historic Street View). There may have been an illegal parking issue on these corners that may have obstructed drivers view in the past and could have attributed to the crash patterns.			
	Benazir Portal	5/24/2021	1	
	Agreed. This was an element considered for the proposed design. No action needed in response to the comment. Thank you.			

No	Status	Current Holder	Reference	Categories
29	RESPONSE SUBMITTED	Dima Poe	Page 21	ACCESS MANAGEMENT,SAFETY,OTHER
	Created By	Created On	Version	Delegate For
	Dima Poe	5/21/2021	1	
	Page 21 - Coordination: Was there a meeting or discussion with Miami-Dade Transit regarding the proposed concept and impacts to the transit/bus route that traverses N Miami Avenue? If not they should be contacted to obtain their feedback.			
	Benazir Portal	6/23/2021	1	
	Noted. The design team worked with MDC to be able to accommodate transit vehicles through the proposed design. No action needed in response to the comment. Thank you.			

No	Status	Current Holder	Reference	Categories
30	RESPONSE SUBMITTED	Dima Poe	Operational Analysis	SAFETY,OTHER
	Created By	Created On	Version	Delegate For
	Dima Poe	5/21/2021	1	
	Operational Analysis: Please consider conducting the analysis for the two scenarios (existing condition and roundabout) with the same software for consistency and comparability. Synchro should still allow for an HCM 2010 analysis/report if required.			
	Benazir Portal	6/23/2021	1	
	Understood. Please refer to Page 16 of the report for justification on the use of HCM 6th Edition versus SIDRA HCM 2010 results. No action needed in response to the comment. Thank you.			

Name	Assignment	Due Date	Status	Comments
Dionne Richardson	LEAD REVIEWER	5/21/2021	ACTIVE	0*
Name	Assignment	Due Date	Status	Comments
Elio Espino	REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Elisa Azcona	REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Erki Suarez	LEAD REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Felipe Gonzalez	REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Felix Hernandez	LEAD REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Gustavo Firpi	REVIEWER	5/21/2021	ACTIVE	0*

Name		Assignment	Due Date	Status	Comments
Hailing Zhang		LEAD REVIEWER	5/21/2021	ACTIVE	0
Name		Assignment	Due Date	Status	Comments
Hector Hartmann		LEAD REVIEWER	5/21/2021	ACTIVE	0*
Name		Assignment	Due Date	Status	Comments
Javier Hurtado		REVIEWER	5/21/2021	ACTIVE	0
Name		Assignment	Due Date	Status	Comments
Javier Rodriguez		LEAD REVIEWER	5/21/2021	ACTIVE	0*
Name		Assignment	Due Date	Status	Comments
Jesus Perez		IN-HOUSE PROJECT MANAGER	5/21/2021	ACTIVE	0
Name		Assignment	Due Date	Status	Comments
Jinyan Lu		LEAD REVIEWER	5/21/2021	ACTIVE	0
Name		Assignment	Due Date	Status	Comments
JOHN MCWILLIAMS		REVIEWER	5/21/2021	ACTIVE	0*
Name		Assignment	Due Date	Status	Comments
Judy Solaun-Gonzalez		LEAD REVIEWER	5/21/2021	ACTIVE	0
Name		Assignment	Due Date	Status	Comments
Ken Jeffries		LEAD REVIEWER	5/21/2021	ACTIVE	0
Name		Assignment	Due Date	Status	Comments
Kevin Might		REVIEWER	5/21/2021	ACTIVE	1
No	Status	Current Holder	Reference	Categories	
4	COMMENT AGREED WITH		8	LANDSCAPING	
	Created By	Created On	Version	Delegate For	
	Kevin Might	5/20/2021	1		
	Proposed roadway will require canopy and root trimming of trees near the north end to accommodate new layout and to provide appropriate vertical clearances per ADA and the FDOT Maintenance Rating Program. One canopy tree at the southeast corner appears to have lost major portions of its structure such that its removal to accommodate the new layout would be appropriate. The work should be performed per FDOT Standard Plans Index 110-100 at the direction of a certified arborist.				
	Benazir Portal	5/24/2021	1		
	Noted. This comment will be addressed under the final design stage. Thank you.				
Name		Assignment	Due Date	Status	Comments
Kirenia Borbolla		LEAD REVIEWER	5/21/2021	ACTIVE	0
Name		Assignment	Due Date	Status	Comments
Krish Dial		REVIEWER	5/21/2021	ACTIVE	0
Name		Assignment	Due Date	Status	Comments
Leonard Salazar		LEAD REVIEWER	5/21/2021	ACTIVE	0
Name		Assignment	Due Date	Status	Comments
Luis Lopez		REVIEWER	5/21/2021	ACTIVE	0
Name		Assignment	Due Date	Status	Comments
Marvin Guillen		REVIEWER	5/21/2021	ACTIVE	0
Name		Assignment	Due Date	Status	Comments
Mauricio Gomez		LEAD REVIEWER	5/21/2021	ACTIVE	0

