MPO

GENERAL PLANNING CONSULTING SERVICES

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Connecting 25th Street to the HEFT

Prepared for:

MIAMI-DADE MPO

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MPO Disclaimers

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1. PURPOSE

The purpose of this report is to develop a detailed conceptual plan to provide a direct connection between NW 25th Street and the northbound of Homestead Extension of the Florida's Turnpike (HEFT), complying with the design guidelines of Florida's Turnpike Enterprise. **Figure 1** depicts the location map of the study area in Miami-Dade County.

Figure 1 - Location Map

2. BACKGROUND AND PREVIOUS STUDIES

The Freight Transportation Advisory Committee (FTAC) of the Miami-Dade Metropolitan Planning Organization (MPO) passed a resolution to conduct a study for a new interchange at NW 25th Street and HEFT, in November 2008. A study "Proposed Interchange at the HEFT and NW 25th Street" was completed by the Florida's Turnpike Enterprise in March 2009. This study evaluated the interchange feasibility and recommended not to build a new interchange at this location, based on low volumes generated by the new interchange, the close proximity of neighbor interchanges and the significant added weaving congestion to HEFT. As mentioned in other studies (e.g. City of Doral 2010 Transportation Master Plan and MPO Miami-Dade Freight Parking Study, 2011), the freight transportation industry and many businesses related to this industry have been suffering increments of their costs, and reduction of their efficiencies that affect increase in costs of goods. MPO has conducted several studies to find out solutions for a deficient freight movement system in Miami-Dade County. Past studies also point out the called "Warehouse District", located on NW 25th Street next to the Palmetto Expressway, which is a transit point for a considerable portion of freight arriving/leaving at the Miami International Airport (MIA) West Cargo Area and Port of Miami. The SR 836/Dolphin Expressway, SR 826/Palmetto Expressway, SR 821/Florida's Turnpike, NW 36th/41st Street, and NW 25th Street are used to access these warehouses. Most freight movement to and from the warehouses takes place during the daytime, resulting in severe congestion on local north south streets as well as NW 25th Street and NW 36th/NW 41st Street. The NW 25th Street viaduct recently built to connect the WCA to Palmetto Expressway (and currently under expansion toward the west) will provide a more efficient freight movement between the warehouses and MIA West Cargo Area. However, there is a need to relieve traffic on the Palmetto Expressway, especially for the NW 25th Street west to north movement, by developing alternate routes for a better access to HEFT from the Warehouse District. These alternatives should consider options to reducing truck volume on the local streets, by extending and/or connecting NW 117th Ave to HEFT and/or developing intersection capacity improvements on NW 25th Street and NW 36th /41st Street.

3. STUDY AREA AND EXISTING CONDITIONS

The study area is bounded by NW 12th Street to the south, NW 36th/41st Street to the north, SR 826/Palmetto Expressway to the east and SR 821/HEFT to the west, as illustrated in **Figure 2**. The study area is located across part of the cities of Doral and Sweetwater in Miami-Dade County. The predominant land use is "Industrial and Office" and the entire study area is within the Miami-Dade County Urban Development Boundary, as illustrated in the "Miami-Dade Adopted 2015 and 2025 Land Use Plan", included in **Appendix A**.

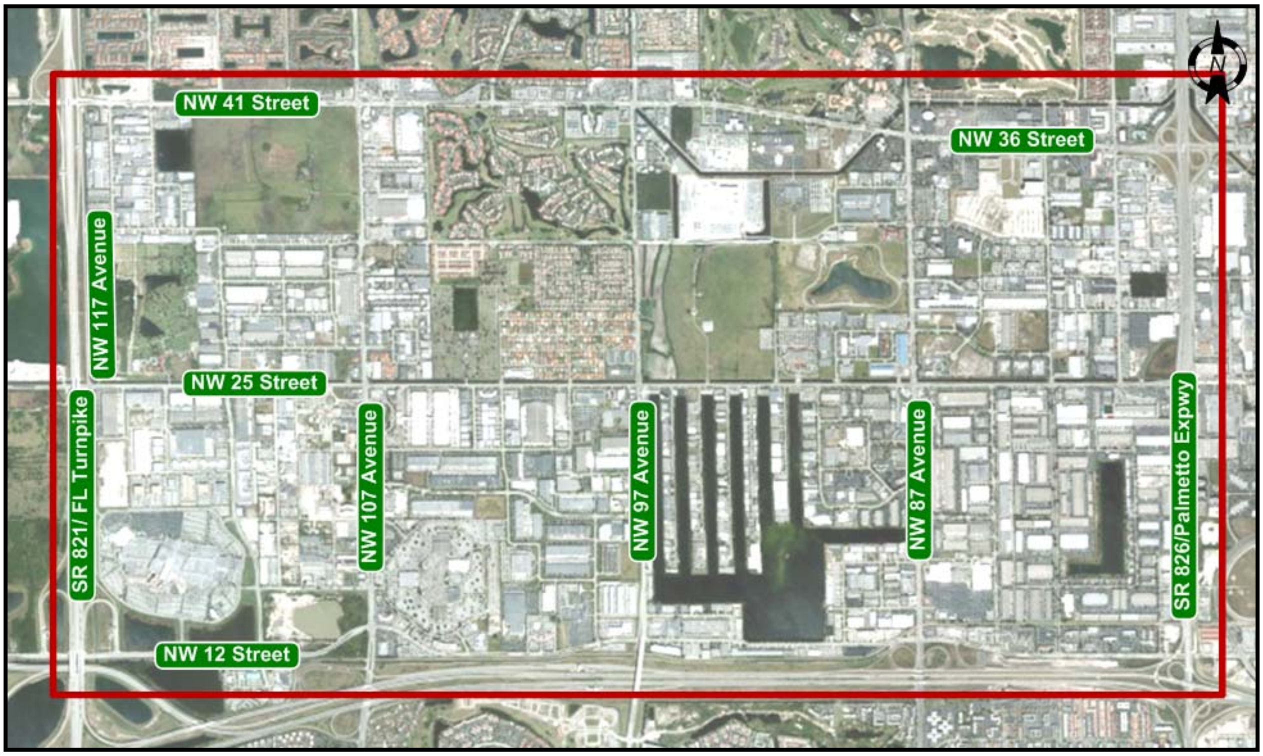
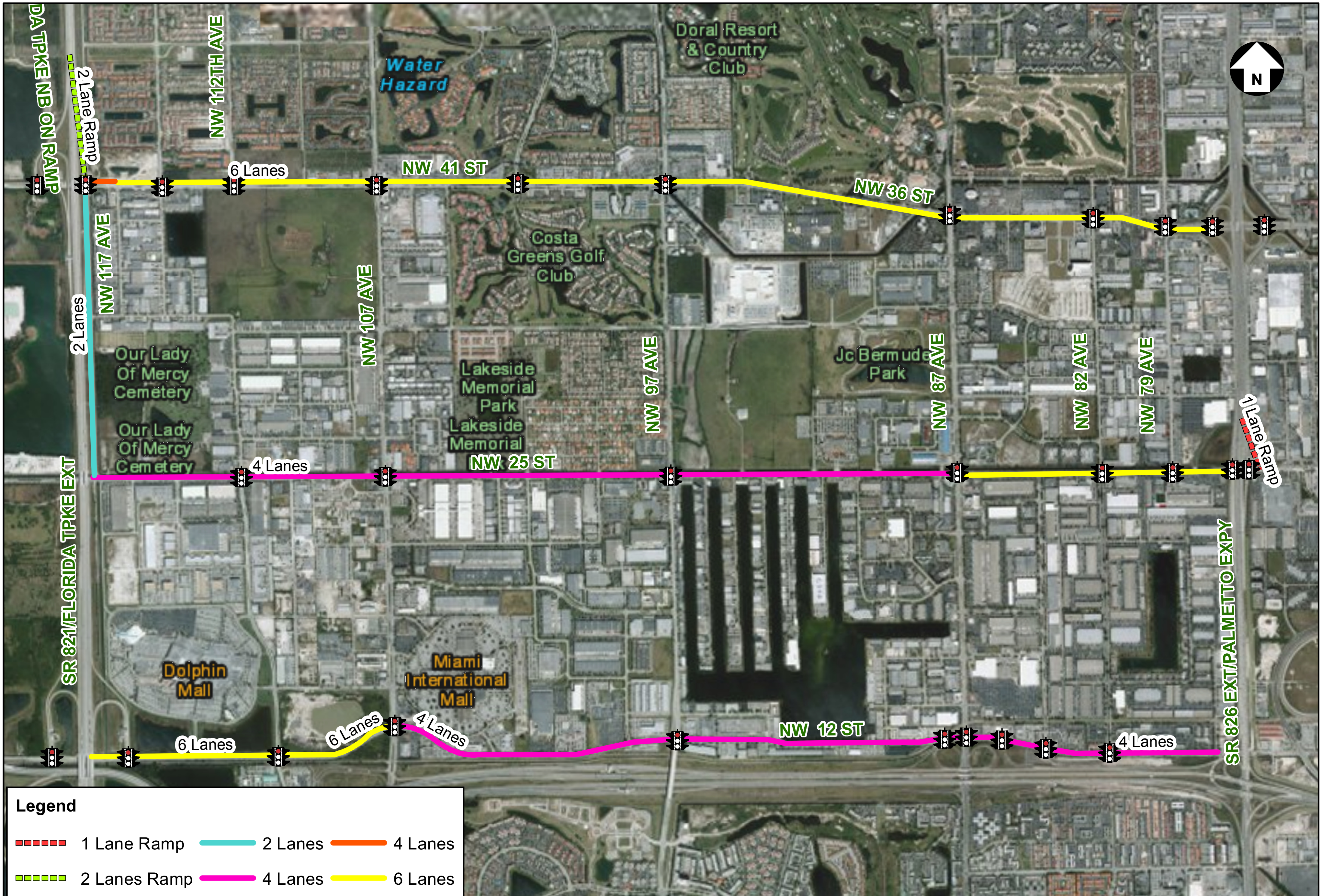


Figure 2 - Study Area

For each study corridor, NW 12th Street, NW 25th Street, NW 36th/41st Street and NW 117th Avenue, the existing conditions including number of through lanes and signalized intersections are shown in **Figure 3**. It should be noted that NW 36th/41st Street is already built up to 6-lane corridor while the other two corridors have room for widening since NW 25th Street and NW 12th Street are 4-lane corridors with short 6-lane segments: one on NW 25th Street next to SR 826/Palmetto Expressway and one on NW 36th Street next to SR 821/HEFT. Also noticeable is a difference in number of lanes accessing the NB On-Ramps: the ramp from NW 41st Street to SR 821/HEFT is a two-lane facility while the ramp from NW 25th Street to SR 826/Palmetto Expressway is one-lane only. Typical section details for each corridor are described below.



Miami-Dade Metropolitan Planning Organization | MARLIN ENGINEERING, INC. | Connecting NW 25th Street to HEFT | Study Corridors | Fig. 3

3.1. NW 12th Street Existing Conditions

NW 12th Street from the SR 821/HEFT to the SR 826/Palmetto Expressway is one of the study corridors and defines the southern boundary of the study area. This roadway segment is adjacent to industrial and commercial land use along the north and south sides of the corridor. Access is provided to SR 821/HEFT via an interchange and to SR 836/Dolphin Expressway through a westbound on-ramp. This segment of NW 12th Street is a county road, classified as an Urban Minor Arterial with a posted speed of 40 mph. The typical section varies: a six-lane divided roadway with a raised median and turning lanes from the SR 821/HEFT to NW 107th Avenue, a four-lane divided roadway with a raised median and turning lanes from NW 107th Avenue to NW 97th Avenue and from NW 87th Avenue to the SR 826/Palmetto Expressway, and a four-lane divided roadway (with a two-way left-turn lane paved median) from NW 97th Avenue to NW 87th Avenue, as illustrated in **Figure 4**.

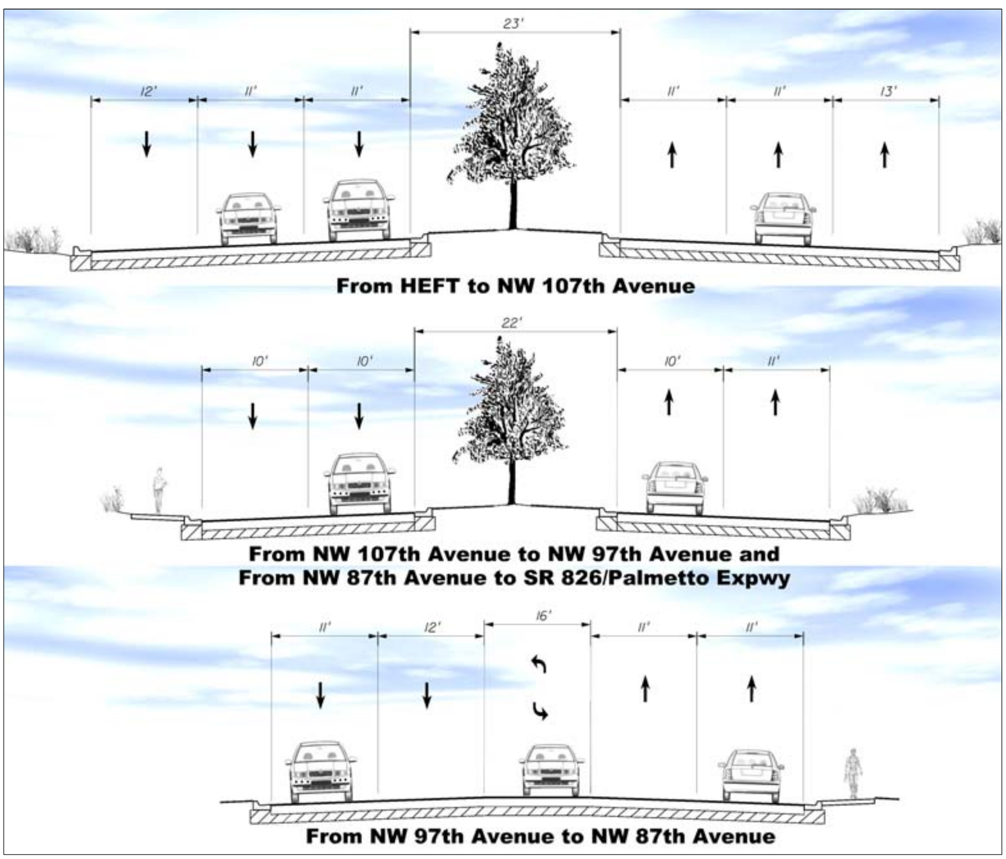


Figure 4 - Typical Section (NW 12th Street)

3.2. NW 25th Street Existing Conditions

The NW 25th Street roadway segment from the SR 821/HEFT to the SR 826/Palmetto Expressway is bounded by industrial and commercial land use along the north and south sides of the corridor. Access is provided to SR 826/Palmetto Expressway via an interchange; no access is provided to the SR 821/HEFT from NW 25th Street. This county road is classified as an Urban Collector from NW 117th Avenue to NW 107th Avenue and as an Urban Minor Arterial from NW 107th Avenue to the SR 826/Palmetto Expressway. The posted speed is 40 mph from the SR 821/HEFT to NW 79th Avenue and 35 mph from NW 79th Avenue to the SR 826/Palmetto Expressway. The typical section varies: a four-lane divided roadway (with turning lane paved median) from the SR 821/HEFT to NW 87th Avenue, a four-lane divided roadway (with turning lane paved median) from NW 87th Avenue to NW 82nd Avenue and a six-lane divided roadway with a raised median and turning lanes from NW 82nd Avenue to the SR 826/Palmetto Expressway, as illustrated in **Figure 5**. The future expansion of the NW 25th Street viaduct from NW 82nd Avenue to the SR 826/Palmetto Expressway is also depicted in the figure.

3.3. NW 36th/41st Street Existing Conditions

NW 36th/41st Street from the SR 821/HEFT to the SR 826/Palmetto Expressway defines the northern boundary of the study area. This corridor is adjacent to commercial and office land use along the north side of the corridor and industrial, commercial, office and residential land uses along the south side of the corridor. Access is provided to SR 821/HEFT and to SR 826/Palmetto Expressway via interchanges located on the western and eastern limits of the study corridor, respectively. This county road is classified as an Urban Other Principal Arterial with a posted speed of 40 mph. The typical section is a six-lane divided roadway with a raised median and turning lanes from the HEFT to the Palmetto, as illustrated in **Figure 6**.

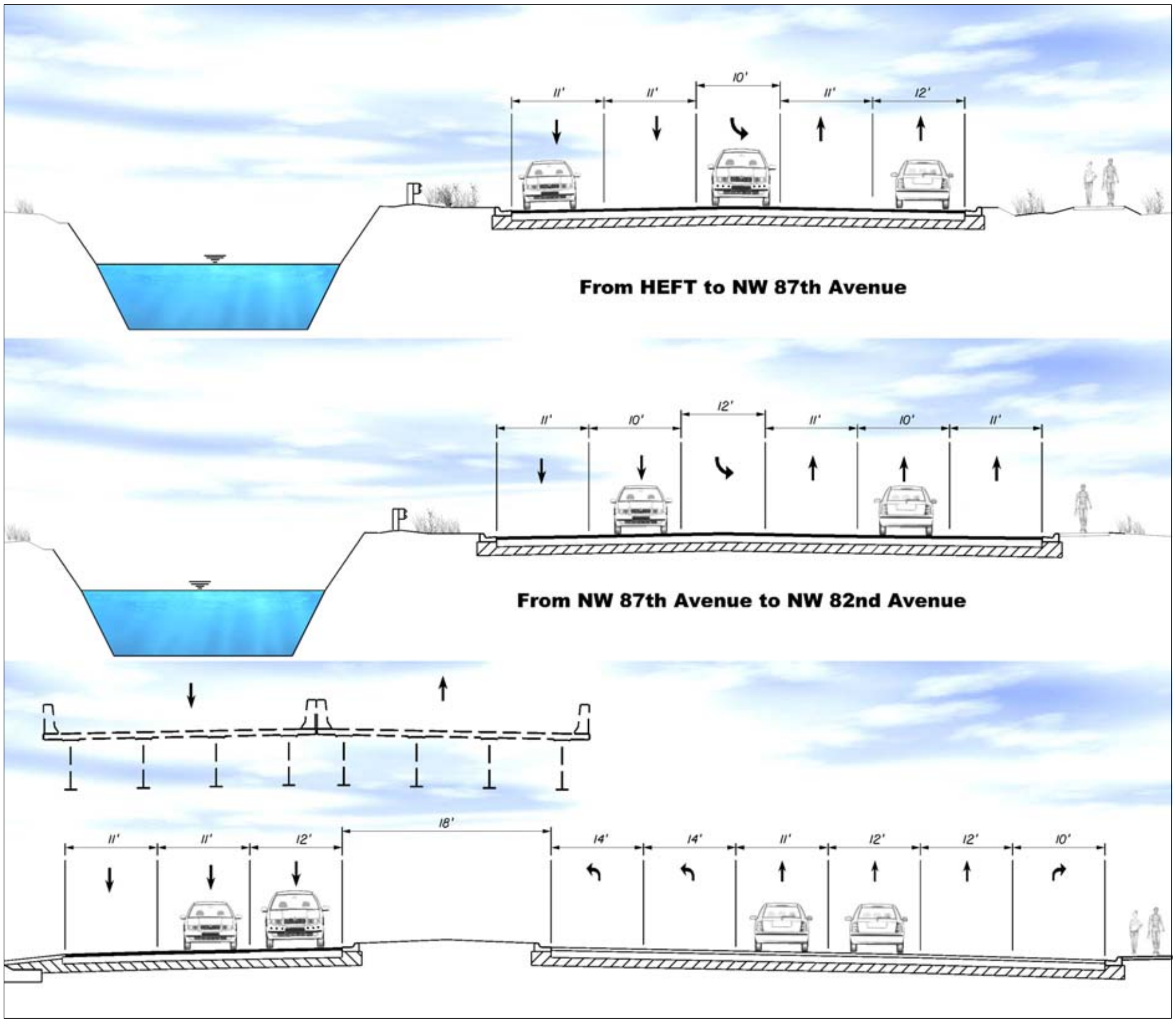


Figure 5 - Typical Section (NW 25th Street)

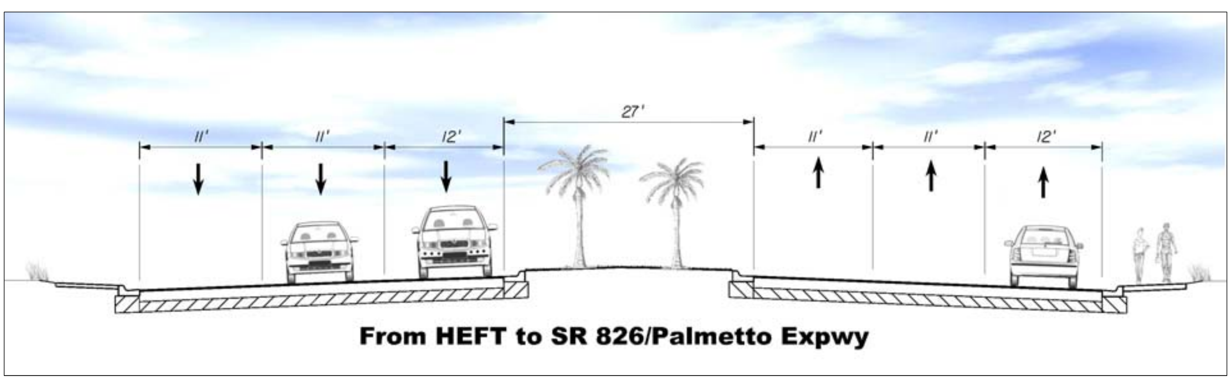


Figure 6 - Typical Section (NW 36th/41st Street)

3.4. NW 117th Avenue Existing Conditions

NW 117th Avenue runs in the north-south direction from NW 25th Street to NW 41st Street, separated by a drainage canal adjacent to industrial, business and office land use on the east side, and the SR 821/HEFT along the west side of the corridor. NW 117th Avenue is connected to NW 25th Street via an un-signalized intersection; however, NW 117th Avenue does not connect to NW 41st Street. This county road is classified as a local road with a posted speed of 40 mph. The typical section is a two-way, two-lane undivided roadway as illustrated in **Figure 7**.