Name	Assignment	Due Date	Status	Comments
Max Imberman	REVIEWER	5/21/2021	ACTIVE	1
No	Status	Current Holder	Reference	Categories
3	COMMENT AGREED WITH		General Comment	CULTURAL RESOURCES
Created By	Created On	Version	Delegate For	
Max Imberman	5/20/2021	1		
The preliminary cultural review identified no archaeological or historic properties within the area recommended for improvements. The Planning and Environmental Management Office (PLEMO) will need to revisit this project during design once the full scope of work and funding information is available. This information is needed to confirm an area of potential effect (APE) and to determine the appropriate scope of coordination with state and/or federal agencies. If you have any questions or require clarification for these comments, please contact Max Adriel Imberman at 813-330-9111/ max_imberman@janus-research.com.				
Benazir Portal	5/24/2021	1		
Noted. No action needed in response to the comment at this study stage. Thank you.				

Name	Assignment	Due Date	Status	Comments
Michael Hughes	REVIEWER	5/21/2021	ACTIVE	0*
Name	Assignment	Due Date	Status	Comments
Michael Miller	REVIEWER	5/21/2021	ACTIVE	1
No	Status	Current Holder	Reference	Categories
1	COMMENT AGREED WITH			CONTAMINATION
Created By	Created On	Version	Delegate For	
Michael Miller	5/18/2021	1		
There are no documented contaminated sites within a 500-foot radius of the project corridor. Therefore, no contamination impacts are anticipated.				
Benazir Portal	5/24/2021	1		
Noted. No action needed in response to the comment. Thank you.				

Name	Assignment	Due Date	Status	Comments
Mikhail Dubrovsky	LEAD REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
NAGUL PRABAHARAN	REVIEWER	5/21/2021	ACTIVE	1
No	Status	Current Holder	Reference	Categories
10	COMMENT AGREED WITH			SAFETY
Created By	Created On	Version	Delegate For	
NAGUL PRABAHARAN	5/21/2021	1		
Looks like roundabout is the best option for this location to reduce the number of crashes. Right-of-way constraints can be an issue.				
Benazir Portal	5/24/2021	1		
No ROW impacts are anticipated with the proposed improvements. Please let us know if additional information is needed to clarify this project component. Thank you.				

Name		Assignment	Due Date	Status	Comments
Osvaldo Diaz		REVIEWER	5/21/2021	ACTIVE	6
No	Status	Current Holder	Reference	Categories	
13	COMMENT AGREED WITH		Proposed improvement, page 18, plan view sheet 8	ROADWAY	
	Created By		Created On	Version	Delegate For
	Osvaldo Diaz		5/21/2021	1	
	Proposed improvement, page 18, plan view sheet 8. The geometric information of proposed roundabouts should be provided in the diagram as radius of the curves, lane crosswalk distances etc. It is important to develop roadway geometry that encourages drivers to gradually slow down as they approach the roundabout.				
	Benazir Portal		5/24/2021	1	
	The proposed geometry limits roundabout entry speed to 25 mph as recommended by NCHRP Report 672. Fastest path diagrams will be included in the final report. Detailed radius and other distances will be provided during the final design stage. No further action is needed in response to the comment. Thank you.				
No	Status	Current Holder	Reference	Categories	
14	COMMENT AGREED WITH		Proposed improvement, page 18, plan view sheet 8	LANDSCAPING	
	Created By		Created On	Version	Delegate For
	Osvaldo Diaz		5/21/2021	1	
	Proposed improvement, page 18, plan view sheet 8. Consider proposing prominent landscaping in the center of the island to increase visibility of the central island and provides a visual queue to approaching drivers that they are entering a low-speed environment.				
	Benazir Portal		5/24/2021	1	
	Noted. This comment will be addressed under the final design stage. Thank you.				
No	Status	Current Holder	Reference	Categories	
15	RESPONSE SUBMITTED	Osvaldo Diaz	Proposed improvement, page 18, plan view sheet 8.	ROADWAY,SIGNING AND MARKING	
	Created By		Created On	Version	Delegate For
	Osvaldo Diaz		5/21/2021	1	
	Proposed improvement, page 18, plan view sheet 8. Proposed crosswalk in the east side should be divide in two crosswalk and connected on a refuge area for the pedestrian in the splitter island, per FDM 213-1.				
	Benazir Portal		6/23/2021	1	
	The splitter island nose meets the preferred radius of 2'-0". Placing the crosswalk east of the existing transmission line would place the pedestrian behind the pole before crossing and shield them from motorist view. It is recommended to keep the crosswalk as shown. No further action is needed in response to the comment. Thank you.				
No	Status	Current Holder	Reference	Categories	
16	COMMENT AGREED WITH		Proposed improvement, page 18, plan view sheet 8	ROADWAY,SIGNING AND MARKING	
	Created By		Created On	Version	Delegate For
	Osvaldo Diaz		5/21/2021	1	
	Proposed improvement, page 18, plan view sheet 8. Proposed crosswalks in the north, west and south sides should be connected to a wider area of the splitter island to provide a bigger pedestrian refuge, per FDM Exhibit 213-1.				
	Benazir Portal		5/24/2021	1	
	The proposed refuge islands meet the 6'-0" minimum criteria requirement. No further action is needed in response to the comment. Thank you.				
No	Status	Current Holder	Reference	Categories	
17	RESPONSE SUBMITTED	Osvaldo Diaz	Proposed improvement, page 18, plan view sheet 8	SIGNING AND MARKING	
	Created By		Created On	Version	Delegate For
	Osvaldo Diaz		5/21/2021	1	