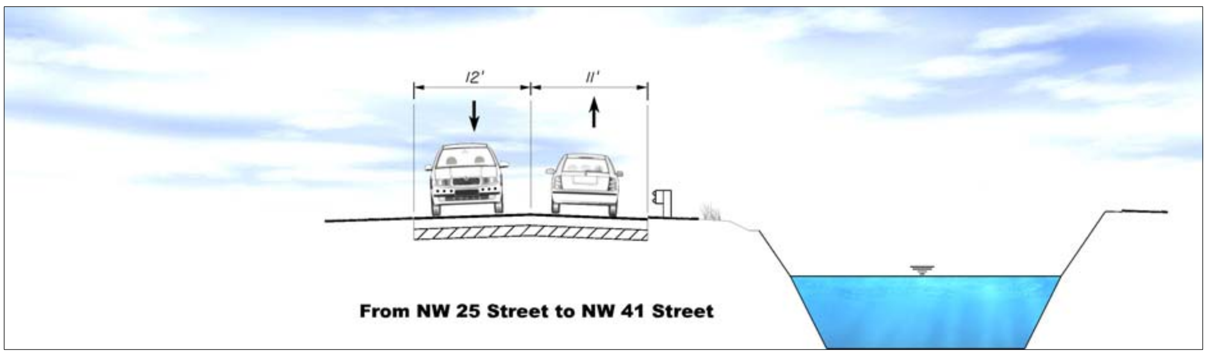


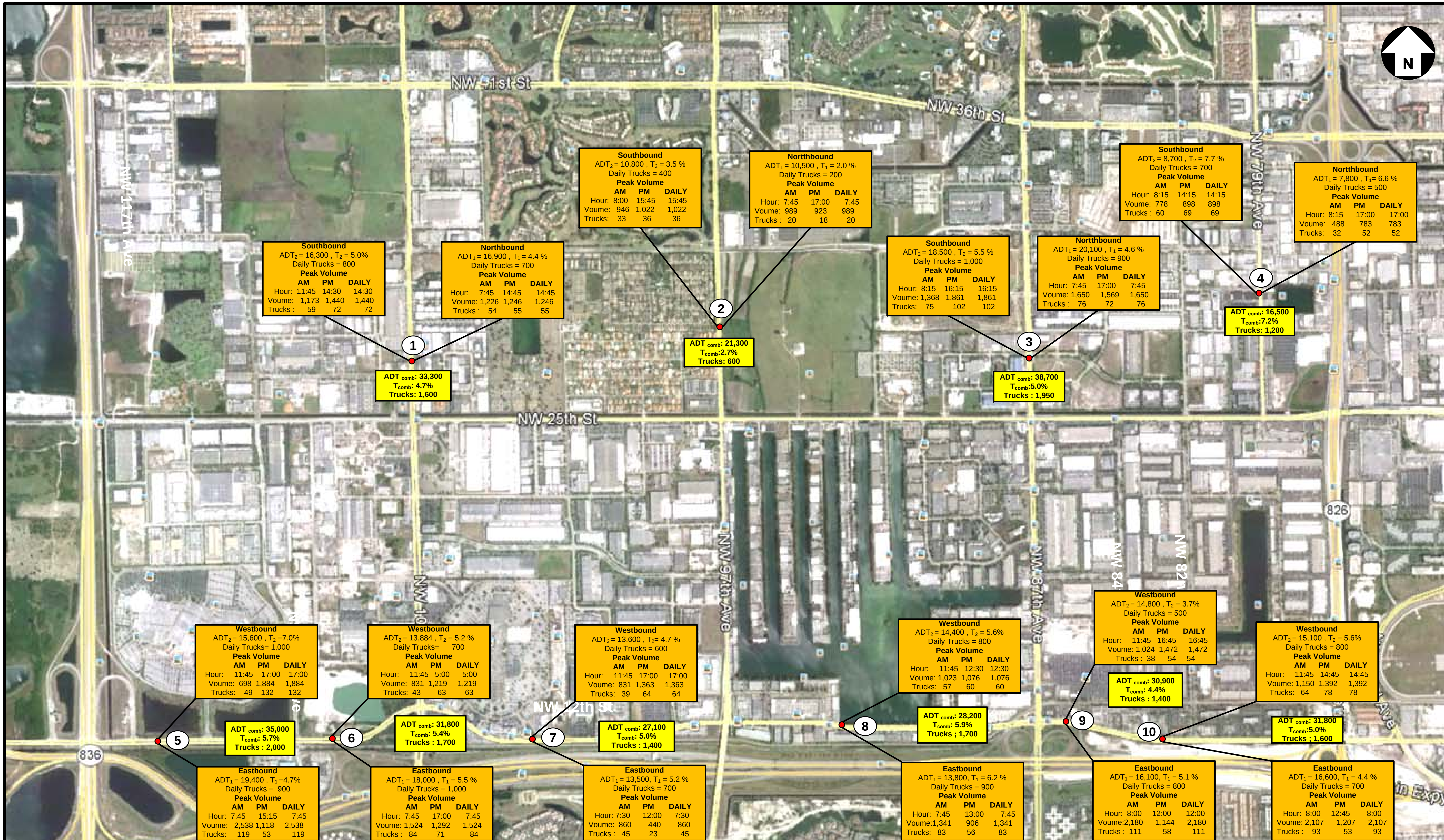
Figure 7 - Typical Section (NW 117th Avenue)

4. TRAFFIC DATA COLLECTION

Available existing and historical traffic data in the study area were gathered by MEI from 2011 FDOT Traffic Counts and 2012 Miami-Dade County Traffic Counts. This data included some links of the study corridors and the connecting ramps with SR 826/Palmetto Expressway and SR 821/HEFT. Summary of existing available counts are presented in **Appendix B.** Additionally, vehicle traffic counts, both 24-hour volume/classification mechanical counts and manual four-hour turning movement counts (AM and PM peak periods), were collected from March to June 2012 in the study area, including northbound ramps at SR 826/Palmetto and SR 821/HEFT.

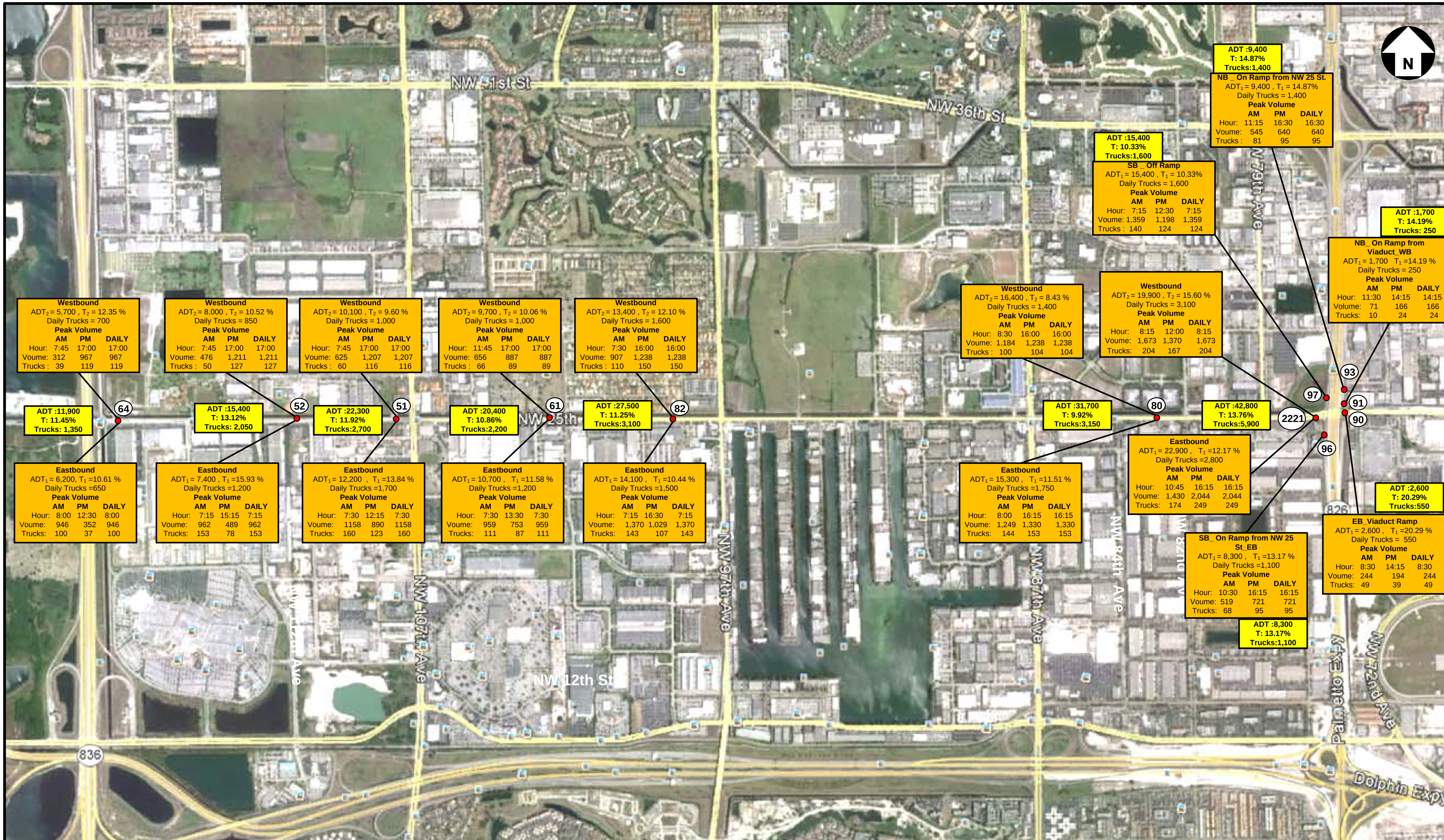
4.1. 24-Hour Mechanical Counts

Continuous 24-Hour mechanical traffic counts for total vehicular traffic and heavy vehicles (trucks) were collected along three east-west main corridors NW 12th Street, NW 25th Street, and NW 36th /41st Street; and along five north-south corridors: NW 114th Avenue, NW 107th Avenue, NW 97th Avenue, NW 87th Avenue and NW 79th Avenue. Also, additional counts were collected at the SR 826/Palmetto Expressway and SR 821/HEFT ramps. These traffic counts were collected during the months of March through June of 2012. **Figures 8, 9 and 10** illustrate for each corridor segment the summaries of existing Average Daily Traffic (ADT), Truck Volume and T% factor for each direction and combined directions. In those figures, the information is provided for AM and PM peak hours. It can be observed in the above figures that the east-west corridors have higher volumes of daily traffic circulating toward the SR 826/Palmetto than to SR 821/HEFT, except for NW 12th Street corridor where traffic volumes are about the same next to both expressways. On the other hand, higher daily volumes of trucks are circulating toward SR 826/Palmetto Expressway than toward SR 821/HEFT along NW 25th Street and NW 36th /41st Street corridors, while on NW 12th Street corridors truck volumes though lower are approximately constant along the corridor. On main north-south roads, higher traffic volumes (including trucks) are circulating on NW 107th Avenue and NW 87th Avenue. For each corridor roadway segment, summary tables of mechanical traffic counts are presented in **Appendix C**, however, due to large pieces of information, the corresponding synopsis reports are submitted separately in a CD digital file**.**



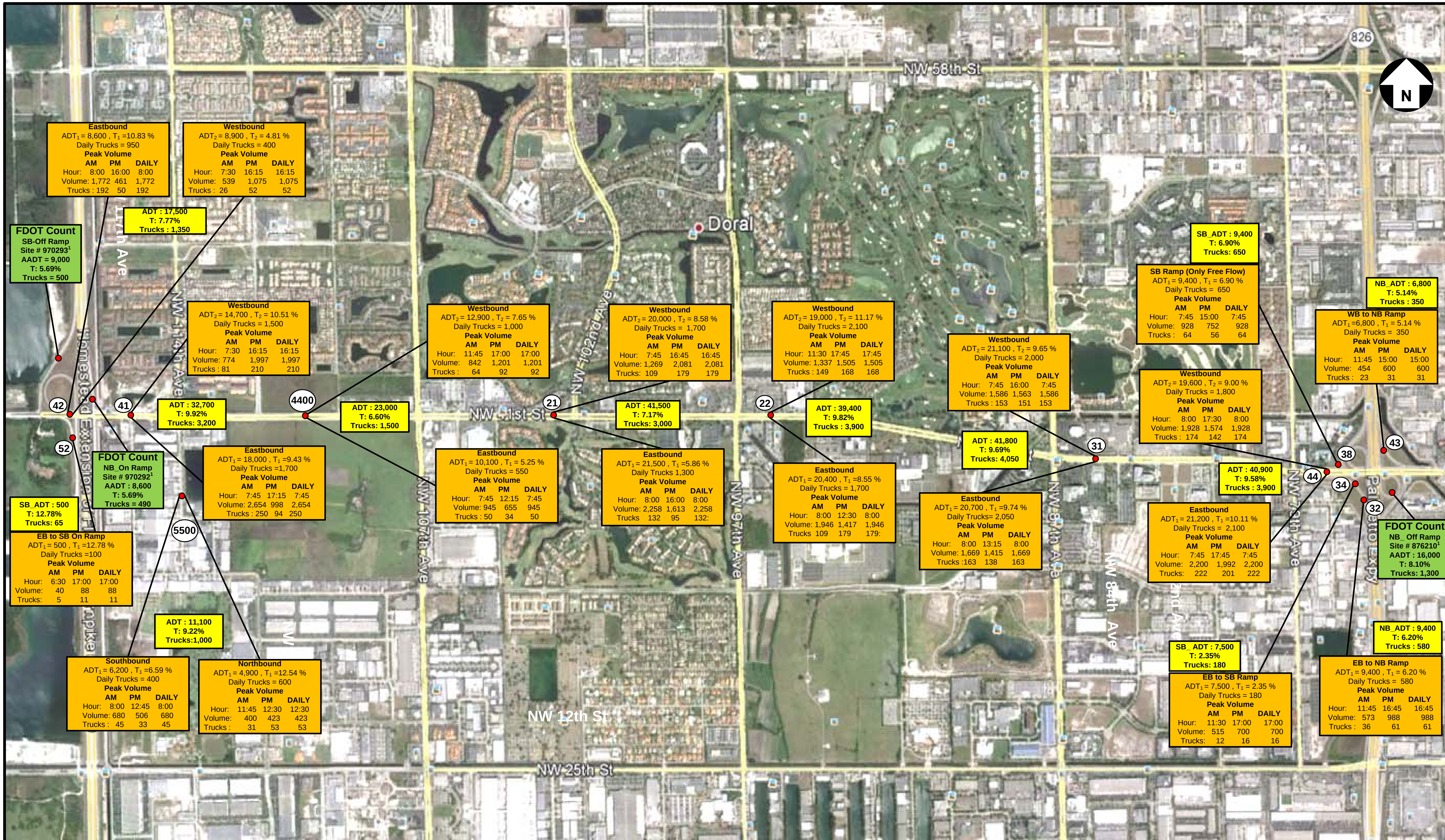
Miami-Dade Metropolitan Planning Organization	MARLIN ENGINEERING INC.	Connecting NW 25th Street to the HEFT	Existing ADT / Truck Volumes (NW 12th Street Corridor & NW 107th / 97th / 87th /79th Avenues)	Fig. 8

Note: Figure is not to scale.



Miami-Dade Metropolitan Planning Organization	MARLIN ENGINEERING INC.	Connecting NW 25th Street to the HEFT	Existing ADT / Truck Volumes (NW 25th Street Corridor)	Fig. 9

Note: Figure is not to scale.



Miami-Dade Metropolitan Planning Organization	MARLIN ENGINEERING, INC.	Connecting NW 25th Street to the HEFT	Existing ADT / Truck Volumes (NW 36th / 41st Street Corridor)	Fig. 10

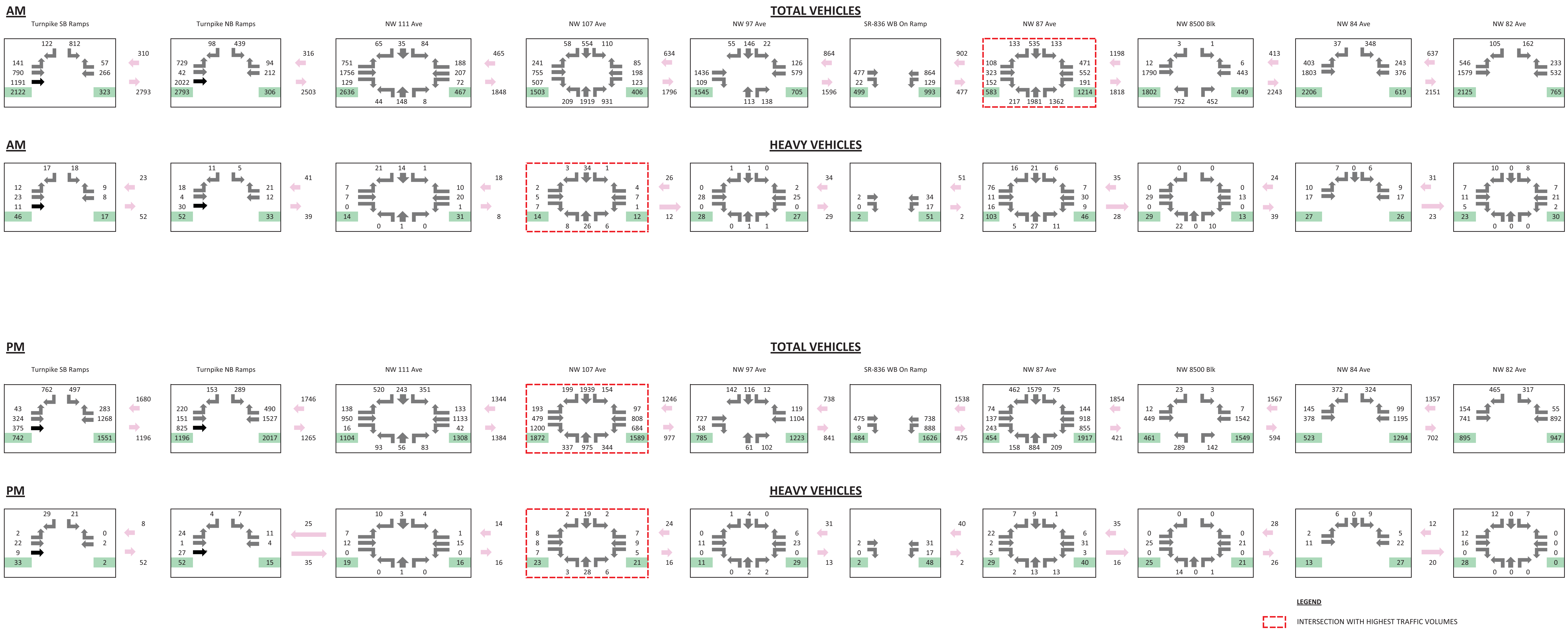
Note: Figure is not to scale.

4.2. Four-Hour Turning Movement Counts

Four-hour turning movement counts (TMCs), including heavy vehicle (truck) volumes were collected along each corridor during the months of March through May 2012 for two peak periods, morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM). A total of 31 intersections for TMCs (ten along NW 12th Street, nine along NW 25th Street and twelve along NW 36th/41st Street) were selected for the study counts. Results of raw turning movement counts are illustrated in **Figures 11, 12 and 13** for each selected intersection along each study corridor. Summary tables of turning movement counts for AM and PM peak hours for each corridor are presented in **Appendix C** and synopsis reports are submitted separately in a CD digital file**.**

The figures also show the turning movement counts for both total vehicles and heavy vehicles. It is observed for each corridor that the following intersections have the highest volumes in total vehicles and/or heavy vehicles, during AM and PM peak hours:

- NW 12th Street Corridor:
  AM – NW 87 Ave (Total Vehicles), NW 107 Ave (Heavy Vehicles)
  PM - NW 107th Avenue (Total Vehicles & Heavy Vehicles)
- NW 25th Street Corridor
  AM – NW 87 Ave (Total Vehicles & Heavy Vehicles)
  PM - NW 87 Ave (Total Vehicles & Heavy Vehicles)
- NW 36th /41st Street Corridor
  AM – NW 97 Ave (Total vehicles), SR 826/Palmetto Expressway SB Ramp (Heavy Vehicles)
  PM – NW 79 Ave (Total Vehicles), NW 87 Ave (Heavy Vehicles)



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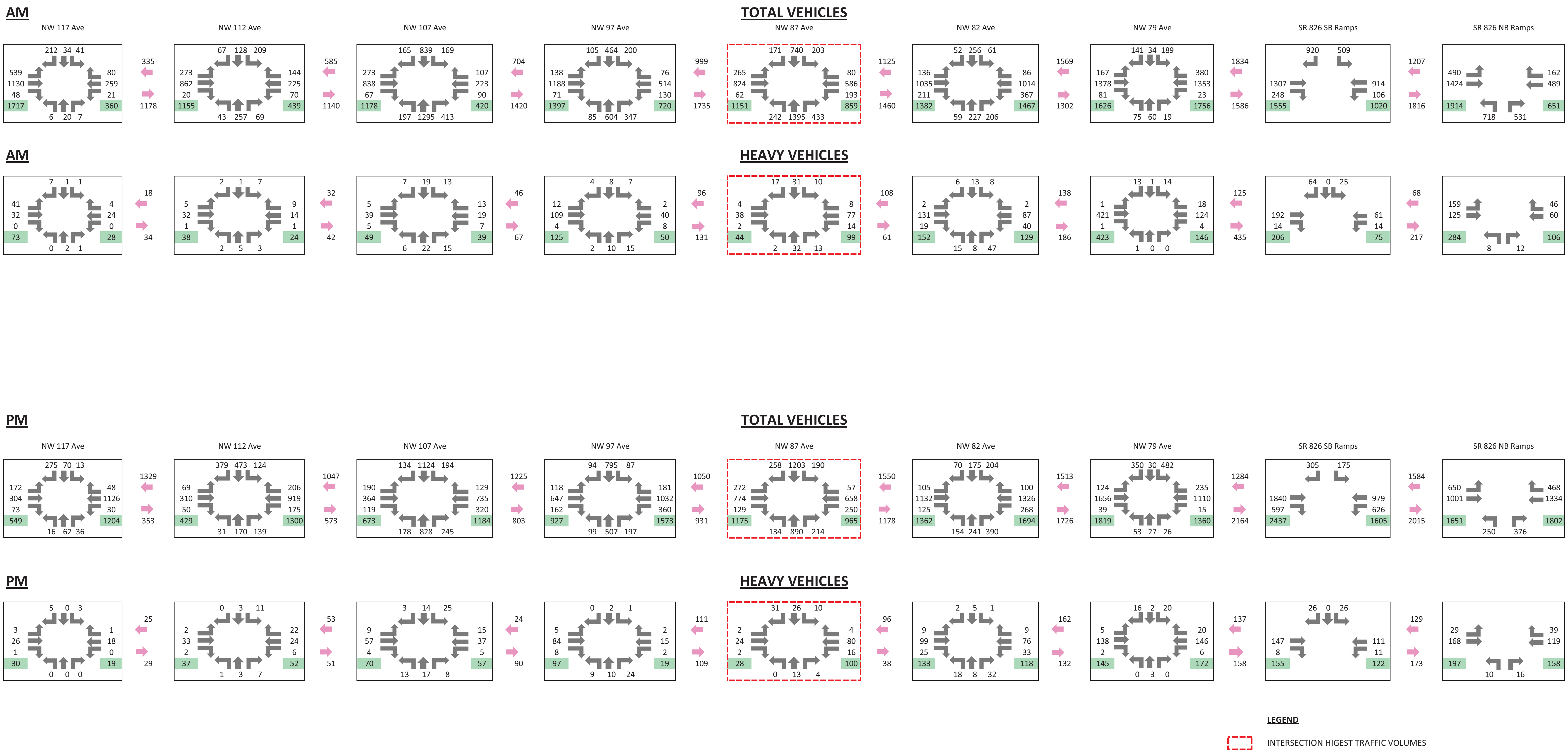
Connecting 25th Street to the HEFT

AM / PM Peak Hour Turning Movement Counts (Along NW 12st Street Corridor)

Fig. 11



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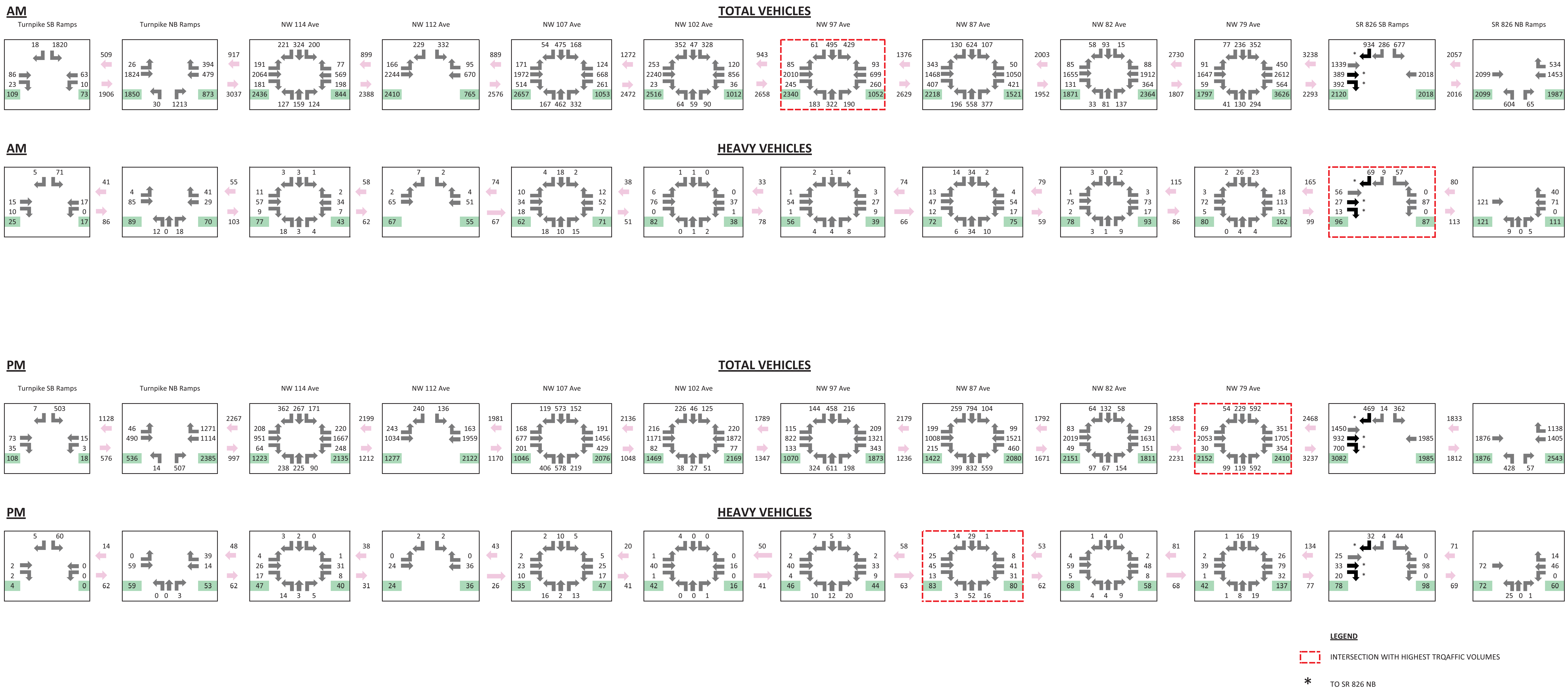
Connecting 25th Street to the HEFT

AM / PM Peak Hour Turning Movement Counts (Along NW 25st Street Corridor)

Fig. 12



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Connecting 25th Street to the HEFT

AM / PM Peak Hour Turning Movement Counts (Along NW 36th / 41st Street Corridor)

Fig. 13

4.3. Heavy Vehicles Volume Spatial Distribution

For each study corridor, using the results of 24-hr classification counts, the directional variation of heavy vehicle volumes for the AM and PM peak hours are shown in **Figures 14 and 15**. During both the AM and PM peak hours, on NW 36th /41st Street and NW 25th Street corridors, higher heavy traffic volumes are concentrated east of NW 87th Avenue and in the vicinity of SR 826/Palmetto Expressway for both eastbound and westbound directions. NW 12th Street corridor presents the lower heavy vehicle volumes during both the AM and PM peak hours, evenly distributed along the corridor for both directions, with higher heavy vehicle volumes next to SR 821/HEFT for the PM peak hour in the eastbound direction. In summary, there is a larger concentration of heavy vehicles next to SR 826/Palmetto Expressway than to SR 821/HEFT during peak periods.

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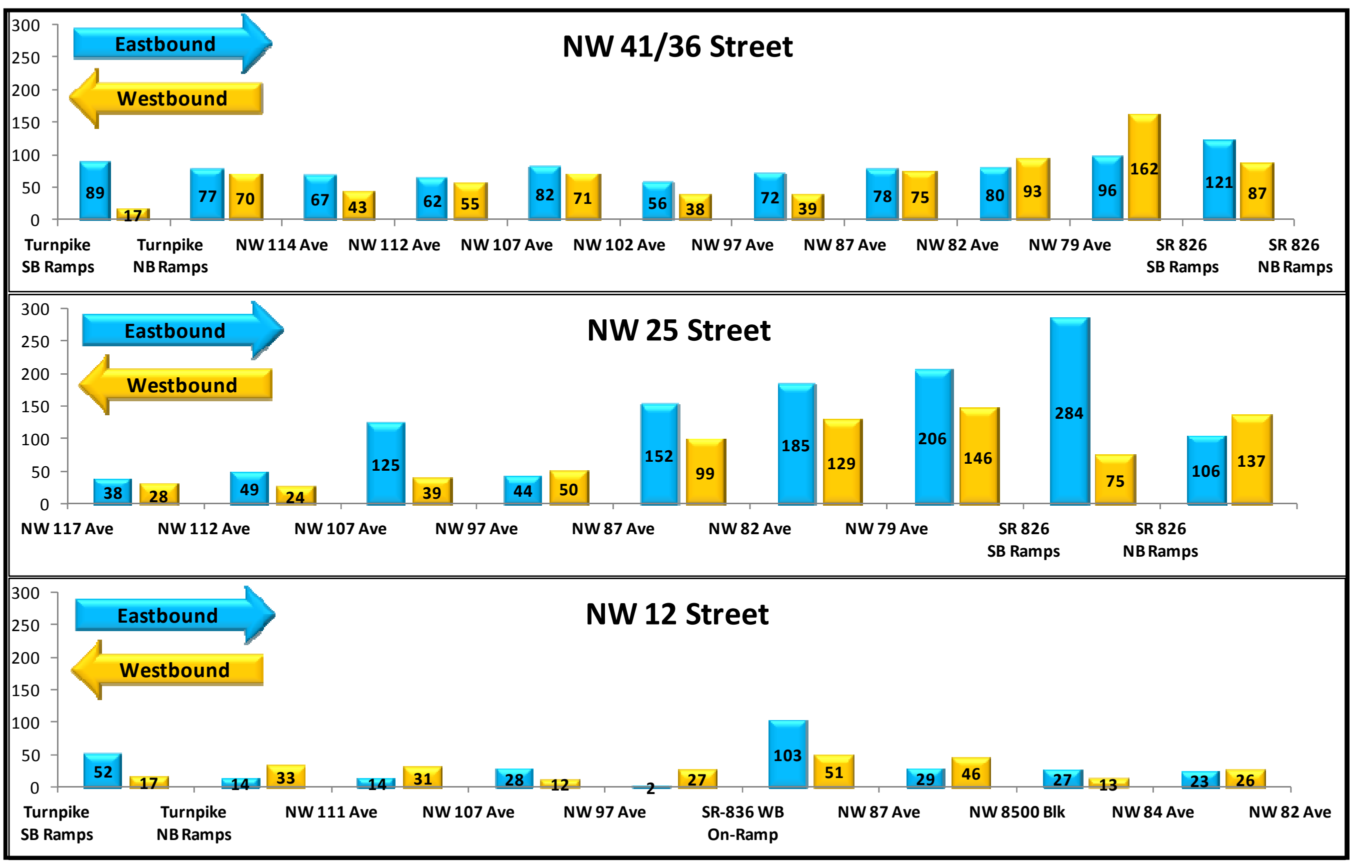


Figure 14 - AM Peak Hour Heavy Vehicles

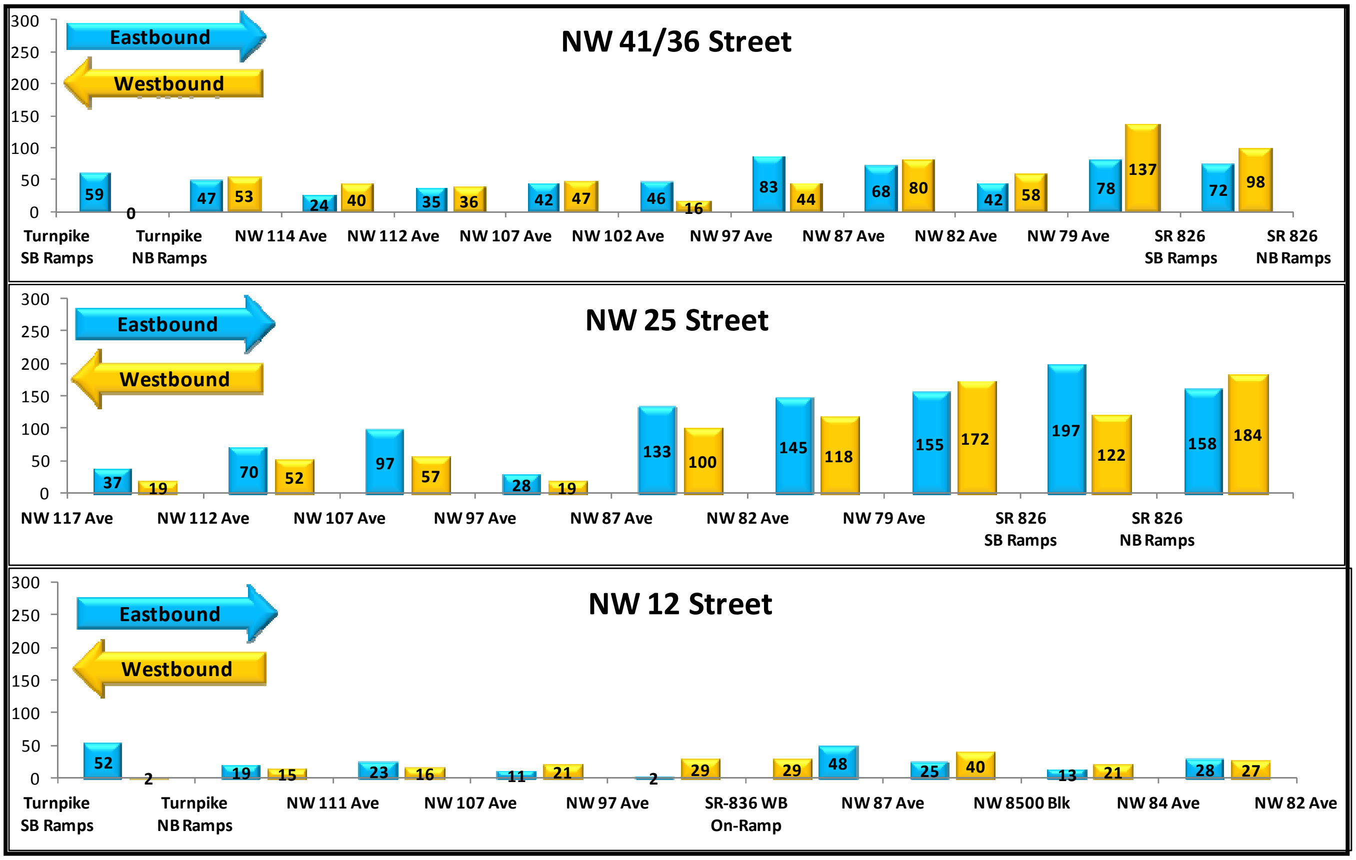


Figure 15 - PM Peak Hour Heavy Vehicles

To quantify daily traffic variation for both passenger and heavy vehicles, using data from the highest volume station for NW 36th /41st Street and NW 25th Street corridors, **Figures 16** and **17** are showing the daily variation (%) of passenger cars and (%) of heavy vehicles by time of day, calculated using the corresponding peak hour volume as a 100% reference. Along NW 25th Street corridor, percentages of passenger car volumes and heavy vehicle volumes are approximately constant during the day between AM and PM peak periods. On the other hand, along the NW 36th /41st Street corridor, percentages of passenger cars and heavy vehicle volumes are both higher during AM and PM peak periods with lower percentages for both types of vehicles during the Noon time.

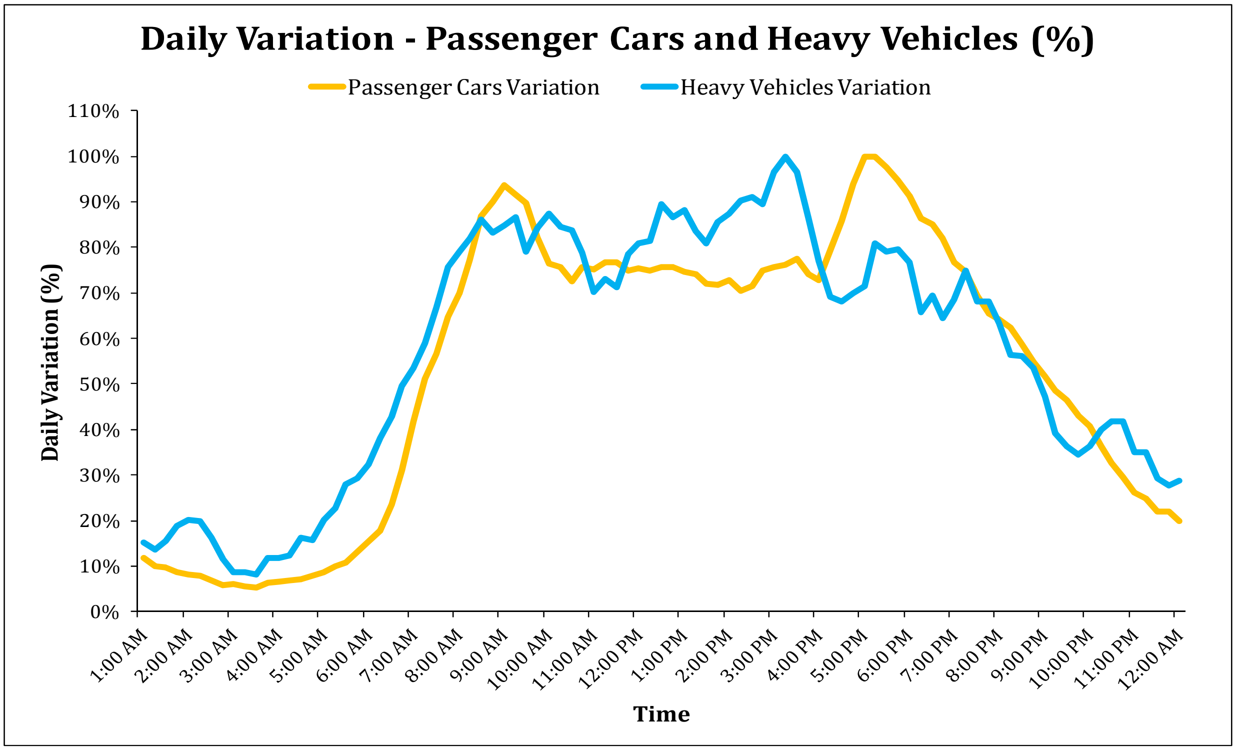


Figure 16 – Daily Traffic Variation (NW 25th Street)

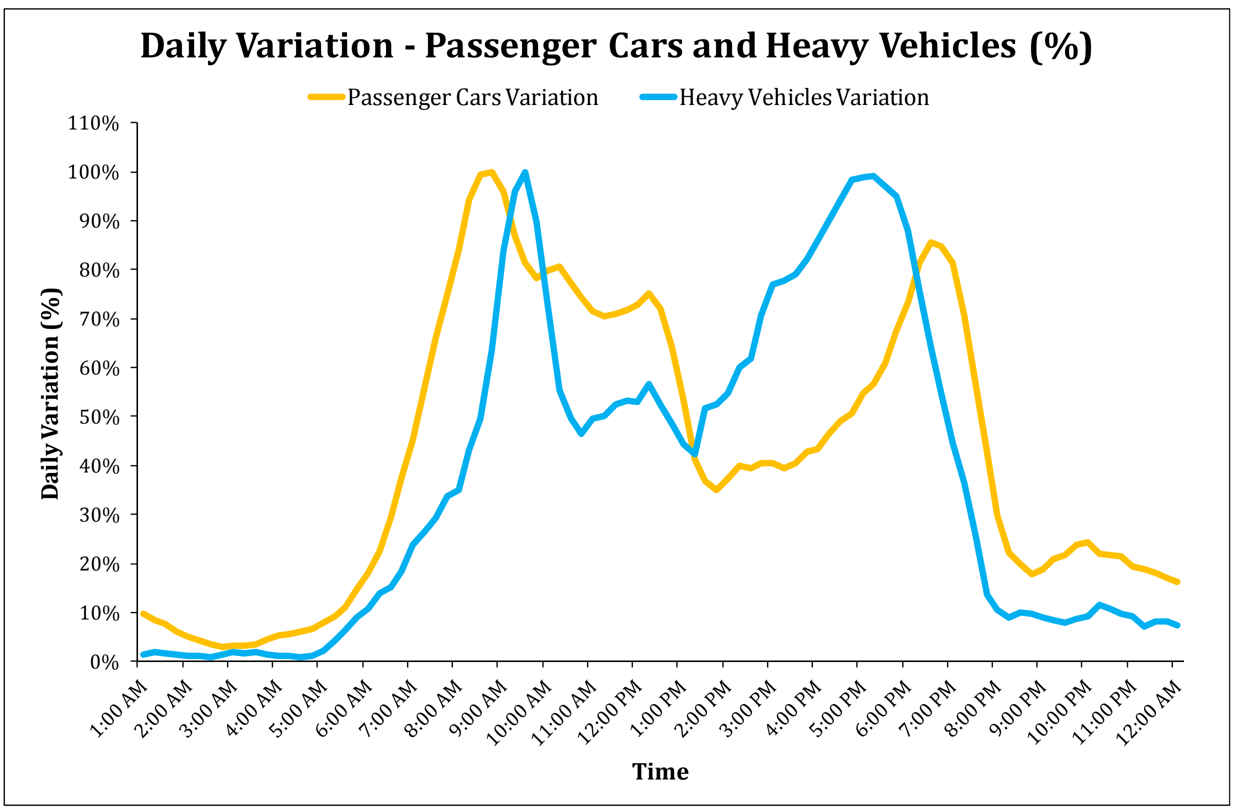
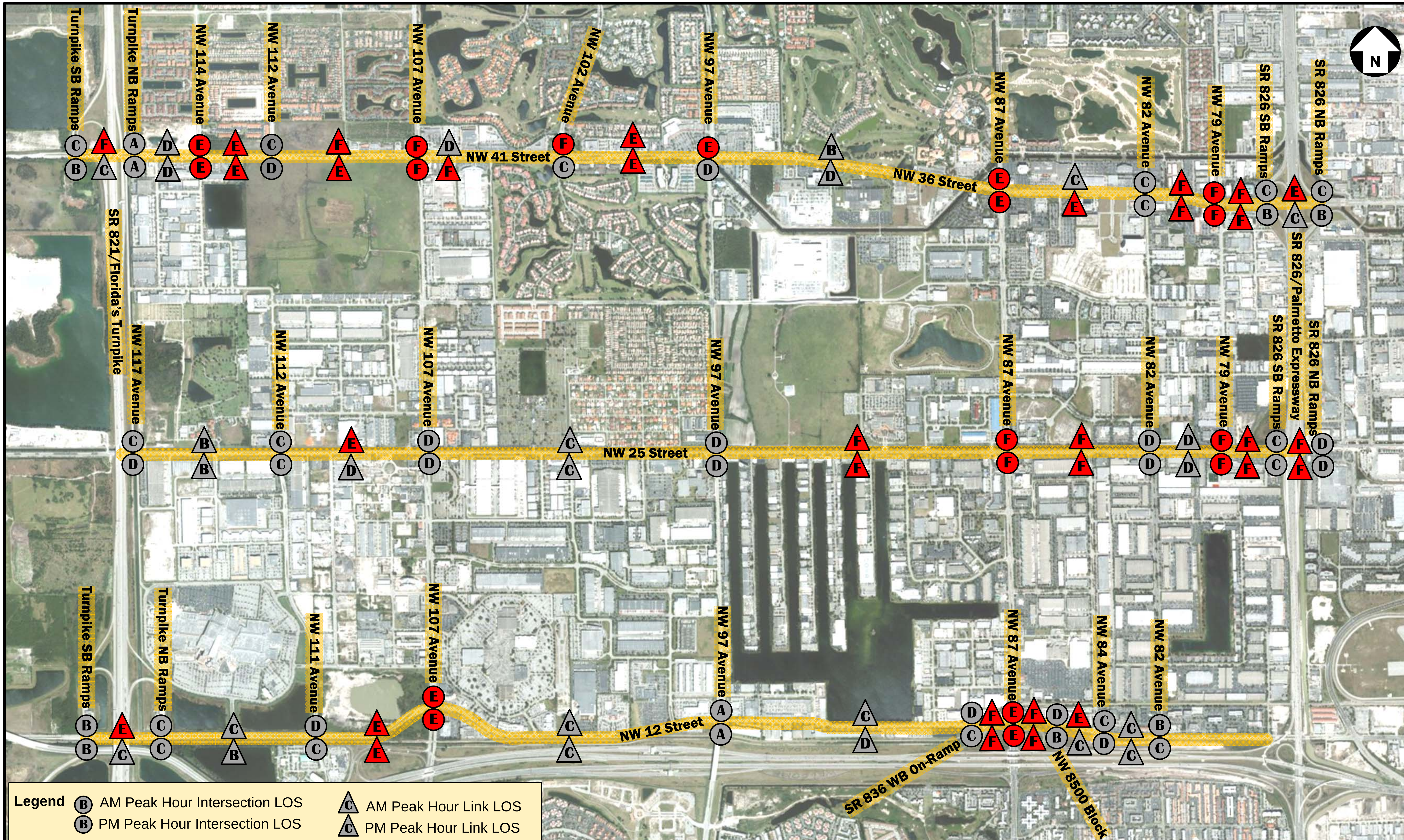


Figure 17 - Daily Traffic Variation (NW 36th Street)

5. TRAFFIC ANALYSIS EXISTING CONDITIONS

The study roadway network includes three east-west major corridors serving the Doral Warehouse District between the SR 821/HEFT on the west side and the SR 826/Palmetto Expressway on the east side of the study area. These corridors are: NW 12th Street, NW 25th Street and NW 36th/41st Street. To properly analyze the need of an alternate connection to the HEFT, traffic capacity analyses of existing roadway conditions were conducted to evaluate the current traffic operations (Year 2012) along the three corridors. Severe congestion is experienced along segments of these corridors due to the freight movement to and from the warehouses to the MIA West Cargo Area and Miami-Dade County. A summary of results of peak hour existing capacity analysis is shown in **Figure 18** where NW 36th /41st Street and NW 25th Street corridors present the worst intersection operational conditions next to SR826/Palmetto Expressway while the NW 12th Street corridor shows worst operational conditions around NW 87th Avenue. The levels of service at intersections next to SR 821/HEFT indicate better operational conditions for the three corridors. The data analysis indicated the need for reduction of congestion on NW36th Street corridor and the search for an improved connection system to HEFT. Based on this analysis, the MPO Freight Transportation Advisory Committee (FTAC) was informed about findings of the study and the beginning status of the development of potential alternatives, on June 2013. Summary of capacity analysis for each corridor are included in **Appendix D,** and synopsis reports are submitted separately in a CD digital file**.**



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Connecting 25th Street to the HEFT

Existing Level of Service (LOS)

Fig. 18

Note: Figure is not to scale.

6. CONCEPTUAL ALTERNATIVES

Six conceptual potential alternatives have been developed for evaluation in the search for a more direct access from NW 25th Street to SR 821/HEFT. Also, a reduction in truck volumes through local streets has been part of the goals of this study. The No-build alternative has been included as a basis for comparison during the alternatives selection process. The alternatives include a new signal under construction for NW 115th Avenue at NW 41st Street from plans obtained from Miami-Dade County Public Works Water Management Department, included in **Appendix E.** The alternatives also include the planned interchange modification documented in the Turnpike Design Concept Report for the SR 821/HEFT at NW 41st Street interchange, plans included in **Appendix F**. A brief description of each alternative follows.

6.1. No-Build Alternative

This alternative is defined as the "existing facility", which consists of the present physical and operational condition as previously described in Section 3. Additionally, for the alternatives analysis, some planned improvements have been added to this alternative, including the above mentioned SR 821/HEFT at NW 41st Street interchange modification and the new signal at NW 115th Avenue at NW 41st Street.

6.2. Alternative 1

This alternative provides a direct connection from NW 25th Street to the northbound SR 821/HEFT using NW 117th Avenue. NW 117th Avenue will be modified from two-lane undivided to four-lane divided and connected to the intersection of NW 41st Street at the SR 821/HEFT northbound ramps intersection. Reconstruction of this intersection will include: the northbound approach of the intersection will be modified to provide an exclusive left turn lane and an exclusive right turn lane for the SR 821/HEFT northbound off-ramp. On the northbound approach of 117th Avenue, an exclusive left turn lane, a through lane and a free flow right turn lane will be constructed. At the eastbound and westbound approaches the stop bars will be set back to provide room for the new northbound approach of NW 117th Avenue. An exclusive left turn lane will be provided at the eastbound approach of the intersection. The signal phasing and timing will be modified to accommodate the new NW 117th Avenue traffic at the intersection. A conceptual plan of this alternative is included in **Appendix G**.

6.3. Alternative 2

This alternative provides a direct connection from NW 25th Street to the northbound SR 821/HEFT using NW 117th Avenue. NW 117th Avenue will be modified from two-lane undivided to four-lane divided, underpass crossing SR 821/HEFT NB-Off ramp and extending up to the intersection of NW 41st Street at the SR 821/HEFT northbound ramps intersection. The SR 821/HEFT northbound off-ramp will be modified: the NB to EB movement from the off-ramp will bridge overpass NW 117th Avenue to maintain the right-turn free flow at the intersection; the NB to WB movement will be parallel to the existing off-ramp up to reach the intersection. The intersection of NW 41st Street at the SR 821/HEFT northbound ramps will be modified to provide an exclusive left turn lane and a free-flow right turn lane for the SR 821/HEFT northbound off-ramp approach; and one exclusive left turn lane, a through lane and a right turn lane at the northbound approach of NW 117th Avenue. Also, the stop bars will be set back at the eastbound and westbound approaches and an exclusive left turn lane will be provided at the eastbound approach of the intersection. The signal phasing and timing will be modified to accommodate the new NW 117th Avenue traffic at the intersection. A conceptual plan of this alternative is included in **Appendix G**.

6.4. Alternative 3

This alternative provides a direct connection from NW 25th Street using NW 117th Avenue to connect to the SR 821/HEFT northbound off-ramp just north of NW 34th Street intersection, and then crossing at grade the existing NW 41st Street intersection. The intersection northbound approach will be modified to include an exclusive left turn lane, a through lane and a free-flow right turn lane. Additionally, NW 117th Avenue will be widened from a two-lane undivided roadway to a four-lane divided roadway from NW 25th Street to NW 41st Street. The SW 117 Avenue southbound lanes between NW 41st Street and NW 34th Street of NW 117th Avenue will overpass the Turnpike NB off-ramp. NW 117 Avenue from NW 34th Street to the north end cul-de-sac, will be modified from two-way, two-lane, undivided to one-lane one-way northbound and a parking lane. A conceptual plan of this alternative is included in **Appendix G**.