Proposed improvement, page 18, plan view sheet 8. Key Right/Object marker (R4-7)/OM1-1 signs should be provided in the narrow parts of splitter island, per FDM Exhibit 213-3.

Benazir Portal 6/23/2021 1

The proposed splitter islands are designed to be fully mountable and signs would be frequently damaged if installed. In addition, NCHRP Report 672 recommends these sign assemblies on NON-MOUNTABLE splitter islands. Median noses can be painted with high retro reflective yellow paint for better visibility. Note that FDM standards are for full size and multi-lane roundabouts.

No	Status	Current Holder	Reference	Categories
18	COMMENT AGREED WITH		On Appendix H, Probably Cost, sheet 1.	ESTIMATES,ROADWAY

Created By	Created On	Version	Delegate For
Oswaldo Diaz	5/21/2021	1	

On Appendix H, Probably Cost, sheet 1. The pay item Type D curb should be included for the central Island curb, per FDM Exhibit 213-2.

Benazir Portal 5/24/2021 1

Noted. The cost estimate has been updated to include this pay item. No further action is needed in response to the comment. Thank you.

Name	Assignment	Due Date	Status	Comments
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Pablo Orozco	LEAD REVIEWER	5/21/2021	ACTIVE	0
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Name	Assignment	Due Date	Status	Comments
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Paola Baez	REVIEWER	5/21/2021	ACTIVE	0*
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Name	Assignment	Due Date	Status	Comments
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Patrick Marchant	LEAD REVIEWER	5/21/2021	ACTIVE	0
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Name	Assignment	Due Date	Status	Comments
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Phil Steinmiller	REVIEWER	5/21/2021	ACTIVE	0*
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Name	Assignment	Due Date	Status	Comments
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Rafael Diaz	REVIEWER	5/21/2021	ACTIVE	0*
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Name	Assignment	Due Date	Status	Comments
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Rodrigo Ley	LEAD REVIEWER	5/21/2021	ACTIVE	0
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Name	Assignment	Due Date	Status	Comments
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Rudy Westerman	REVIEWER	5/21/2021	ACTIVE	1
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No	Status	Current Holder	Reference	Categories
5	COMMENT AGREED WITH		General Comment	CULTURAL RESOURCES

Created By	Created On	Version	Delegate For
Rudy Westerman	5/20/2021	1	

My comments are contained within the comment entered by Max Imberman.

Benazir Portal 5/24/2021 1

Noted. No action needed in response to the comment. Thank you.

Name	Assignment	Due Date	Status	Comments
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Ryan Mansfield	LEAD DESIGNER	5/24/2021	ACTIVE	0
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Name	Assignment	Due Date	Status	Comments
Simon Gutierrez	REVIEWER	5/21/2021	ACTIVE	1
No	Status	Current Holder	Reference	Categories
2	COMMENT AGREED WITH			MAINTENANCE
	Created By	Created On	Version	Delegate For
	Simon Gutierrez	5/19/2021	1	
	No comments since the report was for a section outside FDOT ROW			
	Benazir Portal	5/24/2021	1	
	Noted. No action needed in response to the comment. Thank you.			
Name	Assignment	Due Date	Status	Comments
Simon Prilutsky	REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Stefan Escanes	REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Steven James	LEAD REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Tiffany Gehrke	LEAD REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
X Negrin	LEAD REVIEWER	5/21/2021	ACTIVE	0*
Name	Assignment	Due Date	Status	Comments
Xiomara Nunez	LEAD REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Yimy Perez	REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Zachary Taylor	REVIEWER	5/21/2021	ACTIVE	0
Name	Assignment	Due Date	Status	Comments
Zurelys Perez De Alejo	LEAD REVIEWER	5/21/2021	ACTIVE	0