6.5. Alternative 4

This alternative provides connection from NW 25th Street to the northbound SR 821/HEFT via NW 115th Avenue, and turning left at the NW 41st Street intersection, located just east of the SR 821/HEFT northbound on-ramp. NW 117th Avenue will be modified from two-lane undivided to four-lane divided between NW 25th Street and NW 34th Street, and remain the existing two-way, two-lane, undivided road between NW 34th Street and the north end cul-de-sac. The new traffic signal being built at NW 115th Avenue/NW 41st Street intersection would be modified by adding a second northbound left turn lane as part of this alternative, to accommodate the northbound traffic coming from the Doral Warehouse District. A conceptual plan of this alternative is included in **Appendix G**.

6.6. Alternative 5

This alternative provides a direct connection from NW 25th Street using NW 117th Avenue to connect to the SR 821/HEFT northbound off-ramp just south of NW 34th Street intersection, and then crossing at-grade the NW 41st Street intersection. NW 117th Avenue will remain a two-way, two-lane, modified to three-lanes (adding one northbound left turn) at the intersection where the new connecting ramp begins. The SR 821/HEFT northbound off-ramp will be modified from two-lane to three-lane typical section at the end of the new connecting ramp acceleration lane. The intersection of NW 117th Avenue at NW 41st St will be modified as per the improvements previously mentioned received from the Turnpike, the Design Concept Study of SR 821/HEFT at NW 41st Street Interchange. A conceptual plan of this alternative is included in **Appendix G**.

6.7. Alternative 6

This alternative provides a direct connection from NW 25th Street using NW 117th Avenue, bridge crossing over the NW 41st Street intersection and connecting to the SR 821/HEFT mainline, north of the NW 41s+t Street interchange. NW 117th Avenue will be modified from two-lane, two-way to one-lane, one-way northbound, from NW 34th Street to the north. The intersection of NW 117th Avenue at NW 41st St will be modified as per the improvements previously mentioned received from the Turnpike, the Design Concept Study of SR 821/HEFT at NW 41st Street Interchange. A conceptual plan of this alternative is included in **Appendix G**.

7. FUTURE TRAFFIC CONDITIONS

Traffic forecasting was estimated for the selected alternatives (Section 8 -Tier 1 analysis), the No-Build, 5 and 6 alternatives. The traffic forecasting was completed using FSUTMS model results for years 2017 (HEFT New Base), 2030 and 2040 provided by the Florida Turnpike Enterprise Office. Model run plots and results are presented in **Appendix H**. Following recommendations from the Turnpike Office, the FSUTMS model results were adjusted using additional information provided by them (trend volumes forecasting based on Turnpike's historical counts), and under the assumption that a new connection from NW 25th Street to HEFT would capture some of the traffic currently using the SR 826/Palmetto Expressway. An estimate of traffic attracted to this new connection and its distribution throughout the roadway network were developed for SR 821/HEFT NB ramps at NW 41st Street interchange, and are shown in **Appendix I**. **Table 1** presents the results of the NB On-ramps adjusted forecasted volumes for the No-Build, 5 and 6 alternatives, for years 2017, 2020 (interpolated), 2030 and 2040. The forecasted model volumes for HEFT NB On-Ramp were adjusted based on the Turnpike's historical and FSUTMS volumes, using a two-step process: the first adjustment factor (e.g. 1.79, 1.05 and 1.18) was calculated as the ratio of the HEFT (Historical forecasting) volume divided by the FSUTMS volume. The second adjustment factor of 1.17 was calculated as the ratio of the sum of attracted (**Appendix I)** plus existing volumes divided by the existing volume. The peak hour volumes, to be used in the capacity analysis, were estimated using a K standard value of 0.09.

Table 1 – Traffic Forecasting for No-Build, 5 and 6 Alternatives

NO-BUILD ALTERNATIVE							
	FSUTMS Base Condition			HEFT Forecast Adjusted			
Year	SB Off-Ramp (A)	NB On-Ramp (B)	Total (SB Off-Ramp & NB On-Ramp) (A) + (B)	Total Ramps (SB Off-Ramp & NB On-Ramp) (C)	HEFT/FSUTMS Ratio[1] D = (C) /(A+B)	NB On-Ramp[2] (B)*(D)	SB Off-Ramp [2] (A)*(D)
2017	3780	4804	8584	15400	1.79	8619	6781
2020	-	-	-	-	-	9342	-
2030	8440	11212	19652	20600	1.05	11753	8847
2040	8381	13177	21558	25400	1.18	15525	9875

ALTERNATIVE 5							
Year	(FSUTMS) NB On-Ramp (A)	HEFT/FSUTMS Ratio[1] (B)	Adjusted NB On-Ramp[1][2] (A)*(B)	Trips Attraction Adjustment Factor[3] (C)	Adjusted NB On-Ramp (A)*(B)*(C)	NB On-Ramp Attracted Volume (Alt. 5)[4] (D)	NB On-Ramp Attracted Peak Hour Traffic [5] (D) * K
2017	4526	1.79	8120	1.17	9481	862	78
2020	-	-	-		10439	1097	99
2030	11140	1.05	11677		13634	1881	169
2040	13257	1.18	15620		18237	2712	244

ALTERNATIVE 6											
Year	FSUTMS NB On-Ramp at Intersection (A)	FSUTMS Bridge Volumes (B)	HEFT/FSUTMS Ratio[1] (C)	Adjusted NB On-Ramp at Intersection[1][2] (A)* (C)	Adjusted Bridge Volumes[1] (B) * (C)	Trip Distribution Adjustment Factor [3] (D)	Adjusted NB On-Ramp at Intersection (E)= (A*C*D)	Adjusted Bridge Volumes (F)= (B*C*D)	Total Adjusted NB On-Ramp[1] (E)+(F)	NB On-Ramp Attracted Volumes (Alt. 6)[4] (G)	NB On-Ramp Attracted Peak Hour Traffic (G) * K
2017	3898	848	1.79	6993	1521	1.17	8165	1776	9941	1323	119
2020			-	7843	1554		9157	1814	10971	1629	147
2030	10184	1099	1.05	10675	1152		12464	1345	13809	2056	185
2040	12049	1503	1.18	14196	1771		16575	2068	18643	3118	281

(1) HEFT/FSUTMS Ratio: calculated ramps traffic distribution factor.
(2) Calculated volumes using HEFT/FSUTMS Ratio times FSUTMS (SB Off or NB Off) volume
(3) Adjustment factor based on estimated attracted trips to NB on Ramp
(4) Attracted Volume: NB On Ramp Volume (Alt 5 or 6) – NB On Ramp Volume (No Build)
(5) K factor: FDOT Standard (K = 0.09) used for peak hour volumes calculation

For the highest peak hour (PM), a refined traffic analysis was conducted using Synchro 7 for the design year 2040 for the No-Build, 5 and 6 alternatives, resulting in a need for additional improvements along NW 36th/41st Street at local congested intersections near HEFT. In a second refined traffic analysis, Alternatives 5 and 6 were modified into Alternatives 5A and 6A to include the proposed intersection improvements and the results of this second traffic analysis are shown in **Tables 2, 3 and 4**. The last column in tables 3 and 4 include brief descriptions of the proposed intersection improvements. The results have been calculated using the 2000 Highway Capacity Manual methodology and the Measures of Effectiveness: Intersection levels of service and the approach delay per vehicle for each lane group. Detailed results of 2040 Capacity Analyses are included in **Appendix J.** Also, total delay for each alternative along the NW 36$^{/41}$ Street between NW 97 Ave and SR 821/ HEFT is included in these tables. Both Alternatives 5A and 6A resulted in significant savings in delay hours with respect to the No-Build alternative, during the highest peak hour. Detailed results of the 2040 Total Delay Analysis are presented in **Appendix K.** In addition, for the Alternative 5A - merging with SR 821/HEFT NB-Off-ramp, a weaving and queue analyses were performed for the 2040 design year highest peak hour (AM). Results of these analyses are both acceptable: weaving level of service (B) and queue length of 900 ft. for northbound approach at the NW 41st Street intersection. Detailed results of these analyses are included in **Appendix L.**

TABLE 2 - 2040 Traffic Capacity Analysis for No-Build Alternative

NW 36/41 Street between NW 97 Avenue and SR 821/HEFT

Intersection	Delay/ LOS	Eastbound			Westbound			Northbound			Southbound			Intersection
		L	T	R	L	T	R	L	T	R	L	T	R	
Trnpk SB Ramps	Delay (s)		7.8			7.4					19.4		0.0	16.9
	LOS		A			A					B		A	B
Trnpk NB Ramps	Delay (s)	11.9	2.4			13.3	276.4	72.4		130.8				126.4
	LOS	B	A			B	F	E		F				F
NW 115 Avenue	Delay (s)	107.7	39.4		170.0	229.2		79.1	63.8		63.7	61.1		152.1
	LOS	F	D		F	F		E	E		E	E		F
NW 114 Avenue	Delay (s)	284.8	24.1		558.8	126.5		325.1	394.3		335.1	496.0	794.6	242.0
	LOS	F	C		F	F		F	F		F	F	F	F
NW 112 Avenue	Delay (s)	470.3	13.9			243.1					29.2		28.7	214.9
	LOS	F	B			F					C		C	F
NW 107 Avenue	Delay (s)	119.2	99.7		411.5	469.5		393.8	360.9	71.9	59.4	334.9		325.7
	LOS	F	F		F	F		F	F	E	E	F		F
NW 102 Avenue	Delay (s)	437.2	31.5		106.3	220.8			70.2	59.2	69.4	48.3	44.2	152.5
	LOS	F	C		F	F			E	E	E	D	D	F
NW 97 Avenue	Delay (s)	69.5	153.5		352.6	408.0		147.1	142.6		78.3	61.6		228.2
	LOS	E	F		F	F		F	F		E	E		F

Total Network Delay	13784.6 hrs	Delay Savings: 0 hr

TABLE 3 - 2040 Traffic Capacity Analysis for Alternative 5A

NW 36/41 Street between NW 97 Avenue and SR 821/HEFT

Intersection	Delay/ LOS	Eastbound			Westbound			Northbound			Southbound			Intersection	Improvement
		L	T	R	L	T	R	L	T	R	L	T	R		
Trnpk SB Ramps	Delay (s)		7.7			7.3					19.7		0.0	17.1	None
	LOS		A			A					B		A	B	
Trnpk NB Ramps	Delay (s)	22.7	8.9			16.9	165.3		30.0	29.4				66.9	Connection to NB HEFT provided from NW 117 Avenue at the intersection (NBT Lane)
	LOS	C	A			B	F		C	C				E	
NW 115 Avenue	Delay (s)	118.1	40.9	44.6	30.3	12.7	1.3	68.5	131.0		155.0	77.1		37	Add a NBL, EBL, EBR, WBL and WBR Turn Lanes, Modify Signal Timing (NB/SB Split Phase)
	LOS	F	D	D	C	B	A	E	F		F	E		D	
NW 114 Avenue	Delay (s)	281.6	23.4		73.2	178.6		264.9	183.6		222.4	142.0	294.0	156.1	Add a WBL Turn Lane, Modify Signal Timing (WBL Protected Only)
	LOS	F	C		E	F		F	F		F	F	F	F	
NW 112 Avenue	Delay (s)	167.7	5.9			167.5					37.8		36.5	136.3	Add a EBL Turn Lane, Modify Signal Timing (EBL Protected Only)
	LOS	F	A			F					D		C	F	
NW 107 Avenue	Delay (s)	187.5	55.6		158.8	188.8		231.1	72.5	141.2	101.0	254.7		157.2	Add a NBL, SBL, EBL Turn Lanes, Modify Signal Timing (Eliminate NB/SB Split Phase and NBL, SBL, EBL Protected Only)
	LOS	F	E		F	F		F	E	F	F	F		F	
NW 102 Avenue	Delay (s)	177.5	5.7		82.2	66.6			262.8	69.9	74.9	67.0	61.3	57.4	Add EBL and WBL Turn Lanes, Modify Signal Timing (EBL and WBL Protected Only)
	LOS	F	A		F	E			F	E	E	E	E	E	
NW 97 Avenue	Delay (s)	187.0	79.3		98.3	51.3	6.4	151.1	92.4	49.4	135.0	136.4		86.6	Add WBR and NBR Turn Lanes, Modify Signal Timing (Optimize Splits)
	LOS	F	E		F	D	A	F	F	D	F	F		F	

Total Network Delay (Alternative 5A)	11723.1 hrs	Delay Savings over No-Build: 2061.5 hr

TABLE 4 - 2040 Traffic Capacity Analysis for Alternative 6A

NW 36/41 Street between NW 97 Avenue and SR 821/HEFT

Intersection	Delay/ LOS	Eastbound			Westbound			Northbound			Southbound			Intersection	Improvement
		L	T	R	L	T	R	L	T	R	L	T	R		
Trnpk SB Ramps	Delay (s)		7.7			7.3					19.7		0.0	17.1	None
	LOS		A			A					B		A	B	
Trnpk NB Ramps	Delay (s)	21.8	8.4			15.7	154.3	23.1		30.5				63.8	Bridge connection to NB HEFT provided from NW 117 Avenue at NW 41 Street intersection
	LOS	C	A			B	F	C		C				E	
NW 115 Avenue	Delay (s)	119.1	41.3	43.9	30.9	12.2	1.3	66.6	118.3		147.8	77.0		36.1	Add a NBL, EBL, EBR, WBL and WBR Turn Lanes, Modify Signal Timing (NB/SB Split Phase)
	LOS	F	D	D	C	B	A	E	F		F	E		D	
NW 114 Avenue	Delay (s)	281.0	22.9		73.2	174.0		250.2	183.6		222.4	142.0	293.0	153.3	Add a WBL Turn Lane, Modify Signal Timing (WBL Protected Only)
	LOS	F	C		E	F		F	F		F	F	F	F	
NW 112 Avenue	Delay (s)	167.7	5.9			163.6					37.8		36.5	133.5	Add a EBL Turn Lane, Modify Signal Timing (EBL Protected Only)
	LOS	F	A			F					D		D	F	
NW 107 Avenue	Delay (s)	188.4	50.2		201.0	197.1		219.2	69.6	141.2	95.3	237.9		158.7	Add a NBL, SBL, EBL Turn Lanes, Modify Signal Timing (Eliminate NB/SB Split Phase and NBL, SBL, EBL Protected Only)
	LOS	F	D		F	F		F	E	F	F	F		F	
NW 102 Avenue	Delay (s)	178.5	5.6		92.9	63.1			262.8	69.9	74.9	67.0	61.3	55.9	Add EBL and WBL Turn Lanes, Modify Signal Timing (EBL and WBL Protected Only)
	LOS	F	A		F	E			F	E	E	E	E	E	
NW 97 Avenue	Delay (s)	157.4	106.9		92.8	66.7	7.2	143.1	85.8	48.4	135.0	125.7		92.5	Add WBR and NBR Turn Lanes, Modify Signal Timing (Optimize Splits)
	LOS	F	F		F	E	A	F	F	D	F	F		F	

Total Network Delay (Alternative 6A)	10951.2	Delay Savings over No-Build: 2833.6 hr

8. EVALUATION OF ALTERNATIVES

The evaluation of the developed concept alternatives was conducted in two tiers. Tier 1 analysis included the No-Build and Alternatives 1 through 6. The evaluation criteria included impacts related to cost, engineering impacts such as: capacity improvements, SW 117 widening, HEFT-off-ramp relocation, new bridges, right-of-way, toll facility relocation; and environmental/socio-economic impacts such as: Air quality, noise, construction impacts, community cohesion, and visual and aesthetics. **Table 5** presents the evaluation, using low (1 point), medium (2 points) and high (3 points) for impact measurement, and the ranking results of the study alternatives. The first three ranked alternatives (No-Build, Alternatives 5 and 6) were selected for the next step, the Tier 2 alternatives analysis. Before the Tier 2 analysis, the selected alternatives 5 and 6 were modified by adding local intersections improvement along NW 36th /41st Street corridor near the HEFT interchange. These intersection improvements originated Alternatives 5A and 6A as previously described in Section 7. The following are advantages and disadvantages of each modified alternative.

Advantages	Disadvantages
<u>No-Build Alternative</u> • No cost • No right of way impacts	• Increased congestion • Decreased air quality • No direct connection from NW 25th Street to HEFT
<u>Alternative 5A</u> • Medium cost • Connecting NW 25th Street to HEFT • Improved capacity on roadway network • Maintains community cohesion	• Relocation of toll facility • Impact on HEFT right-of-way • Additional weaving on HEFT NB Off-ramp
<u>Alternative 6A</u> • Connecting NW 25th Street to HEFT • Improved capacity of roadway network • No impact on HEFT NB Off	• High cost • High construction impacts on NW 117 Avenue • High visual and aesthetics impact

Table 5 - Tier 1 Analysis (Evaluation of Alternatives)

ITEMS		ALTERNATIVES													
		NO-BUILD		1		2		3		4		5		6	
	COST	No	1	Medium	2	High	3	High	3	Medium	2	Medium	2	High	3
ENGINEERING	Capacity Improvements	no	3	No	3	No	3	No	3	No	3	Yes	1	Yes	1
ENGINEERING	SW 117 Ave Widening	No	1	2- Way, 4- Lanes	3	2- Way, 4- Lanes	3	2- Way, 4- Lanes	3	2- Way, 4- Lanes	3	One-Way NB	1	One-Way NB	1
ENGINEERING	HEFT NB Off-Ramp Relocation	No	1	Low	1	High	3	Medium	2	No	1	No	1	No	1
ENGINEERING	Bridge Construction	No	1	No	1	Yes	3	Yes	3	No	1	No	1	Yes	3
ENGINEERING	Right-of-Way Impact	No	1	SE Corner	2	SE Corner	2	HEFT	3	HEFT	3	HEFT	3	Cul de Sac	2
ENGINEERING	Toll Facility Relocation	No	1	yes	3	Yes	3	Yes	3	No	1	Yes	3	No	1
ENVIRONMENTAL & SOCIO-ECONOMICS	Air Quality Impact	High	3	High	3	Low	1	High	3	High	3	Low	1	Medium	2
ENVIRONMENTAL & SOCIO-ECONOMICS	Noise Impact	Low	1	High	3	Medium	2	Medium	2	High	3	Low	1	Medium	2
ENVIRONMENTAL & SOCIO-ECONOMICS	Construction Impacts	No	1	Medium	2	High	3	High	3	High	3	Medium	2	High	3
ENVIRONMENTAL & SOCIO-ECONOMICS	Community Cohesion Impact	No	1	Medium	2	Low	1	Low	1	High	3	Low	1	High	3
ENVIRONMENTAL & SOCIO-ECONOMICS	Visual Impacts & Aesthetics	Low	1	Medium	2	High	3	High	3	Medium	2	Low	1	High	3
Evaluation Points		16		27		30		32		28		18		25	
Ranking		1		4		6		7		5		2		3	
Impact Rating			1	***LOW***	2	***MEDIUM***	3	***HIGH***							

9. COST ESTIMATES AND BENEFIT-COST ANALYSIS

COST ESTIMATES

The estimate of conceptual construction costs for each alternative was based on 2012 unit costs from the Florida Department of Transportation (FDOT) Construction Cost History book for Miami-Dade County area. Details of cost estimates are included in **Appendix M**. A summary of cost estimates for Alternatives 5, 5A, 6, and 6A follow.

<u>Alternatives 5 and 5A</u>

Alternative 5:	$2,950,000
Intersection Improvements:	$1,710,000
Alternative 5A:	$4,660,000

<u>Alternatives 6 and 6A</u>

Alternative 6:	$5,160,000
Intersection Improvements:	$1,710,000
Alternative 6A:	$6,870,000

BENEFIT/COST ANALYSIS

An annualized Benefit/Cost (B/C) analysis was performed for Alternatives 5A and 6A to determine the cost effectiveness of the improvements over the No-Build Alternative. The estimation of the benefits was based on operational benefits (delay savings) by calculating and comparing Total Network Delay (hours) performance for each alternative (including the No-Build), in year 2040, for the NW 36th/41st Street corridor between the HEFT and Palmetto Expressway. The Total Delay for the corridor was obtained from three micro-simulation runs in SimTraffic for the PM peak hour; results from the micro-simulation runs for the No-Build, 5A and 6A alternatives are included in **Appendix K**. The estimation of benefits for Alternative 5A and 6A with respect to the No-Build alternative resulted in 7,469.2 and 10,265.9 hours of daily saving hours, respectively. **Tables 6** and **7** present a summary of the Annual Total Dollar Delay Saving calculations for Alternatives 5A and 6A.

Table 6 – Alternative 5A Operational Benefit Calculations

Time of Day	No-Build	Alternative 5A	Diff Hourly Delay Savings	(1)Daily Delay Savings	(2)Annual Total Delay Savings
	Delay (veh-hr)	Delay (veh-hr)	Delay(veh-hour)	(veh-hours)	(veh-hours)
PM Peak	13784.6	11723.1	2061.5	7469.2	1,949,461
Daily Factor: Use 3 times for Peak Period to Daily Delay=			27.60%(1)	**Annual Total Dollar Delay Saving(3) =**	**$31,191,379**
Peak to Daily=			9.20%		

Table 7 – Alternative 6A Operational Benefit Calculations

Time of Day	No-Build	Alternative 6A	Diff Hourly Delay Savings	(1)Daily Delay Savings	(2)Annual Total Delay Savings
	Delay (veh-hr)	Delay (veh-hr)	Delay(veh-hour)	(veh-hours)	(veh-hours)
PM Peak	13784.6	10951.2	2833.4	10265.9	2,679,400
Daily Factor: Use 3 times for Peak Period to Daily Delay=			27.60%(1)	**Annual Total Dollar Delay Saving(3) =**	**$42,870,398**
Peak to Daily=			9.20%		

(1) Daily Delay Savings are calculated by dividing PM Diff Delay Savings by the daily factor shown above

(2) Annual Total Delay is calculated by multiplying Daily Delay by Travel Days per Year, Travel Days per Year=261

(3) Annual Total Dollar Delay Saving is calculated by multiplying Daily Delay Savings by the Cost of Time (Dollars/veh-hour), obtained from the 2012 Urban Mobility Report prepared by the Texas A&M Transportation Institute.

An interest rate of 4%, time cost of $16 per hour of delay and 20-year period of analysis were used to calculate the B/C for the proposed alternatives. The estimated unit costs were taken from the latest FDOT Construction Cost History Book for Miami-Dade County. Results of the Benefit-Cost analysis for each alternative are shown in **Table 8**. Alternative 5A resulted with the highest B/C ratio of 69.1.

Table 8 – Benefit-Cost Analysis

Alt	2013 Cost	F/P (4%,7)	2020 Cost	A/P (4%,20)	Annualized Cost	Annualized Benefit	Annualized B/C
5A	$4,660,000	1.316	$6,132,560	0.0736	**$451,356**	**$31,191,379**	69.1
6A	$6,870,000		$9,040,920		**$665,412**	**$42,870,398**	64.4

10. RECOMMENDED ALTERNATIVE SELECTION

For selecting the recommended alternative, the advantages and disadvantages of the three alternatives were considered in conjunction with a Tier 2 evaluation analysis of cost estimate and benefit-cost. Tier 2 analysis is shown in **Table 9**.

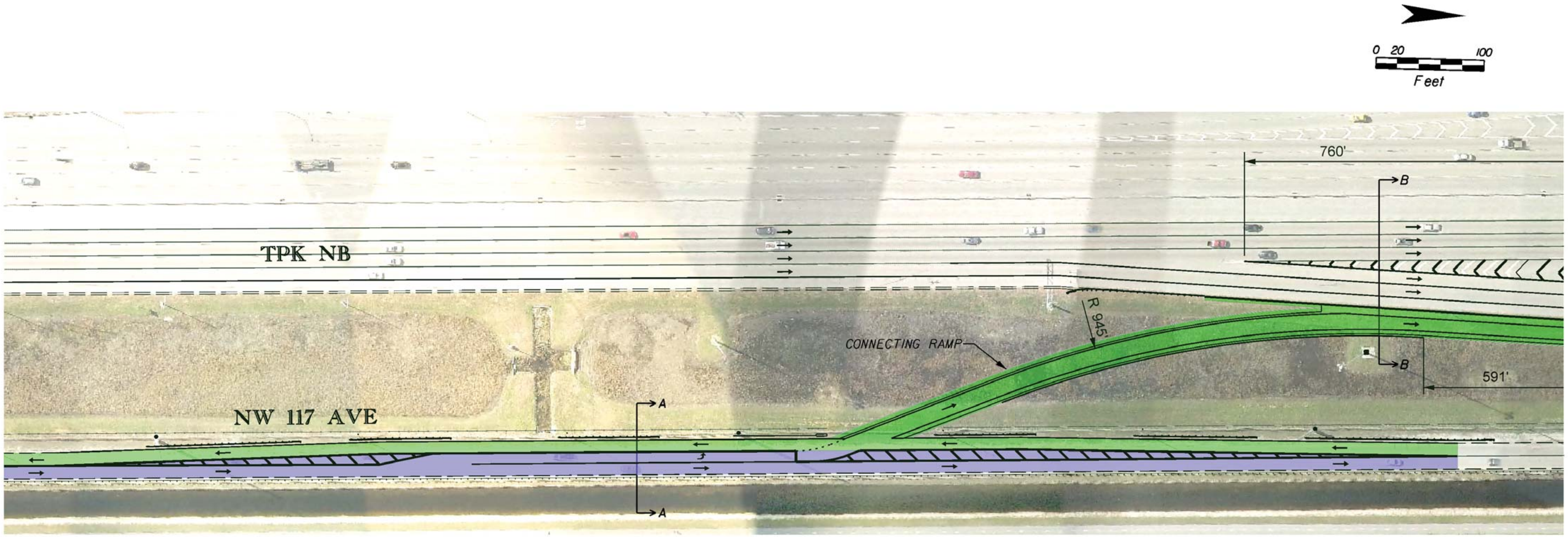
Table 9 – Tier 2 Analysis (Evaluation of Alternatives)

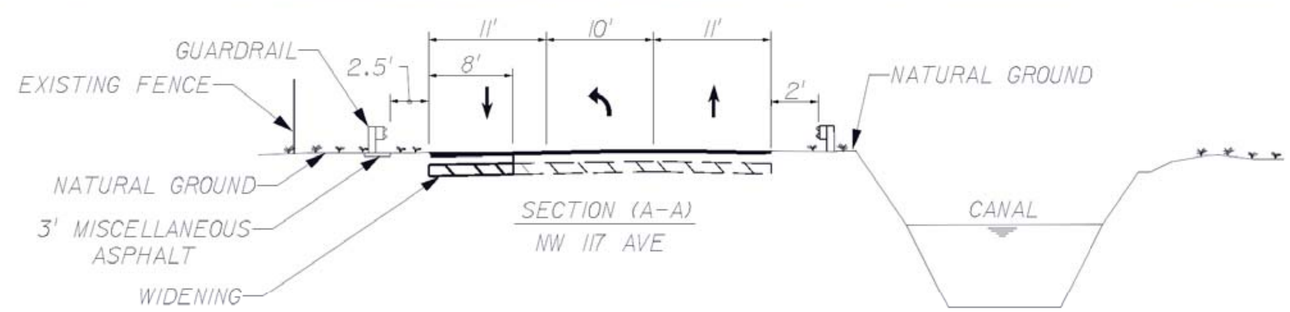
	No-Build	Alternative 5A	Alternative 6A
Cost	0	$4,660,000	$6,870,000
Benefit/Cost	0	69.1	64.4
Ranking	3	1	2

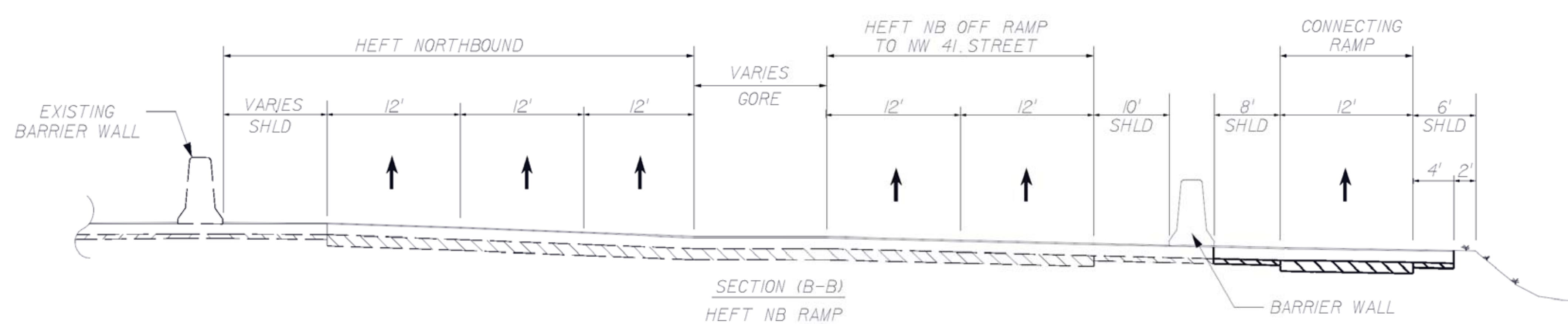
Based on the study analysis, the following are recommendations from this study:

- Alternative 5A (**Figure 19**) with lower cost and higher benefit-cost ratio is selected and recommended as "preferred alternative" to be included in the Florida Turnpike Enterprise Design Concept Report for HEFT/NW 41st Street Interchange or in a separate PD&E study.

- In addition, the below improvements are recommended at the following intersections along NW 36th /41st Street corridor:
    1. HEFT NB Ramps: Improvements presented in the Turnpike Design Concept Report for HEFT at NW 41st Street Interchange.
    2. NW 115th Avenue: Add northbound left, eastbound left, eastbound right, westbound left and westbound turn lanes. Modify signal timing and phasing (Northbound/southbound split phase).
    3. NW 114th Avenue: Add westbound left turn lane, modify signal timing and phasing (Westbound left protected only).
    4. NW 112th Avenue: Add eastbound left turn lane, modify signal timing and phasing (Eastbound left protected only).
    5. NW 107th Avenue: Add northbound left, southbound left and eastbound left turn lanes. Modify signal timing and phasing (Eliminate northbound/southbound split phase and provide protected only for northbound, southbound and eastbound left movements).
    6. NW 102nd Avenue: Add eastbound left and westbound left turn lanes. Modify signal timing and phasing (Eastbound left and westbound left protected only).
    7. NW 97th Avenue: Add westbound right and northbound right turn lanes. Modify signal timing and phasing (Optimize splits).
- A more detailed capacity analysis is recommended to be included in the Design Concept Report and/or PD&E process.





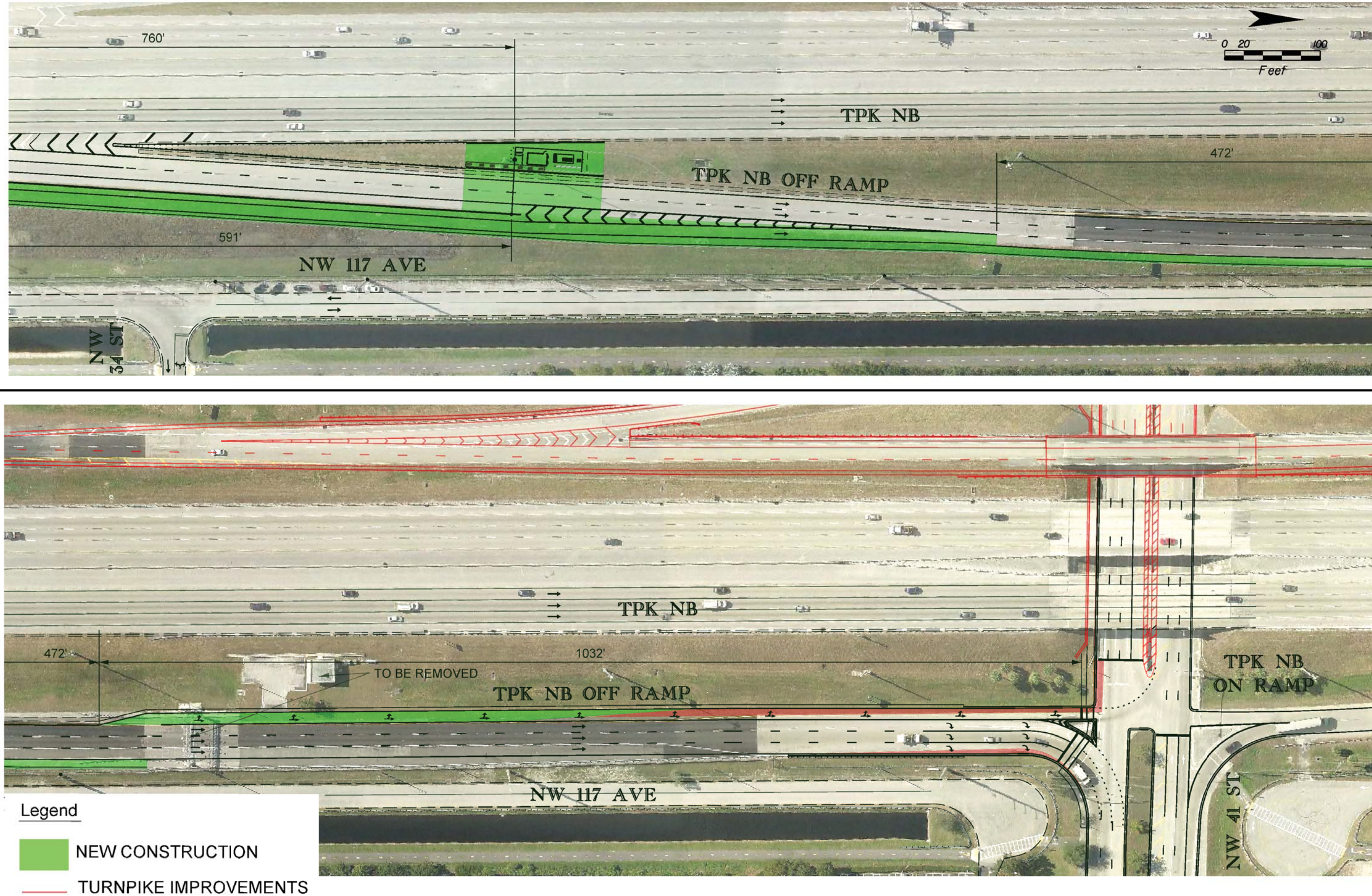


Legend

NEW CONSTRUCTION

MILLING & RESURFACING

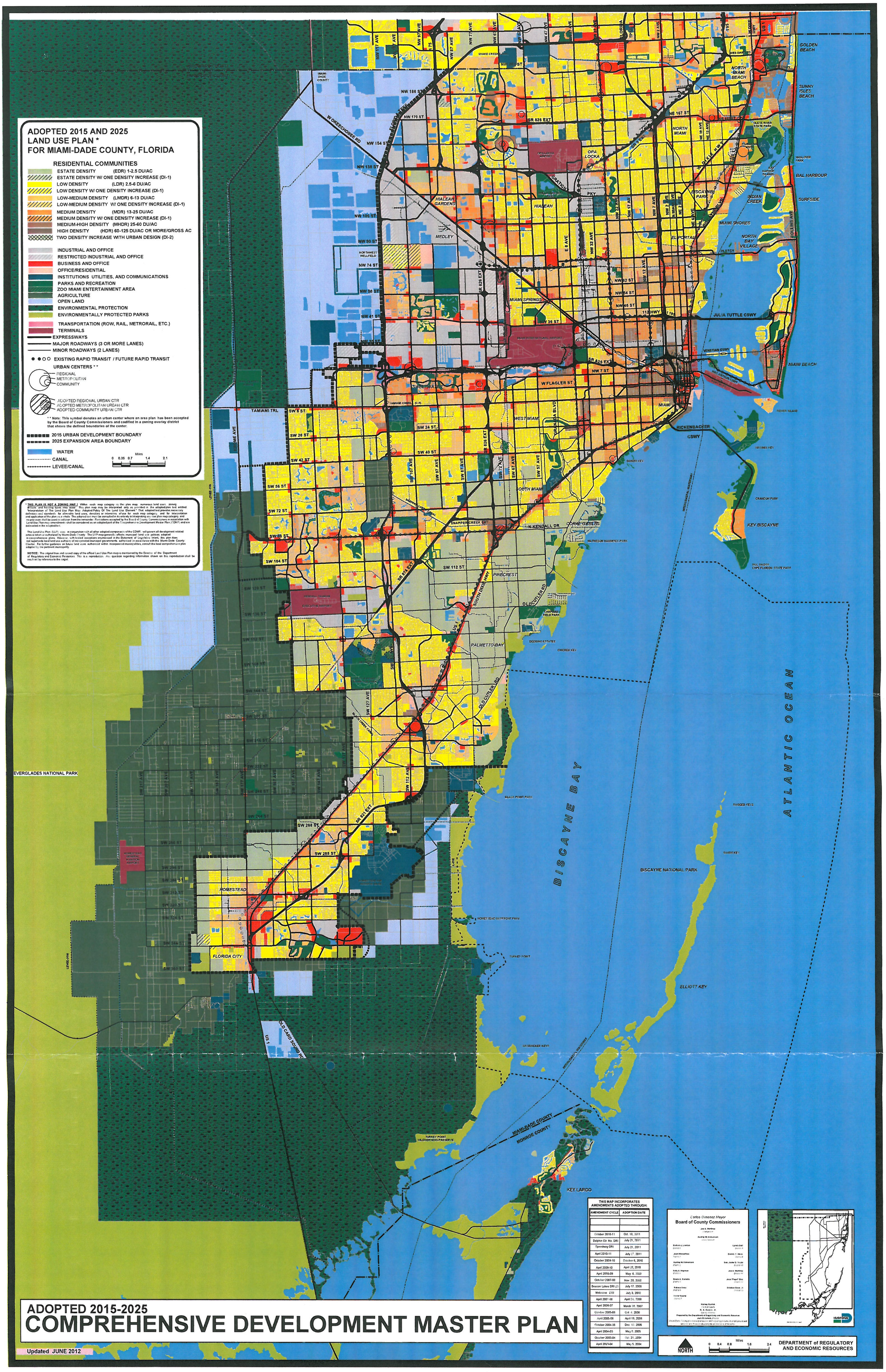
Miami-Dade Metropolitan Planning Organization	MARLIN ENGINEERING	CONNECTING NW 25th STREET TO THE HEFT STUDY	RECOMMENDED ALTERNATIVE	Fig 19 (1 of 2)



Miami-Dade Metropolitan Planning Organization | MARLIN ENGINEERING | CONNECTING NW 25th STREET TO THE HEFT STUDY | RECOMMENDED ALTERNATIVE | Fig 19 (2 of 2)

Appendix A

Land Use


ADOPTED 2015 AND 2025
LAND USE PLAN *
FOR MIAMI-DADE COUNTY, FLORIDA
RESIDENTIAL COMMUNITIES
ESTATE DENSITY (EDR) 1-2.5 DU/AC
ESTATE DENSITY W/ ONE DENSITY INCREASE (DI-1)
LOW DENSITY (LDR) 2.5-6 DU/AC
LOW DENSITY W/ ONE DENSITY INCREASE (DI-1)
LOW-MEDIUM DENSITY (LMDR) 6-13 DU/AC
LOW-MEDIUM DENSITY W/ ONE DENSITY INCREASE (DI-1)
MEDIUM DENSITY (MDR) 13-25 DU/AC
MEDIUM DENSITY W/ ONE DENSITY INCREASE (DI-1)
MEDIUM-HIGH DENSITY (MHDR) 25-60 DU/AC
HIGH DENSITY (HDR) 60-125 DU/AC OR MORE/GROSS AC
TWO DENSITY INCREASE WITH URBAN DESIGN (DI-2)
INDUSTRIAL AND OFFICE
RESTRICTED INDUSTRIAL AND OFFICE
BUSINESS AND OFFICE
OFFICE/RESIDENTIAL
INSTITUTIONS UTILITIES, AND COMMUNICATIONS
PARKS AND RECREATION
ZOO MIAMI ENTERTAINMENT AREA
AGRICULTURE
OPEN LAND
ENVIRONMENTAL PROTECTION
ENVIRONMENTALLY PROTECTED PARKS
TRANSPORTATION (ROW, RAIL, METRORAIL, ETC.)
TERMINALS
EXPRESSWAYS
MAJOR ROADWAYS (3 OR MORE LANES)
MINOR ROADWAYS (2 LANES)
EXISTING RAPID TRANSIT / FUTURE RAPID TRANSIT
URBAN CENTERS **
REGIONAL
METROPOLITAN
COMMUNITY
ADOPTED REGIONAL URBAN CTR
ADOPTED METROPOLITAN URBAN CTR
ADOPTED COMMUNITY URBAN CTR
** Note: This symbol denotes an urban center where an area plan has been accepted by the Board of County Commissioners and codified in a zoning overlay district that shows the defined boundaries of the center.
2015 URBAN DEVELOPMENT BOUNDARY
2025 EXPANSION AREA BOUNDARY
WATER
CANAL
LEVEE/CANAL
Miles
0 0.35 0.7 1.4 2.1
EVERGLADES NATIONAL PARK
BISCAYNE BAY
ATLANTIC OCEAN
BISCAYNE NATIONAL PARK
KEY BISCAYNE
ELLIOTT KEY
KEY LARGO
MIAMI
MIAMI BEACH
HIALEAH
HOMESTEAD
FLORIDA CITY
PALMETTO BAY
PINECREST
SOUTH MIAMI
WEST MIAMI
CORAL GABLES
MIAMI SPRINGS
MEDLEY
OPA LOCKA
NORTH MIAMI
NORTH MIAMI BEACH
GOLDEN BEACH
SUNNY ISLES BEACH
BAL HARBOUR
SURFSIDE
MIAMI SHORES
EL PORTAL
BISCAYNE PARK
HIALEAH GARDENS
TAMIAMI TRL
RICKENBACKER CSWY
JULIA TUTTLE CSWY
MIAMI-DADE COUNTY
MONROE COUNTY
THIS MAP INCORPORATES AMENDMENTS ADOPTED THROUGH:
AMENDMENT CYCLE
ADOPTION DATE
Dolphin Ctr. No. DRI July 21, 2011
Speedway DRI July 21, 2011
April 2010-11
October 2009-10
April 2009-10
April 2008-09
Beacon Lakes DRI July 17, 2008
April 2005-06 April 19, 2006
April 2004-05
April 2003-04 May 5, 2004
Board of County Commissioners
NORTH
Miles
0 0.4 0.8 1.6 2.4
DEPARTMENT of REGULATORY AND ECONOMIC RESOURCES
ADOPTED 2015-2025
COMPREHENSIVE DEVELOPMENT MASTER PLAN
Updated JUNE 2012

Appendix B

Historical Counts

Florida Department of Transportation
Transportation Statistics Office
2010 Historical AADT Report

County: 97 - FL. TURNPIKE

Site: 0292 - HEFT NB ON RAMP FROM NW 41ST ST M29B

Year	AADT	Direction 1	Direction 2	K Factor	D Factor	T Factor
2010	8600 C	N 8600	0	10.77	99.99	5.70

AADT Flags: C = Computed; E = Manual Estimate; F = First Year Estimate
S = Second Year Estimate; T = Third Year Estimate; X = Unknown

Florida Department of Transportation
Transportation Statistics Office
2010 Historical AADT Report

County: 97 - FL. TURNPIKE

Site: 0293 - HEFT SB OFF RAMP TO NW 41ST ST M29C

Year	AADT	Direction 1	Direction 2	K Factor	D Factor	T Factor
2010	9000 C	S 9000	0	10.77	99.99	5.70

AADT Flags: C = Computed; E = Manual Estimate; F = First Year Estimate
S = Second Year Estimate; T = Third Year Estimate; X = Unknown

COUNTY: 87 MIAMI-DADE

SITE	SITE TYPE	DESCRIPTION	DIRECTION 1	DIRECTION 2	AADT TWO-WAY	"K" FCTR	"D" FCTR	"T" FCTR
6198		RAMP 87260136 FROM SB SR826 TO SW 40 ST, 50' S O	0E	0E	15500 F	9.0	99.9W	5.9P
6199		RAMP 87260137 FROM EB SW 40 ST TO NB SR826, 200'	0E	0E	5900 F	9.0	99.9W	4.4P
6200		RAMP 87260138 FROM WB SW 40 ST TO NB SR826, 200'	0E	0E	6700 F	9.0	99.9W	8.8P
6201		RAMP 87260239 FROM SB SR826 TO WB SW 24 ST, 300'	W 14500	0	14500 C	9.0	99.9W	4.5P
6203		RAMP 87260242 FROM SB SR826 TO WB SW 8 ST, 300'	W 14000	0	14000 C	9.0	99.9W	2.8P
6205		RAMP 87260144 FROM WB SW 8 ST TO NB SR 826, 200'	N 6300	0	6300 C	9.0	99.9W	4.7P
6206		RAMP 87260145 FROM SB SR826 TO WB W FLAGLER ST,	W 16000	0	16000 C	9.0	99.9W	3.6P
6207		RAMP 87260146 FROM WB FLAGLER ST TO NB SR826, 50	0E	0E	10000 S	9.0	99.9W	4.4P
6208		RAMP 87260247 FROM EB NW 36 ST TO SB SR826, 200'	S 7900	0	7900 C	9.0	99.9W	2.7P
6209		RAMP 87260248 FROM SB SR826 TO WB NW 36 ST, 100'	W 21500	0	21500 C	9.0	99.9W	8.0P
6210		RAMP 87260249 FROM NB SR826 TO EB NW 36 ST, 200'	0E	0E	16000 F	9.0	99.9W	8.1P
6211		RAMP 87260250 FROM WB NW 36 ST TO NB SR826, 300'	N 8300	0	8300 C	9.0	99.9W	10.9P
6212		RAMP 87260153 FROM WB NW 167 ST TO WB SR826, 100	W 7100	0	7100 C	9.0	99.9W	4.3P
6213		RAMP 87260154 FROM WB SR826 TO WB NW 167 ST, 100	W 8300	0	8300 C	9.0	99.9W	7.3P
6214		RAMP 87260155 FROM EB SR826 TO EB NW 167 ST, 200	E 6400	0	6400 C	9.0	99.9W	4.3P
6215		RAMP 87260156 FROM EB NW 167 ST TO EB SR826, 200	E 9600	0	9600 C	9.0	99.9W	6.3P

SITE TYPE : BLANK= PORTABLE; T= TELEMETERED
"K" FACTOR : DEPARTMENT ADOPTED STANDARD K FACTOR BEGINING WITH COUNT YEAR 2011
AADT FLAGS : C= COMPUTED; E= MANUAL EST; F= FIRST YEAR EST; S= SECOND YEAR EST; T= THIRD YEAR EST; X= UNKNOWN
"D/T" FLAGS : A= ACTUAL; F= FACTOR CATG; D= DIST FUNCL; P= PRIOR YEAR; S= STATEWIDE DEFAULT; W= ONE-WAY ROAD; X= CROSS REF

Florida Department of Transportation
Transportation Statistics Office
2010 Historical AADT Report

County: 87 - MIAMI-DADE

Site: 6210 - RAMP 87260249 FROM NB SR826 TO EB NW 36 ST, 200' N OF SR 826

Year	AADT	Direction 1	Direction 2	K Factor	D Factor	T Factor
2010	16000 C	E 16000	0	7.59	99.99	8.10
2009	9400 F	0	0	7.48	99.99	5.90
2008	9400 C	E 9400	0	7.43	99.99	5.90
2005	12000 S	E	B	7.10	99.90	5.80
2004	12000 F	E	B	7.00	99.90	5.80
2003	12000 C	E 12000	B	7.10	99.90	5.80

AADT Flags: C = Computed; E = Manual Estimate; F = First Year Estimate
S = Second Year Estimate; T = Third Year Estimate; X = Unknown

Appendix C

Summary of Mechanical and Turning Movement Counts

Summary of Mechanical Counts

(For detailed information see CD Digital Copy)

Summary Of Existing ADT/Daily Truck Volumes and T% Factor
(Along Corridor NW 12 Street and NW 79/ 87/97/107/114 Avenues)

Site #	Location Description	Period	Direction$_1$ Peak Volume Hour	Direction$_1$ Peak Volume Volume	V_1	Seasonal Factor	ADT_1	T_1%	Daily $Trucks_1$	Direction$_2$ Peak Volume Hour	Direction$_2$ Peak Volume Volume	V_2	Seasonal Factor	ADT_2	T_2%	Daily $Trucks_2$	Combined Directions V_{comb}	Seasonal Factor	ADT_{comb}	ADT_{comb} (Rounded)	$T_{\_Comb}$%	Daily Trucks
1	NW 107 Avenue Between NW 25 St. and NW 41 St.	AM	7:45	1226	17118	0.99	16900	4.40%	750	11:45	1173	16490	0.99	16300	5.00%	800	33608	0.99	33272	33300	4.70%	1550
		PM	2:45	1246						2:30	1440											
		Daily	2:45	1246						2:30	1440											
2	NW 97 Avenue Between NW 25 St. and NW 36 St.	AM	7:45	989	10580	0.99	10500	2.00%	200	8:00	946	10901	0.99	10800	3.50%	400	21481	0.99	21266	21300	2.70%	600
		PM	5:00	923						3:45	1022											
		Daily	7:45	989						3:45	1022											
3	NW 87 Avenue Between NW 25 St. and NW 36 St.	AM	7:45	1650	20307	0.99	20100	4.60%	900	8:15	1368	18736	0.99	18500	5.50%	1000	39043	0.99	38653	38700	5.00%	1900
		PM	5:00	1569						4:15	1861											
		Daily	7:45	1650						4:15	1861											
4	NW 79 Avenue Between NW 25 St. and NW 36 St.	AM	8:15	488	7919	0.99	7800	6.60%	500	8:15	778	8786	0.99	8700	7.70%	650	16705	0.99	16538	16500	7.20%	1150
		PM	5:00	783						2:15	898											
		Daily	5:00	783						2:15	898											
5	NW 12 Street Between Ramps TURNPIKE and DOLPHIN MALL	AM	7:45	2538	19557	0.99	19400	4.70%	900	11:45	698	15806	0.99	15600	7.00%	1100	35363	0.99	35009	35000	5.70%	2000
		PM	3:15	1118						5:00	1884											
		Daily	7:45	2538						5:00	1884											
6	NW 12 Street Between NW 111 Avenue and NW 107 Avenue	AM	7:45	1524	18195	0.99	18000	5.50%	1000	11:45	831	13884	0.99	13700	5.20%	700	32079	0.99	31758	31800	5.40%	1700
		PM	5:00	1292						5:00	1219											
		Daily	7:45	1524						5:00	1219											
7	NW 12 Street Between NW 107 Avenue and NW 97 Avenue	AM	7:30	860	13594	0.99	13500	5.20%	700	11:45	950	13758	0.99	13600	4.70%	600	27352	0.99	27078	27100	5.00%	1300
		PM	12:00	440						5:00	1363											
		Daily	7:30	860						5:00	1363											
8	NW 12 Street Between NW 97 Avenue and NW 87 Avenue	AM	7:45	1341	13932	0.99	13800	6.20%	850	11:45	1023	14581	0.99	14400	5.60%	800	28513	0.99	28228	28200	5.90%	1650
		PM	1:00	906						12:30	1076											
		Daily	7:45	1341						12:30	1076											
9	NW 12 Street WEST OF NW 84 Avenue	AM	8:00	2180	16215	0.99	16100	5.10%	800	11:45	1024	14971	0.99	14800	3.70%	550	31186	0.99	30874	30900	4.40%	1350
		PM	12:00	1144						4:45	1472											
		Daily	8:00	2180						4:45	1472											
10	NW 12 Street Between NW 84 Avenue and NW 82 Avenue	AM	8:00	2107	16789	0.99	16600	4.40%	750	11:45	1150	15287	0.99	15100	5.60%	750	32076	0.99	31755	31800	5.00%	1500
		PM	12:45	1207						2:45	1392											
		Daily	8:00	2107						2:45	1392											
11(sta. 5500)	NW 114 Avenue _South of NW 41 Street	AM	11:45	400	4927	1.00	4900	12.54%	600	8:00	680	6210	1.00	6200	6.59%	400	11137	1.00	11137	11100	6.60%	1000
		PM	12:30	423						12:45	506											
		Daily	12:30	423						8:00	680											

1) Direction$_1$: NB or EB
2) Direction$_2$: SB or WB
3) V= Daily Volume Count
4) T%= percentage of Trucks (Daily)
5) T= T% multiplied by ADT

Summary Of Existing ADT and Daily Truck Volumes and T% Factor

(Along Corridor NW 25 Street and SR 826 Ramps)

Station #	Location Description	Period	Direction$_1$							Direction$_2$							Combined Directions					
			Peak Volume		V_1	Seasonal Factor	ADT_1	T_1%	Daily $Trucks_1$	Peak Volume		V_2	Seasonal Factor	ADT_2	T_2%	Daily $Trucks_2$	V_{comb}	Seasonal Factor	ADT_{comb}	ADT_{comb} (Rounded)	$T_{\_Comb}$%	Daily Trucks
			Hour	Volume						Hour	Volume											
64	NW 25 Street _East of TPKE	AM	8:00	946	6288	0.98	**6200**	**10.61**	**650**	7:45	312	5839	0.98	**5700**	**12.35**	**700**	12127	0.98	11884	**11900**	**11.45**	**1350**
		PM	12:30	352						17:00	967											
		Daily	8:00	946						17:00	967											
52	NW 25 Street _East of NW 112 Ave.	AM	7:15	962	7412	1.00	**7400**	**15.93**	**1200**	7:45	476	8023	1.00	**8000**	**10.52**	**850**	15435	1.00	15435	**15400**	**13.12**	**2050**
		PM	15:15	489						17:00	1211											
		Daily	7:15	962						17:00	1211											
51	NW 25 Street _West of NW 107Ave.	AM	7:30	1158	12214	1.00	**12200**	**13.84**	**1700**	7:45	625	10129	1.00	**10100**	**9.60**	**1000**	22343	1.00	22343	**22300**	**11.92**	**2700**
		PM	12:15	890						17:00	1207											
		Daily	7:30	1158						17:00	1207											
61	NW 25 Street _West of NW 102 Pl.	AM	7:30	959	10914	0.98	**10700**	**11.58**	**1200**	11:45	656	9913	0.98	**9700**	**10.06**	**1000**	20827	0.98	20410	**20400**	**10.86**	**2200**
		PM	13:30	753						17:00	887											
		Daily	7:30	959						17:00	887											
82	NW 25 Street _West of NW 97 Ave.	AM	7:15	1370	14570	0.97	**14100**	**10.44**	**1500**	7:30	907	13786	0.97	**13400**	**12.10**	**1600**	28356	0.97	27505	**27500**	**11.25**	**3100**
		PM	16:30	1029						16:00	1238											
		Daily	7:15	1370						16:00	1238											
80	NW 25 Street _West of NW 82 Ave	AM	8:00	1249	15728	0.97	**15300**	**11.51**	**1750**	8:30	1184	16912	0.97	**16400**	**8.43**	**1400**	32640	0.97	31661	**31700**	**9.92**	**3150**
		PM	16:15	1330						16:00	1238											
		Daily	16:15	1330						16:00	1238											
2221	NW 25 Street _West of SB Ramps of SR 826	AM	10:45	1430	22904	1.00	**22900**	**12.17**	**2800**	8:15	1673	19864	1.00	**19900**	**15.60**	**3100**	42768	1.00	42768	**42800**	**13.76**	**5900**
		PM	16:15	2044						12:00	1370											
		Daily	16:15	2044						8:15	1673											
93	On Ramp to SR 826_N from NW 25 St.	AM	11:15	545	9593	0.98	**9400**	**14.87**	**1400**								9593	0.98	9400	**9400**	**14.87**	**1400**
		PM	16:30	640																		
		Daily	16:30	640																		
91	Viaduct Ramp WB to SR 826_N	AM	11:30	71	1670	0.99	**1700**	**14.19**	**250**								1670	0.99	1653	**1700**	**14.19**	**250**
		PM	14:15	166																		
		Daily	14:15	166																		
90	Viaduct Ramp _EB from NW 25 ST _EB	AM	8:30	244	2711	0.97	**2600**	**20.29**	**550**								2711	0.97	2630	**2600**	**20.29**	**550**
		PM	14:15	194																		
		Daily	8:30	244																		
97	Off Ramp SR 826_SB to NW 25 St	AM	7:15	1359	15533	0.99	**15400**	**10.33**	**1600**								15533	0.99	15378	**15400**	**10.33**	**1600**
		PM	12:30	1198																		
		Daily	7:15	1359																		
96	On Ramp SR 826_SB from NW 25 St_EB	AM	10:30	519	8337	0.99	**8300**	**13.17**	**1100**								8337	0.99	8254	**8300**	**13.17%**	**1100**
		PM	16:15	721																		
		Daily	16:15	721																		

1) Direction$_1$: NB or EB
2) Direction$_2$: SB or WB
3) V= Daily Volume Count
4) T%= percentage of Trucks (Daily)
5) T= T% multiplied by ADT

Summary Of Existing ADT and Daily Truck Volumes and T% Factor
(Along Corridor NW 41 Street/NW 36 Street & HEFT and SR 826 Ramps)

Station #	Location Description	Period	Direction$_1$ Peak Volume Hour	Direction$_1$ Peak Volume Volume	V_1	Seasonal Factor	ADT_1	T_1%	Daily $Trucks_1$	Direction$_2$ Peak Volume Hour	Direction$_2$ Peak Volume Volume	V_2	Seasonal Factor	ADT_2	T_2%	Daily $Trucks_2$	Combined Directions V_{comb}	Seasonal Factor	ADT_{comb}	ADT_{comb} (Rounded)	$T_{\_Comb}$%	Daily Trucks
52	On Ramp TPKE_SB from NW 36 St_EB	AM	6:30	45	532	0.97	500	12.78	65								532	0.97	516	500	12.78	65
		PM	17:00	88																		
		Daily	17:00	88																		
42	NW 41 St _ West of Turnpike	AM	8:00	1772	8880	0.97	8600	10.83	950	7:30	539	9203	0.97	8900	4.81	400	18083	0.97	17541	17500	7.77	1350
		PM	16:00	461						16:15	1075											
		Daily	8:00	1772						16:15	1075											
41	NW 41 St _ East of Turnpike	AM	7:45	2654	18582	0.97	18000	9.43	1700	7:30	774	15105	0.97	14700	10.51	1500	33687	0.97	32676	32700	9.92	3200
		PM	17:15	998						16:15	1997											
		Daily	7:45	2654						16:15	1997											
4400	NW 41 St _NW 112 Ave.	AM	7:45	945	10106	1.00	10100	5.25	550	11:45	842	12863	1.00	12900	7.65	1000	22969	1.00	22969	23000	6.60	1500
		PM	12:15	655						17:00	1201											
		Daily	7:45	945						17:00	1201											
21	NW 41 St _ West of NW 102 Ave.	AM	8:00	2258	22147	0.97	21500	5.86	1300	7:45	1269	20659	0.97	20000	8.58	1700	42806	0.97	41522	41500	7.17	3000
		PM	16:00	1613						16:45	2081											
		Daily	8:00	2258						16:45	2081											
22	NW 41 St _ East of NW 97 Ave.	AM	8:00	1946	21025	0.97	20400	8.55	1750	11:30	1337	19623	0.97	19000	11.17	2150	40648	0.97	39429	39400	9.82	3900
		PM	12:30	1417						17:45	1505											
		Daily	8:00	1946						17:45	1505											
31	NW 36 St _ East of NW 87 Ave.	AM	8:00	1669	21293	0.97	20700	9.74	2050	7:45	1586	21768	0.97	21100	9.65	2000	43061	0.97	41769	41800	9.69	4050
		PM	13:15	1415						16:00	1563											
		Daily	8:00	1669						7:45	1586											
32	On Ramp SR 826_SB from NW 36 St_EB	AM	11:45	573	9623	0.98	9400	6.20	580								9623	0.98	9431	9400	6.20	580
		PM	16:45	988																		
		Daily	16:45	988																		
34	On Ramp SR 826_SB from NW 36 St_EB	AM	11:30	515	7619	0.99	7500	2.35	180								7619	0.99	7543	7500	2.35	180
		PM	17:00	700																		
		Daily	17:00	700																		
43	Off Ramp SR 826_NB from NW 36 St_WB	AM	11:45	454	6786	1.00	6800	5.14	350								6786	1.00	6786	6800	5.14	350
		PM	15:00	600																		
		Daily	15:00	600																		
38	Off Ramp SR 826_SB to NW 36 St_WB(FF)	AM	7:45	928	9522	0.99	9400	6.90	650								9522	0.99	9427	9400	6.90	650
		PM	15:00	752																		
		Daily	7:45	928																		
44	NW 36 St _ West of SR 826/Palmetto Expwy	AM	7:45	2200	21675	0.98	21200	10.11	1800	8:00	1928	20027	0.98	19600	9.00%	2100	41702	0.98	40867.96	40900	9.58	3900
		PM	17:45	1992						17:30	1574											
		Daily	7:45	2200						8:00	1928											
5500	NW 114 Ave South NW 41 St	AM	11:45	400	4927	1.00	4900	12.54	600	8:00	680	6210	1.00	6200	6.59%	400	11137	0.99	11025.63	11000	9.22	1000
		PM	12:30	423						12:45	506											
		Daily	12:30	423						8:00	680											

2011 FDOT Counts

Site	Location Description	AADT	T%	Trucks
970293*	SB Off Ramp TPKE to NW 36 ST	9000	5.69	500
970292*	NB On Ramp to TPKE from NW 41 St	8600	5.69	490
876210*	NB Off Ramp from SR 826/Palmetto	16,000	8.1	1300

1) $Direction_1$: NB or EB
2) $Direction_2$: SB or WB
3) V= Daily Volume Count
4) T%= percentage of Trucks (Daily)
5) T= T% multiplied by ADT

Source(*) : 2011 FDOT Counts

Turning Movement Counts

(For detailed information see CD Digital Copy)

Appendix D

Capacity Analysis Existing Conditions

(For detailed information see CD Digital Copy)

NW 12 Street between NW 82 Avenue and SR 821/HEFT

Existing Conditions - AM

		Eastbound			Westbound			Northbound			Southbound			Intersection
		L	T	R	L	T	R	L	T	R	L	T	R	
Trnpk SB Ramps	Delay (s)	9.8	12.1			28.7	0.1				30.7		0.1	19.9
	LOS	A	B			C	A				C		A	B
Trnpk NB Ramps	Delay (s)	34.6	3.9			18.9	0.1				36.4		0.1	28.1
	LOS	C	A			B	A				D		A	C
NW 111 Avenue	Delay (s)	54.8	34.6		15.3	17.7		42.3	22.2	25.7	17.5	19.3	18.8	35.3
	LOS	D	C		B	B		D	C	C	B	B	B	D
NW 107 Avenue	Delay (s)	78.3	66.1	51.9	73.9	52.5		78.2	38.2	98.6	74.4	26.4	24.4	57.1
	LOS	E	E	D	E	D		E	D	F	E	C	C	E
NW 97 Avenue	Delay (s)		8.0	4.4		5.4			34.5			45.7	41.2	9.2
	LOS		A	A		A			C			D	D	A
SR 826 WB On-Ramp	Delay (s)		59.9		3.2									47.9
	LOS		E		A									D
NW 87 Avenue	Delay (s)	83.7	35.0	38.9	64.0	49.9	54.7	16.9	31.6	221.5	44.1	18.8		77.7
	LOS	F	D	D	E	D	D	B	C	F	D	B		E
NW 8500 Block	Delay (s)	10.4	24.5			14.1		55.5		70.2		10.2		35.8
	LOS	B	C			B		E		E		B		D
NW 84 Avenue	Delay (s)	14.6	14.2			8.2					97.8		37.9	22.4
	LOS	B	B			A					F		D	C
NW 82 Avenue	Delay (s)	33.0	3.5			16.2					57.2		44.7	15.8
	LOS	C	A			B					E		D	B
Total Delay (s)		676.2			422.9			735.4			601.0			2435.5
Total Delay (h)		0.2			0.1			0.2			0.2			0.7

Existing Conditions - PM

		Eastbound			Westbound			Northbound			Southbound			Intersection
		L	T	R	L	T	R	L	T	R	L	T	R	
Trnpk SB Ramps	Delay (s)	8.1	5.3			6.7	0.2				71.2		1.3	14.8
	LOS	A	A			A	A				E		A	B
Trnpk NB Ramps	Delay (s)	67.0	1.9			14.8	0.5				69.0		0.1	20.2
	LOS	E	A			B	A				E		A	C
NW 111 Avenue	Delay (s)	47.0	17.8		13.9	28.6		115.1	20.2	25.2	15.6	16.7	39.5	27.8
	LOS	D	B		B	C		F	C	C	B	B	D	C
NW 107 Avenue	Delay (s)	69.9	71.5	156.6	68.5	58.8		86.4	35.9	31.5	70.4	50.2	35.5	71
	LOS	E	E	F	E	E		F	D	C	E	D	D	E
NW 97 Avenue	Delay (s)		3.2	2.5		4.3			51.4			54.2	47.8	9.8
	LOS		A	A		A			D			D	D	A
SR 826 WB On-Ramp	Delay (s)		70.7		8.6									30.2
	LOS		E		A									C
NW 87 Avenue	Delay (s)	130.9	75.0	298.1	81.3	88.6	88.3	235.0	25.9	22.8	17.8	38.9		70
	LOS	F	E	F	F	F	F	F	C	C	B	D		E
NW 8500 Block	Delay (s)	1.7	1.5			5.7		74.5		62.6		2.8		16.2
	LOS	A	A			A		E		E		A		B
NW 84 Avenue	Delay (s)	103.8	5.1			13.6					160.5		178.2	54.4
	LOS	F	A			B					F		F	D
NW 82 Avenue	Delay (s)	8.1	6.5			13.7					63.9		76.9	28.6
	LOS	A	A			B					E		E	C
Total Delay (s)		1152.2			496.1			786.5			1010.5			3445.3
Total Delay (h)		0.3			0.1			0.2			0.3			1.0

NW 25 Street between SR 826 NB On-Ramp and NW 117 Avenue

Existing Conditions - AM

		Eastbound			Westbound			Northbound			Southbound			Intersection
		L	T	R	L	T	R	L	T	R	L	T	R	
NW 117 Avenue	Delay (s)	11.2			11.7						---	---		---
	LOS	B			B						F	F		F
NW 112 Avenue	Delay (s)	8.3	15.3		10.1	13.3		25.3	30.5		55.3	26.4		20.7
	LOS	A	B		B	B		C	C		E	C		C
NW 107 Avenue	Delay (s)	39.3	60.4		74.0	47.7		31.2	51.5	33.9	118.1	34.8		49.1
	LOS	D	E		E	D		C	D	C	F	C		D
NW 97 Avenue	Delay (s)	21.7	57.6		46.0	31.0		31.6	73.8		55.7	39.2		52.6
	LOS	C	E		D	C		C	E		E	D		D
NW 87 Avenue	Delay (s)	74.5	1270.9	71.1	68.9	797.1	53.2	12.9	21.3	19.2	16.4	14.5		310.6
	LOS	E	F	E	E	F	D	B	C	B	B	B		F
NW 82 Avenue	Delay (s)	17.7	48.5		96.4	16.8		45.5	59.5	50.3	44.0	72.4		45.4
	LOS	B	D		F	B		D	E	D	D	E		D
NW 79 Avenue	Delay (s)	100.3	12.0		11.4	32.9	23.0	87.3	71.1		933.1	1184.6	58.7	88.4
	LOS	F	B		B	C	C	F	E		F	F	E	F
SR 826 SB Off-Ramp	Delay (s)		29.4	0.1	34.4	20.0					71.5		2.0	24.6
	LOS		C	A	C	B					E		A	C
SR 826 NB On-Ramp	Delay (s)	117.0	13.9			26.7	26.3	77.8		54.1				46.9
	LOS	F	B			C	C	E		D				D
Total Delay (s)		1969.2			1440.9			776.8			2726.7			6913.6
Total Delay (h)		0.5			0.4			0.2			0.8			1.9

Existing Conditions - PM

		Eastbound			Westbound			Northbound			Southbound			Intersection
		L	T	R	L	T	R	L	T	R	L	T	R	
NW 117 Avenue	Delay (s)	14.6			8.2						---	---		---
	LOS	B			A						F	F		F
NW 112 Avenue	Delay (s)	13.5	15.0		9.9	23.6		24.1	25.1		22.2	33.8		24.4
	LOS	B	B		A	C		C	C		C	C		C
NW 107 Avenue	Delay (s)	33.7	39.5		68.4	44.1		60.2	45.0	34.9	77.5	50.6		48.4
	LOS	C	D		E	D		E	D	C	E	D		D
NW 97 Avenue	Delay (s)	52.6	58.0		80.1	30.9		36.3	45.5		32.4	51.0		47.5
	LOS	D	E		F	C		D	D		C	D		D
NW 87 Avenue	Delay (s)	90.6	932.0	133.3	74.5	1237.1	72.6	12.1	13.2	12.0	8.8	15.5		326.3
	LOS	F	F	F	E	F	E	B	B	B	A	B		F
NW 82 Avenue	Delay (s)	22.3	22.8		69.2	15.8		54.9	125.2	141.4	58.9	112.0		47.8
	LOS	C	C		E	B		D	F	F	E	F		D
NW 79 Avenue	Delay (s)	72.1	12.5		7.1	23.2	24.2	77.8	61.5		2099.7	2325.3	66.9	295.6
	LOS	E	B		A	C	C	E	E		F	F	E	F
SR 826 SB Off-Ramp	Delay (s)		30.3	0.1	60.3	17.2					66.5		0.4	27
	LOS		C	A	E	B					E		A	C
SR 826 NB On-Ramp	Delay (s)	38.1	46.5			22.2	23.2	75.1		58.3				37.4
	LOS	D	D			C	C	E		E				D
Total Delay (s)		1627.5			1911.8			902.6			5021.5			9463.4
Total Delay (h)		0.5			0.5			0.3			1.4			2.6

NW 36/41 Street between SR 826 NB On-Ramp and SR 821/HEFT

Existing Conditions - AM

		Eastbound			Westbound			Northbound			Southbound			Intersection
		L	T	R	L	T	R	L	T	R	L	T	R	
Trnpk SB Ramps	Delay (s)		29.7			20.8					19.4		0.0	19.9
	LOS		C			C					B		A	B
Trnpk NB Ramps	Delay (s)	2.1	7.9			3.4	0..4	82.2		4.1				6
	LOS	A	A			A	A	F		A				A
NW 115 Avenue	Delay (s)				7.6			1947.2						95.5
	LOS				F			F						D
NW 114 Avenue	Delay (s)	14.2	31.2		259.1	21.3		69.2	100.4		101.7	114.1	65.4	55.6
	LOS	B	C		F	C		E	F		F	F	E	E
NW 112 Avenue	Delay (s)	12.4	18.3			22.1					26.7		24.2	21.3
	LOS	B	B			C					C		C	C
NW 107 Avenue	Delay (s)	26.8	173.7		96.0	31.0		71.3	80.0	65.9	67.2	91.2		114.9
	LOS	C	F		F	C		E	E	E	E	F		F
NW 102 Avenue	Delay (s)	882.8	29.8		76.2	15.8			106.4	71.4	83.0	54.0	49.5	84.2
	LOS	F	C		E	B			F	E	F	D	D	F
NW 97 Avenue	Delay (s)	92.2	39.0		94.8	25.1		85.0	84.6		94.2	68.7		54.8
	LOS	F	D		F	C		F	F		F	E		D
NW 87 Avenue	Delay (s)	73.3	31.9		76.4	29.8		79.8	91.2	72.9	75.0	104.4		57.7
	LOS	E	C		E	C		E	F	E	E	F		E
NW 82 Avenue	Delay (s)	13.7	13.6		66.0	10.9		63.3	82.7		64.6	66.8		22
	LOS	B	B		E	B		E	F		E	E		C
NW 79 Avenue	Delay (s)	130.9	47.8		134.0	138.4		62.3	135.8	58.6	1914.4	388.9		184.3
	LOS	F	D		F	F		E	F	E	F	F		F
SR 826 SB Off-Ramp	Delay (s)		7.4			13.8					55.7			21.1
	LOS		A			B					E			C
SR 826 NB On-Ramp	Delay (s)		18.2			16.6		41.9						21.4
	LOS		B			B		D						C
Total Delay (s)		1696.9			1159.1			3456.2			3529.1			9841.3
Total Delay (h)		0.5			0.3			1.0			1.0			2.7

Existing Conditions - PM

		Eastbound			Westbound			Northbound			Southbound			Intersection
		L	T	R	L	T	R	L	T	R	L	T	R	
Trnpk SB Off-Ramp	Delay (s)		6.1			5.9					22.1		0.0	18.7
	LOS		A			A					C		A	B
Trnpk NB On-Ramp	Delay (s)	2.3	1.9			3.1	4.3	70.7		0.6				3.3
	LOS	A	A			A	A	E		A				A
NW 114 Avenue	Delay (s)	160.3	19.8		29.7	38.0		87.1	113.2		98.3	161.3	194.7	67.8
	LOS	F	B		C	D		F	F		F	F	F	E
NW 112 Avenue	Delay (s)	145.2	8.4			22.3					26.1		25.0	31.5
	LOS	F	A			C					C		C	C
NW 107 Avenue	Delay (s)	63.7	71.7		116.0	100.1		107.0	83.9	53.4	53.1	82.5		88.1
	LOS	E	E		F	F		F	F	D	D	F		F
NW 102 Avenue	Delay (s)	145.2	14.9		89.3	30.8			62.4	59.0	65.3	43.5	41.4	35.7
	LOS	F	B		F	C			E	E	E	D	D	D
NW 97 Avenue	Delay (s)	79.4	24.4		93.6	28.8		75.6	62.7		74.4	57.6		47.9
	LOS	E	C		F	C		E	E		E	E		D
NW 87 Avenue	Delay (s)	91.4	46.1		72.7	60.4		74.7	49.6	47.1	73.8	63.5		58.6
	LOS	F	D		E	E		E	D	D	E	E		E
NW 82 Avenue	Delay (s)	9.2	8.2		31.9	21.2		178.6	71.2		102.8	70.8		24.4
	LOS	A	A		C	C		F	E		F	E		C
NW 79 Avenue	Delay (s)	110.1	54.6		124.2	27.5		203.8	454.0	267.5	2995.4	316.4		251
	LOS	F	D		F	C		F	F	F	F	F		F
SR 826 SB Off-Ramp	Delay (s)		1.7			7.8					72.4			11.9
	LOS		A			A					E			B
SR 826 NB On-Ramp	Delay (s)		5.7			6.3		66.2						13.7
	LOS		A			A		E						B
Total Delay (s)		1070.3			913.9			2188.3			4640.4			8812.9
Total Delay (h)		0.3			0.3			0.6			1.3			2.4

Appendix E

Miami-Dade County

NW 41St Street at NW 115th Avenue Intersection

SIGNAL HEAD & SIGNS DETAILS

NOTES

1. DEMAND WATTAGE FOR THIS INTERSECTION IS 491 WATTS.
2. F.P.L. REPRESENTATIVE CARLOS ECHEGOYAN TEL. (305) 599-4023
3. AT&T REPRESENTATIVE ENRIQUE RODRIGUEZ TEL. (305) 222-8720
4. SIGNAL TIMIMG TO BE PROVIDED TO CONTRACTOR BY MIAMI-DADE COUNTY SIGNALS & SIGNS DIVISION.
5. AT&T PICK-UP POINT TO BE LOCATED AT UNDERGROUND SPLICE. CONTRACTOR SHALL CONTACT & COORDINATE WITH AT&T TO LOCATE AND CONNECT TO AT&T FACILITIES.

CONTROLLER OPERATIONS

1. MAJOR STREET IS NW 41 ST , MINOR STREET IS NW 115 AV .
2. SIGNAL OPERATING PLAN IS AS SHOWN.
3. PHASE(S) 1, 2, 4, 5 & 6 ACTUATED, PHASE 3 RECALL.
4. MOVEMENT(S) 1, 3, 5 & 7 IS (ARE) PROTECTED/PERMISSIVE.
5. SIGNAL COORDINATION PHASE IS 3
6. FLASHING OPERATION: NW 41 ST YELLOW, NW 115 AV RED.

DETECTORS FOR LOOPS

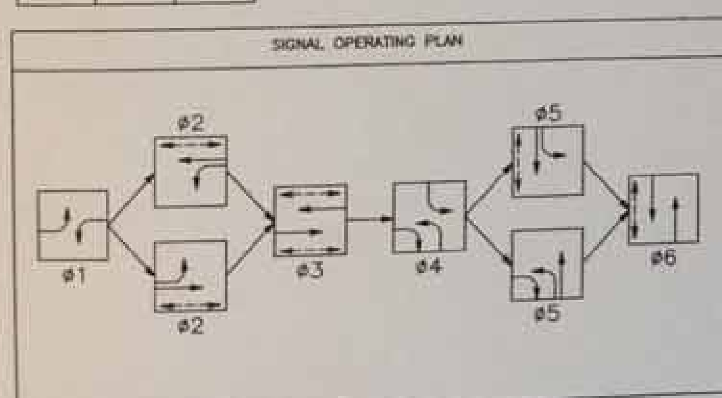
LOOP NO	NO OF LOOPS	NO OF DETS
L-1	1	1
L-4	1	1
L-5	1	1
L-7	1	1

LOOP ASSEMBLY IS SHOWN TO DEMONSTRATE INITIAL DETECTION ZONES ONLY.

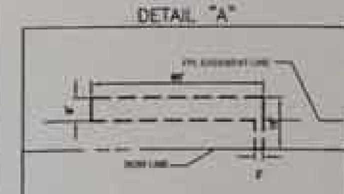
VIDEO DETECTOR ASSIGNMENT

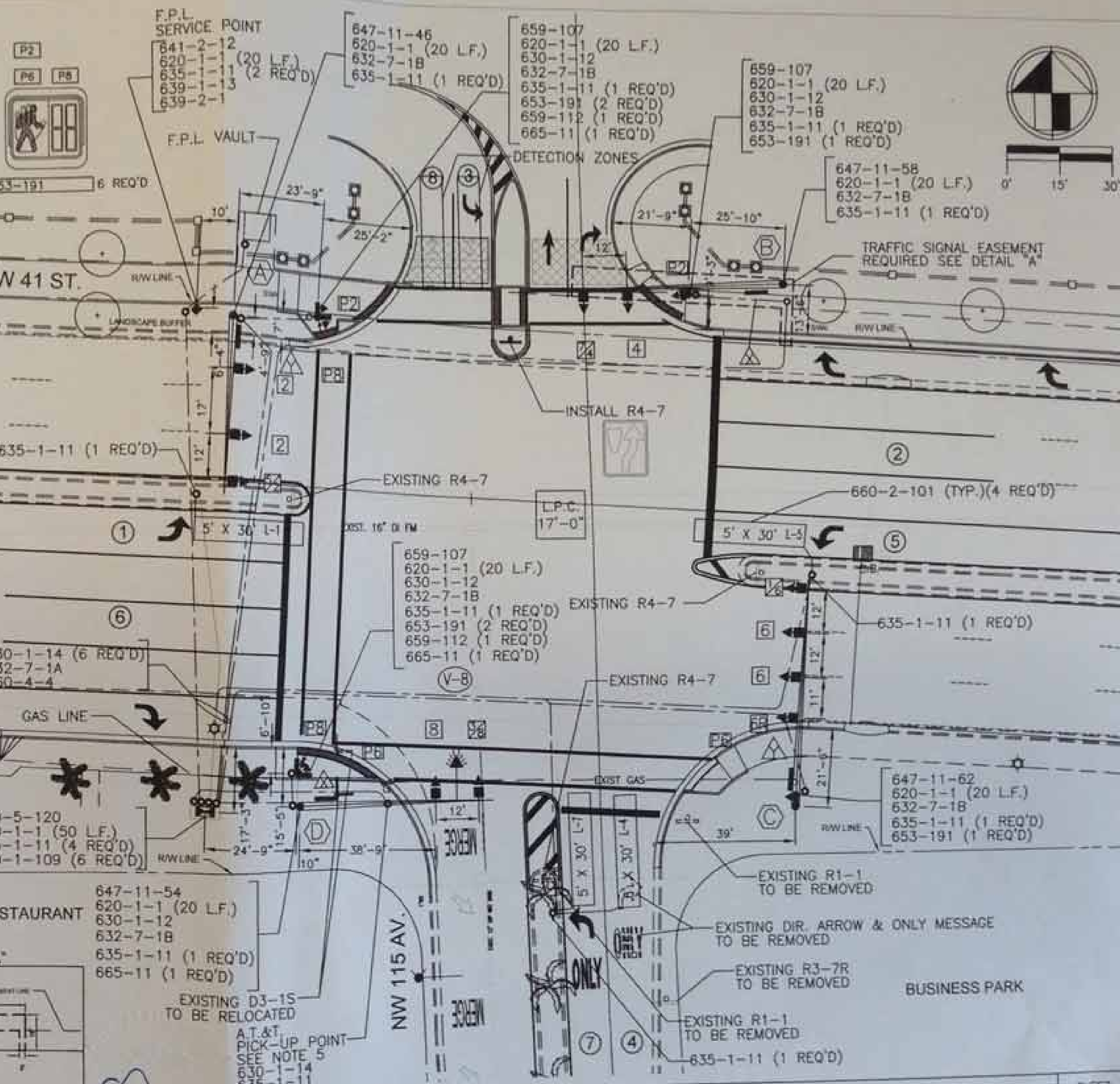
UNIT NO	MOVEMENT NO
V-3-8	3
V-3-8	8

SIGNAL OPERATING PLAN



DETAIL "A"





REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

5/17/12

HENRY A. FANDREI P.E., PTOE, FL PE # 31478

FCI FANDREI CONSULTING INC. Traffic Engineering Services
ENGINEERING BUSINESS No. 26574

DESIGN	DRAWN	DATE	PROJECT NUMBER
HAF/DRM	DRM	3/8/2012	1108

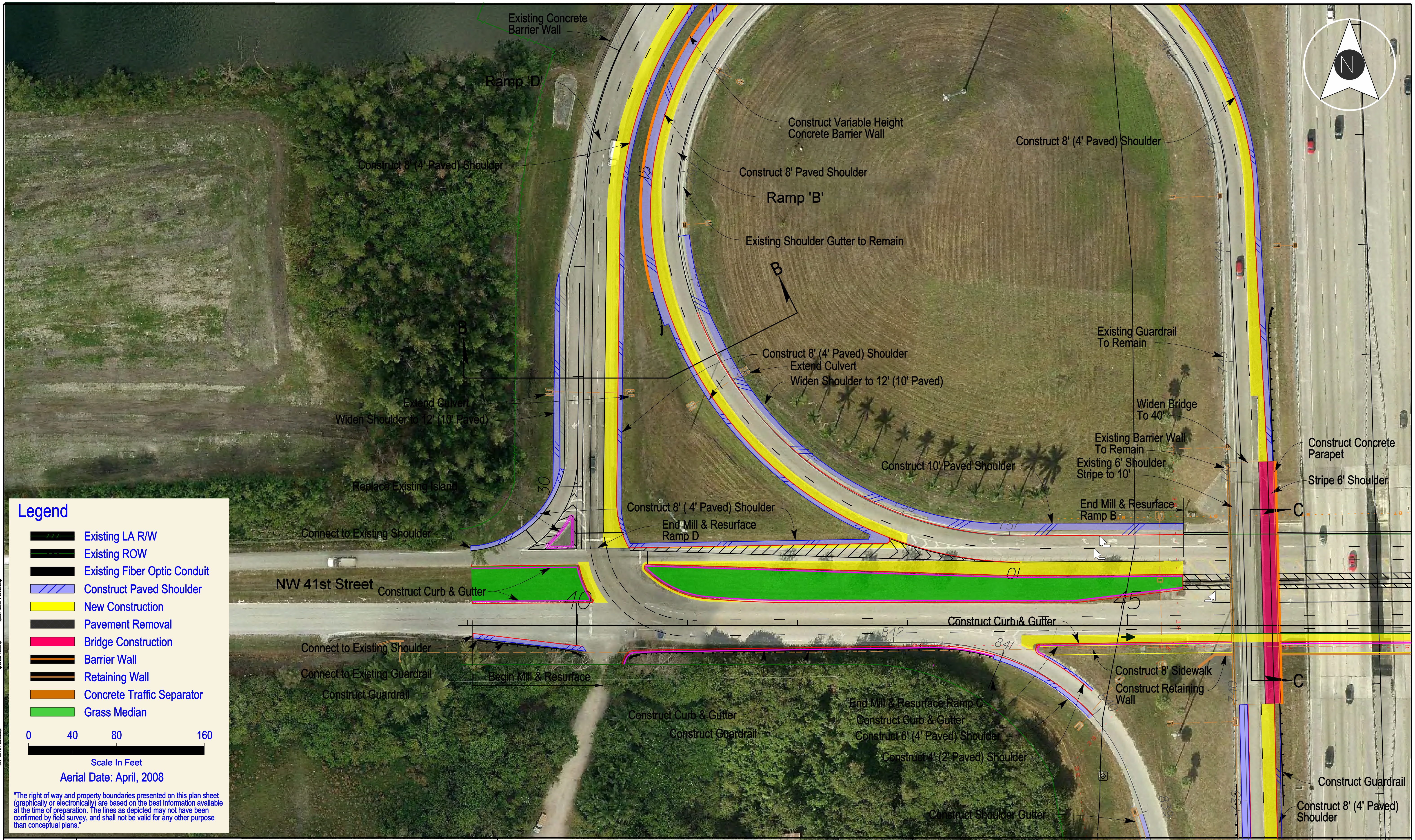
SIGNALIZATION PLAN
NW 41 STREET & NW 115 AVENUE
INTERSECTION ID No. 6908

SHEET NO. 7

Appendix F

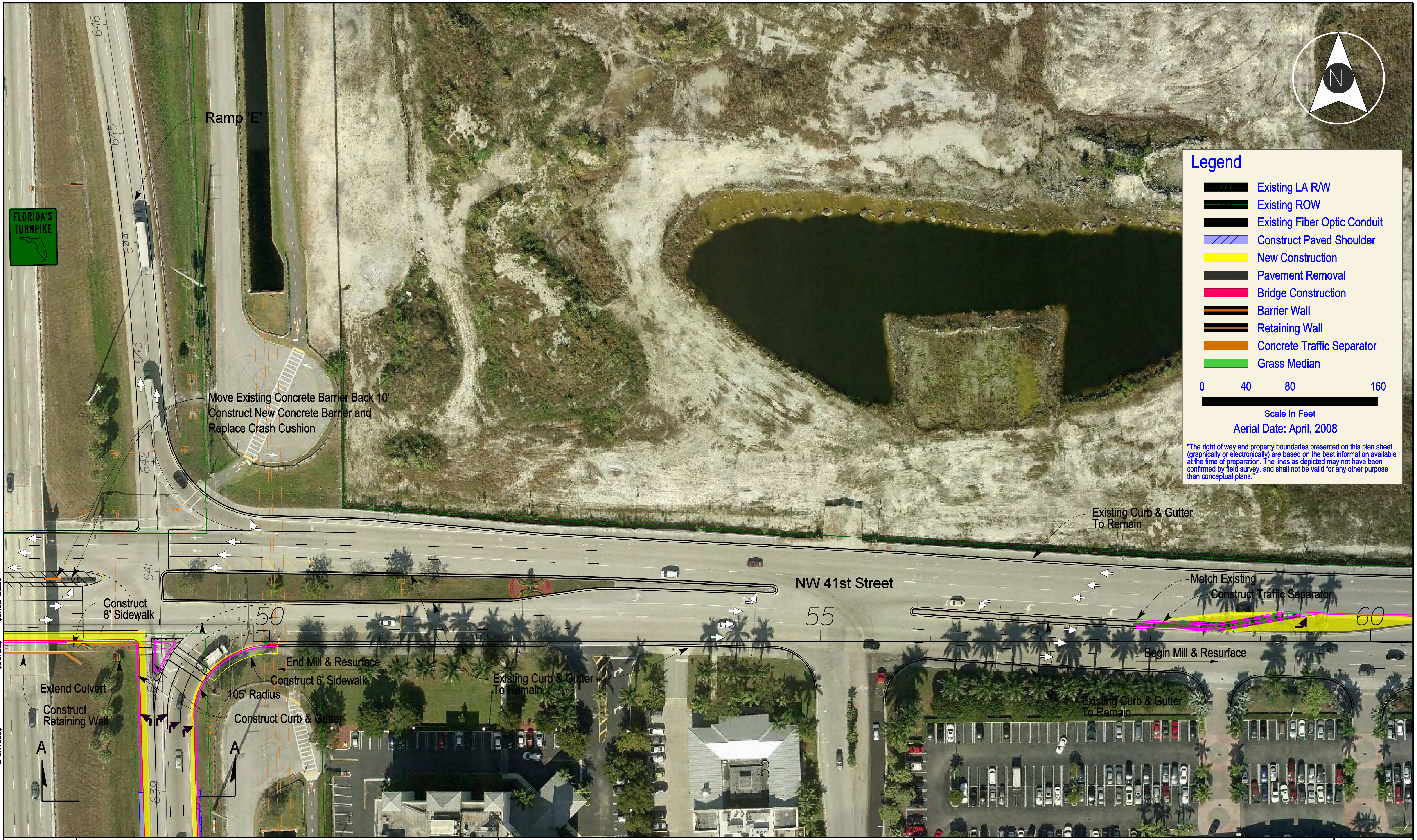
Turnpike Design Concept Plans
HEFT/NW 41st Street Interchange

Design Concept Report	HEFT At NW 41st Street Intersection Improvement	Plan Sheet Alternative 2	Exhibit 1 of 5



FLORIDA'S TURNPIKE ENTERPRISE	Design Concept Report	HEFT At NW 41st Street Intersection Improvement	Plan Sheet Alternative 2

Exhibit



FLORIDA'S TURNPIKE ENTERPRISE	Design Concept Report	HEFT At NW 41st Street Intersection Improvement	Plan Sheet Alternative 2

Exhibit

3 of 5

Florida's Turnpike Enterprise	Design Concept Report	HEFT At NW 41st Street Intersection Improvement	Plan Sheet Alternative 2	Exhibit 4 of 5

$SHEETSIZE$ $SCALE$ $PENTBL$ $TIME$ DGN$$$$$SPECIFICATION$$$$$ $$$$$SYTIME$$$$$ $PLTDRV$

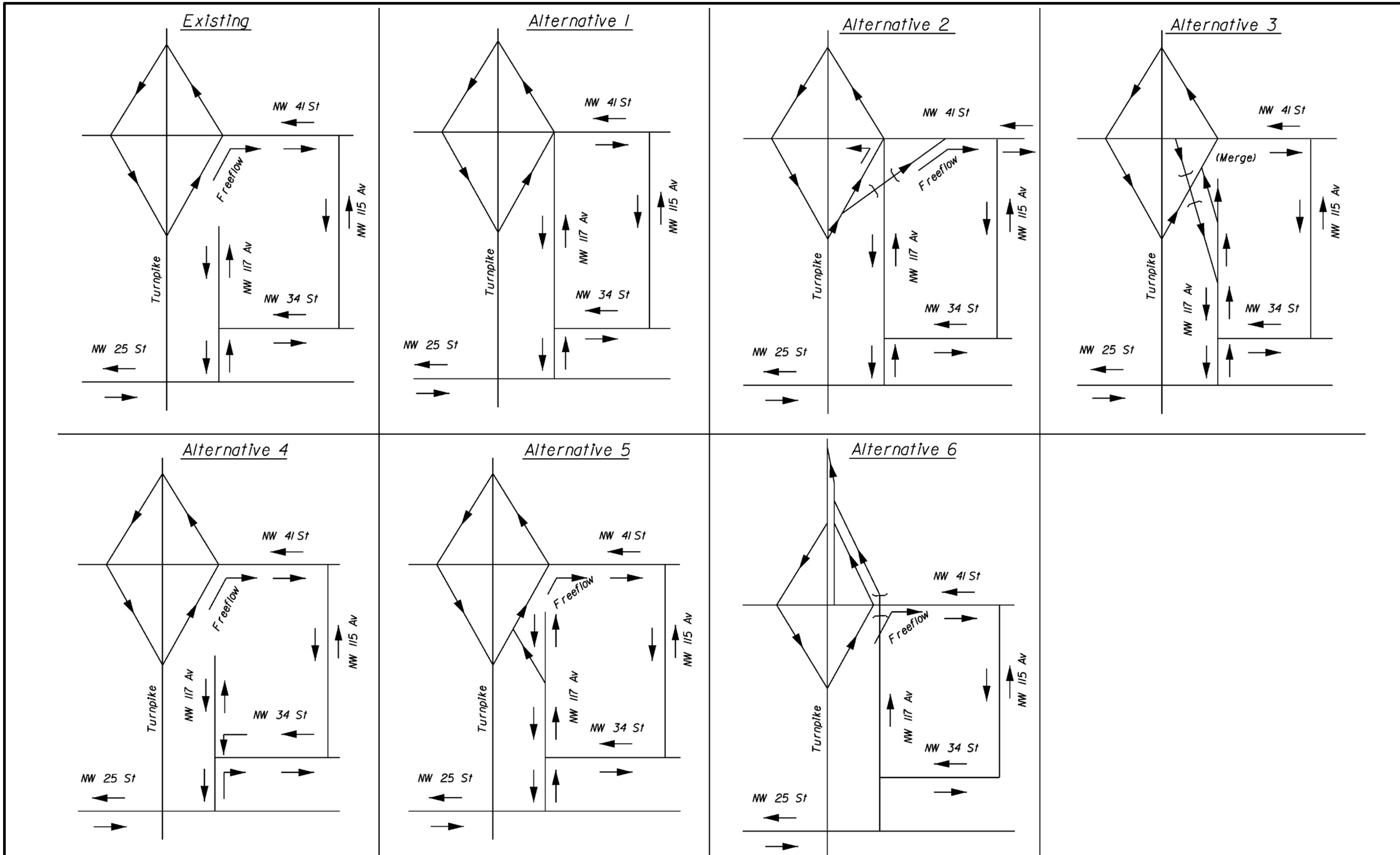
Design Concept Report	HEFT At NW 41st Street Intersection Improvement	Plan Sheet Alternative 2	Exhibit 5 of 5

$SHEETSIZE$ $SCALE$ $PENTBL$ $TIME$ DGN$$$$$$$SPECIFICATION$$ $$$$$SYTIME$$$$$ $PLTDRV$

Appendix G

Alternatives

Schematics and Concept Plans



Miami-Dade
Metropolitan Planning Organization

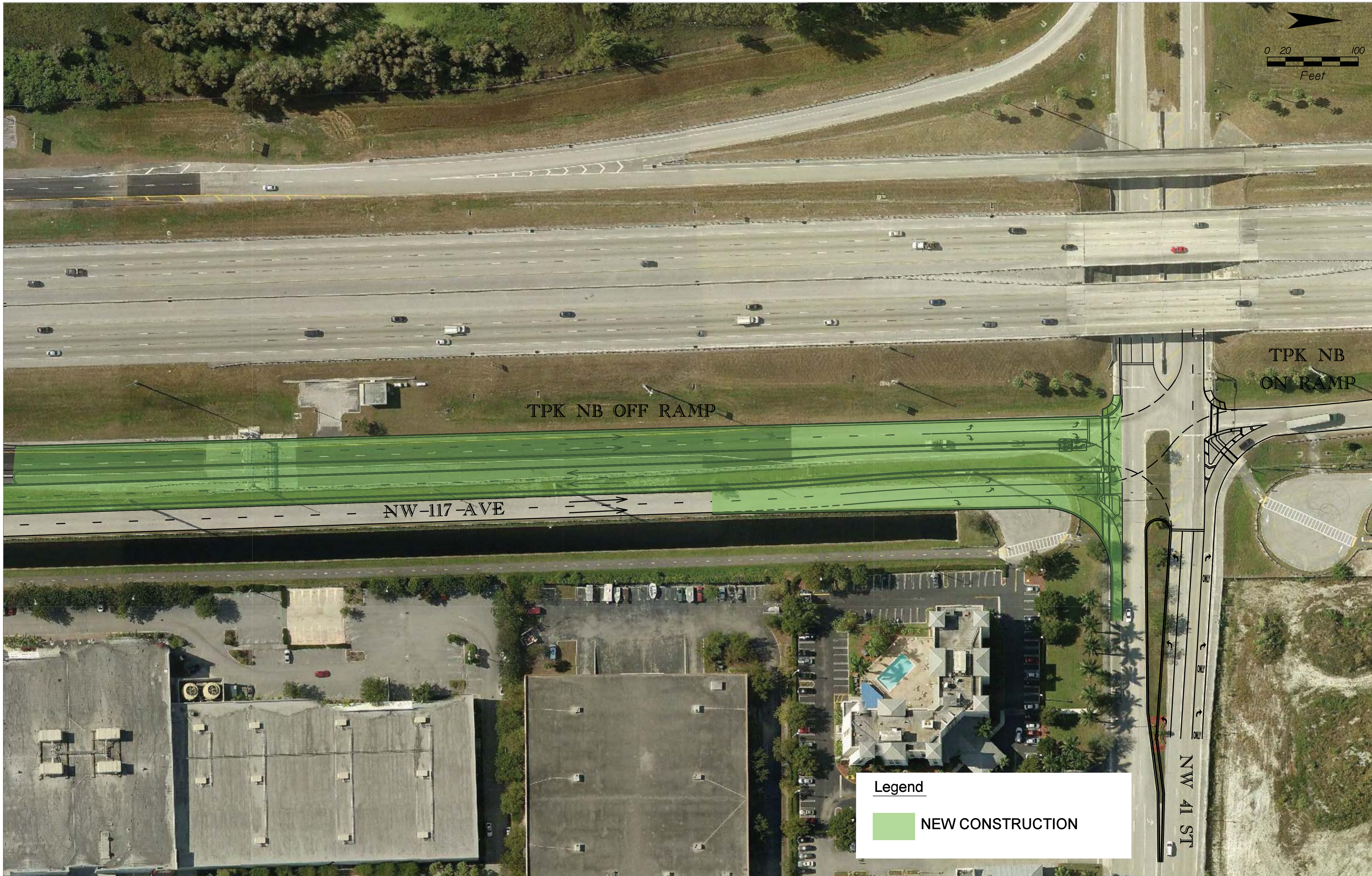
Connecting NW 25th Street to the HEFT Study

Alternatives Directional Flow

Miami-Dade Metropolitan Planning Organization

CONNECTING NW 25th STREET TO THE HEFT STUDY

ALTERNATIVE 1



Miami-Dade Metropolitan Planning Organization

CONNECTING NW 25th STREET TO THE HEFT STUDY

ALTERNATIVE 1

NW 25 ST
NW 117 AVE
0 20 100
Feet
NW 117 AVE
TPK NB OFF RAMP
NW 117 AVE
NW 34 ST
Legend
BRIDGE
NEW CONSTRUCTION

Miami-Dade Metropolitan Planning Organization | MARLIN ENGINEERING | CONNECTING NW 25th STREET TO THE HEFT STUDY | ALTERNATIVE 2

Legend

BRIDGE

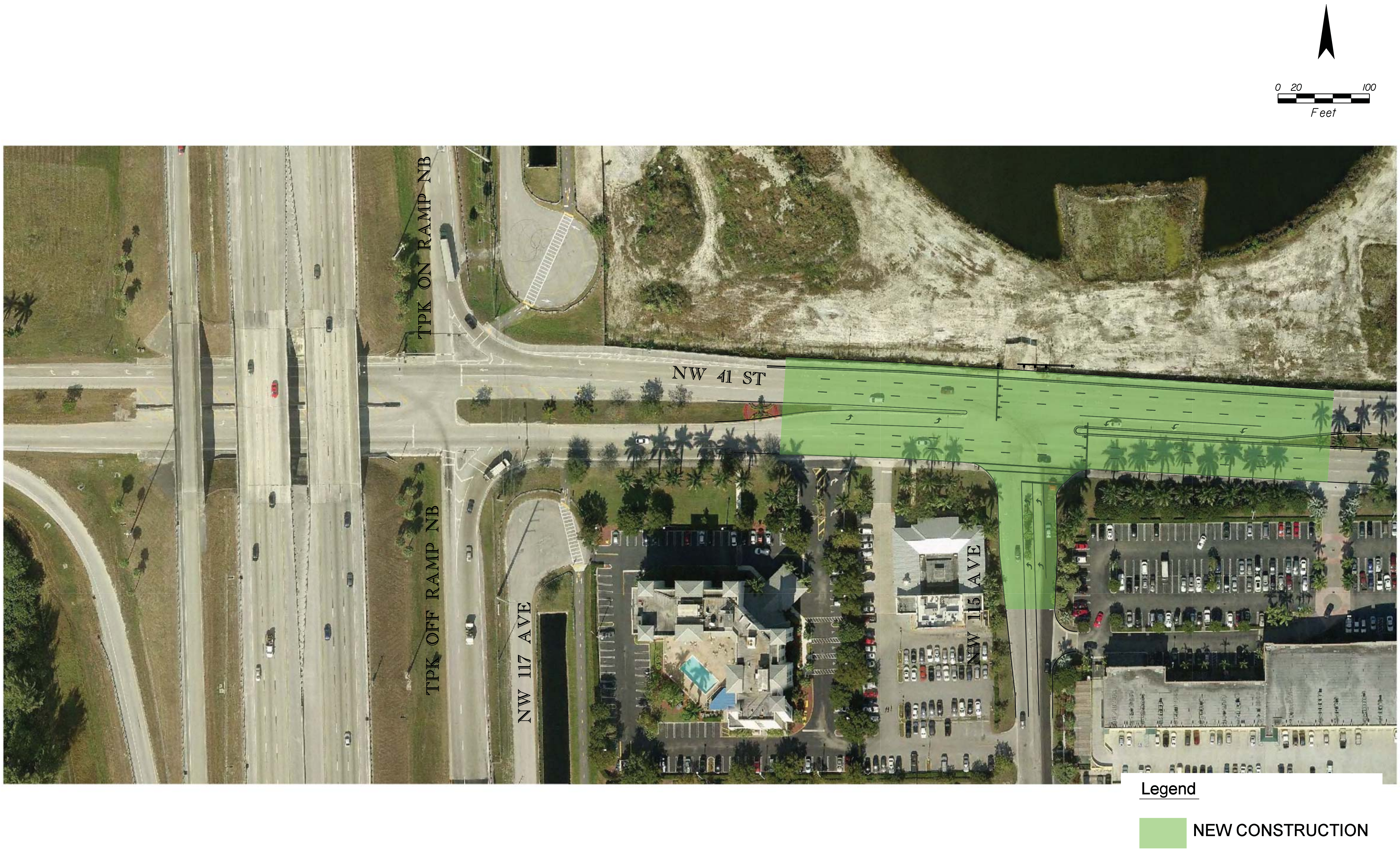
NEW CONSTRUCTION

Miami-Dade Metropolitan Planning Organization | MARLIN ENGINEERING | CONNECTING NW 25th STREET TO THE HEFT STUDY | ALTERNATIVE 3 |

Miami-Dade Metropolitan Planning Organization

CONNECTING NW 25th STREET TO THE HEFT STUDY

ALTERNATIVE 4



Miami-Dade Metropolitan Planning Organization	MARLIN ENGINEERING	CONNECTING NW 25th STREET TO THE HEFT STUDY	ALTERNATIVE 4	2 of 2

Miami-Dade Metropolitan Planning Organization

CONNECTING NW 25th STREET TO THE HEFT STUDY

ALTERNATIVE 5

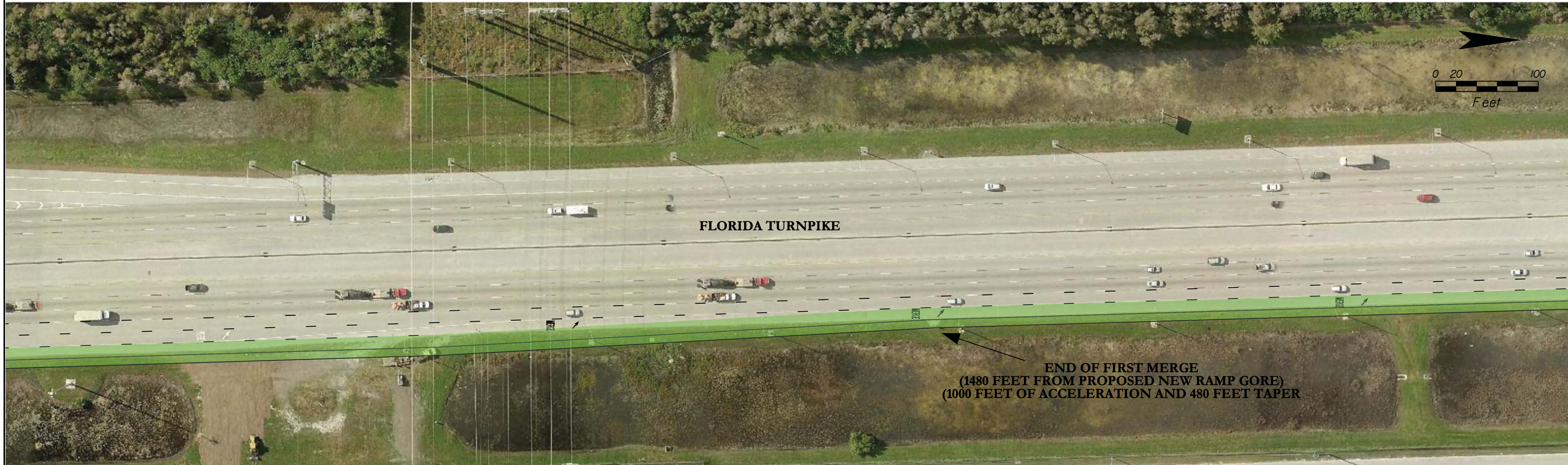
Miami-Dade
Metropolitan Planning Organization

MARLIN ENGINEERING

CONNECTING NW 25th STREET TO THE HEFT STUDY

ALTERNATIVE 5

Miami-Dade Metropolitan Planning Organization	MARLIN ENGINEERING	CONNECTING NW 25th STREET TO THE HEFT STUDY	ALTERNATIVE 6	1 of 2


0 20 100
Feet
FLORIDA TURNPIKE
END OF FIRST MERGE
(1480 FEET FROM PROPOSED NEW RAMP GORE)
(1000 FEET OF ACCELERATION AND 480 FEET TAPER

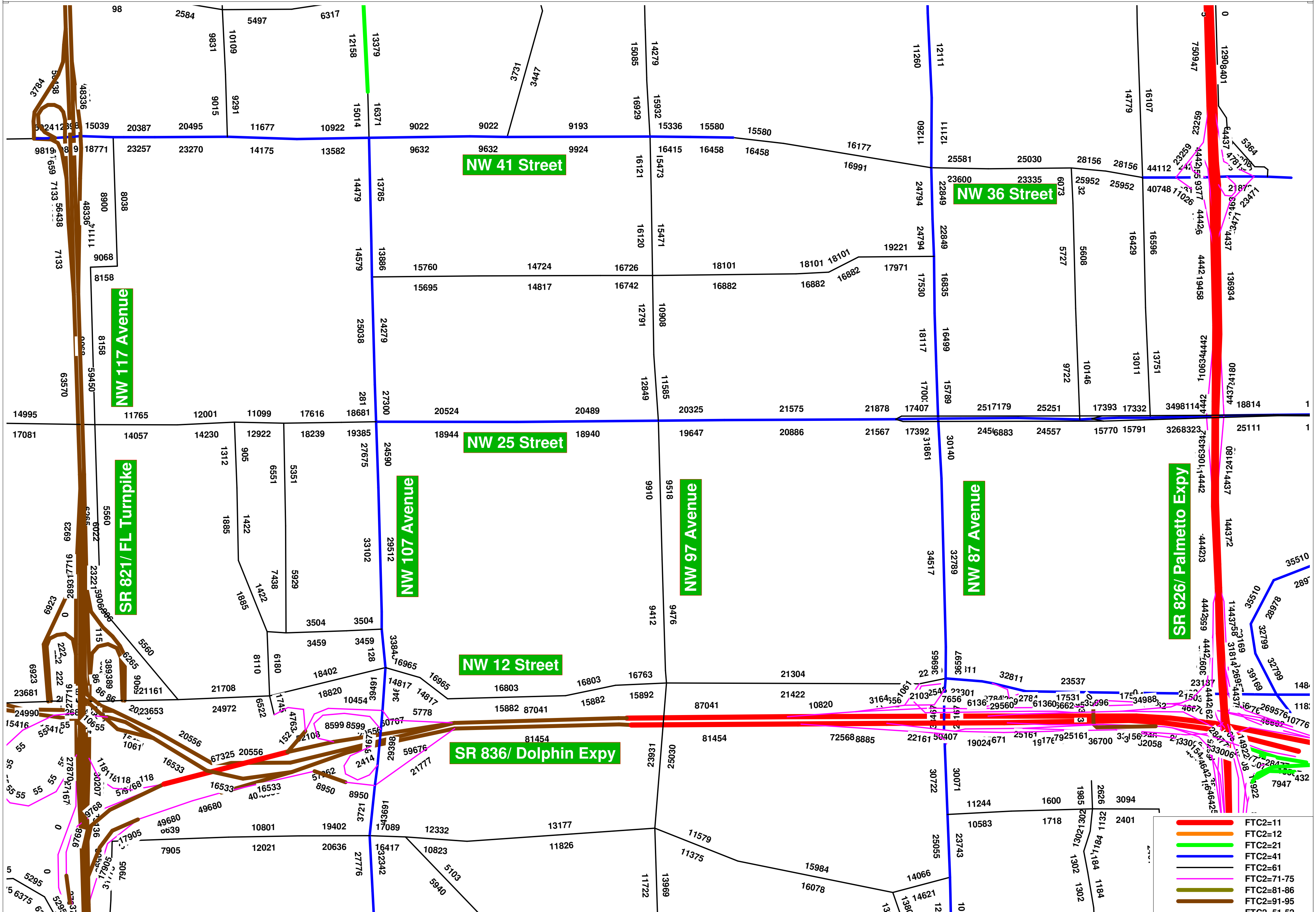

END OF SECOND MERGE
(1250 FEET FROM PREVIOUS MERGE)
(770 FEET OF ACCELERATION AND 480 FEET TAPER)
FLORIDA TURNPIKE
Legend
NEW CONSTRUCTION

Appendix H

Turnpike Model Runs Plots

No-Build

Connecting NW25th Street to the HEFT Study - Daily Volume - 2017 New Base



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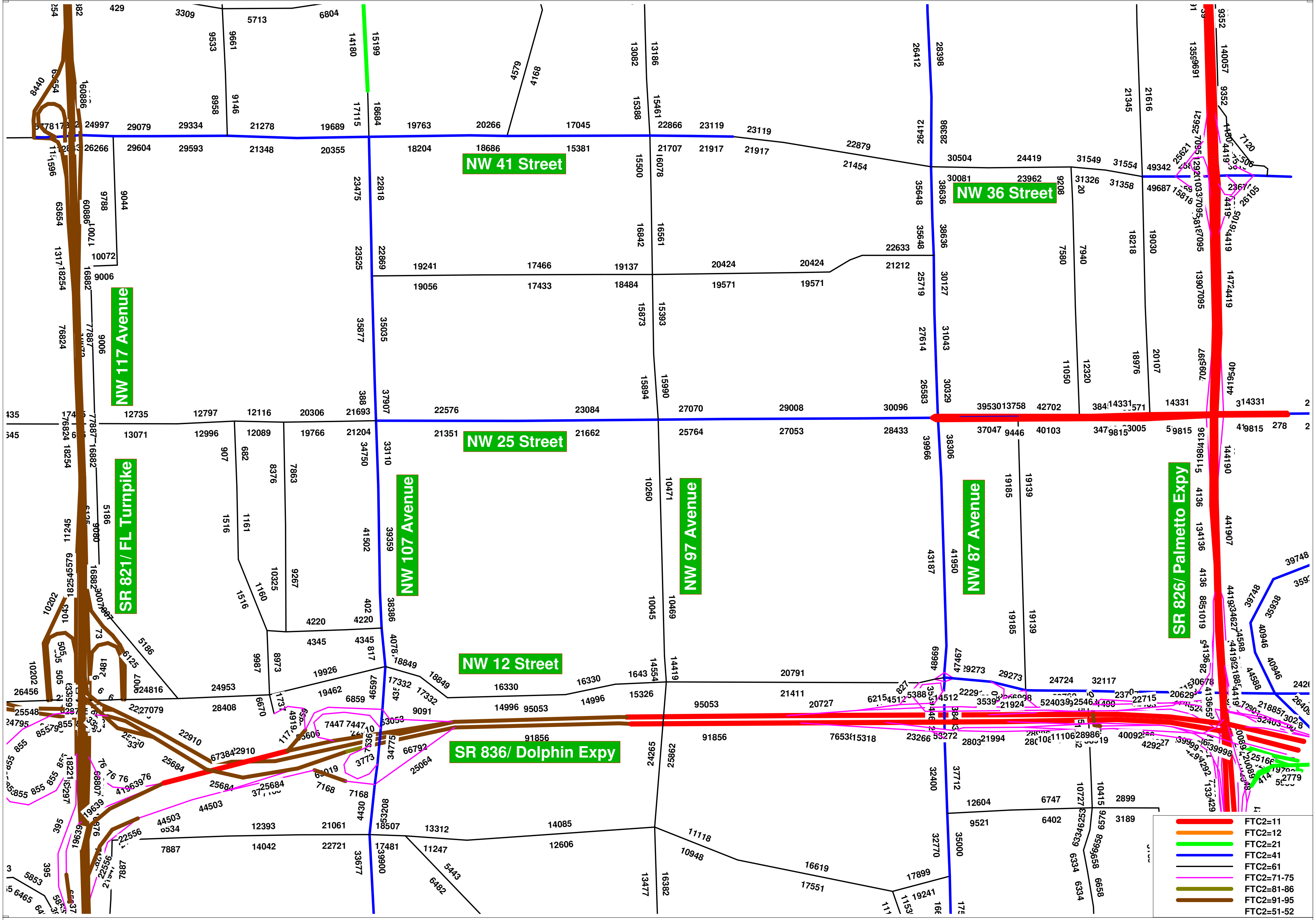
cube

Licensed to URS

Connecting NW25th Street to the HEFT Study - Daily Volume - 2030 New Base



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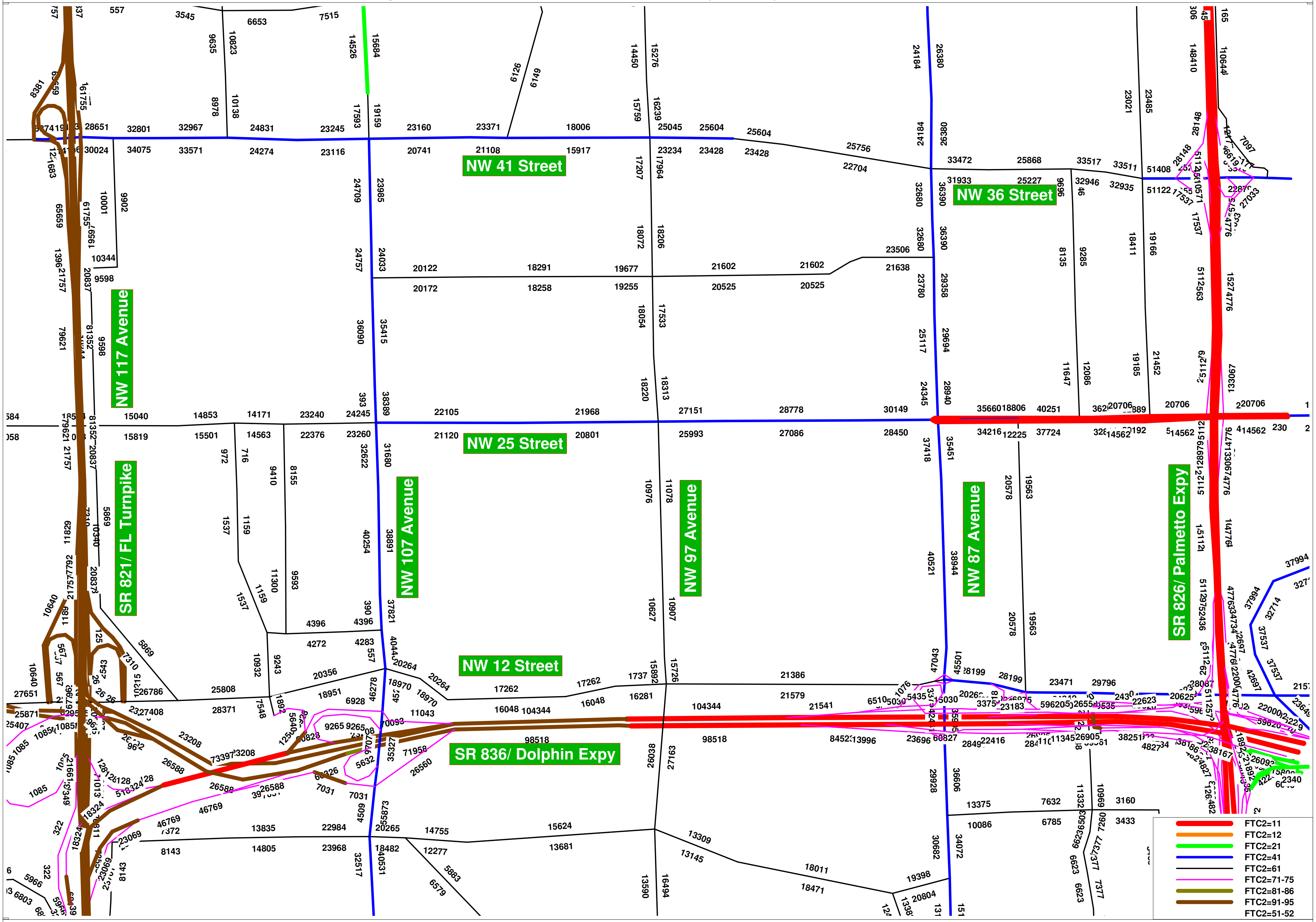
Connecting NW25th Street to the HEFT Study - Daily Volume - 2040 New Base



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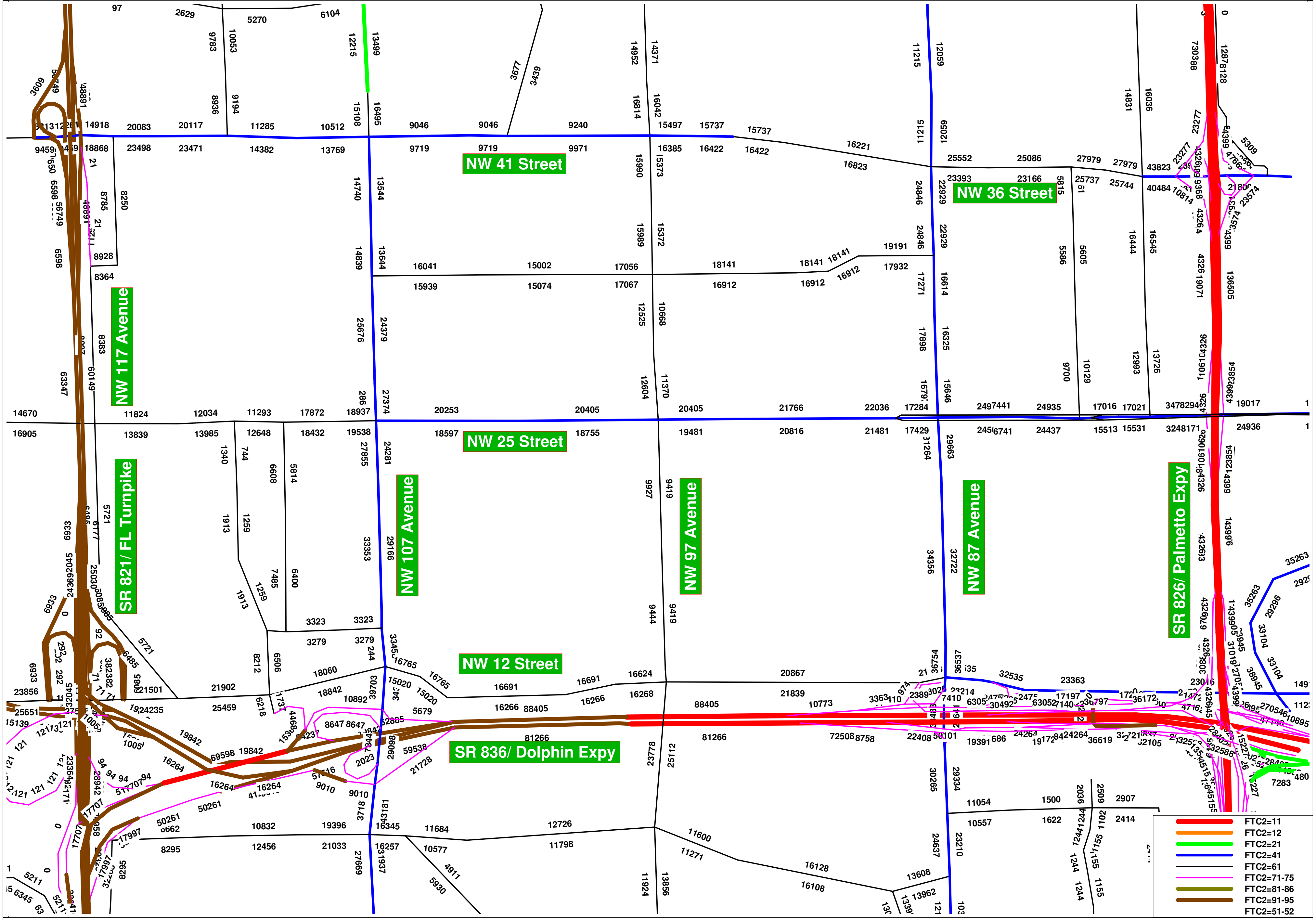
Alternative 5

Connecting NW25th Street to the HEFT Study - Daily Volume - 2017 Alt 5



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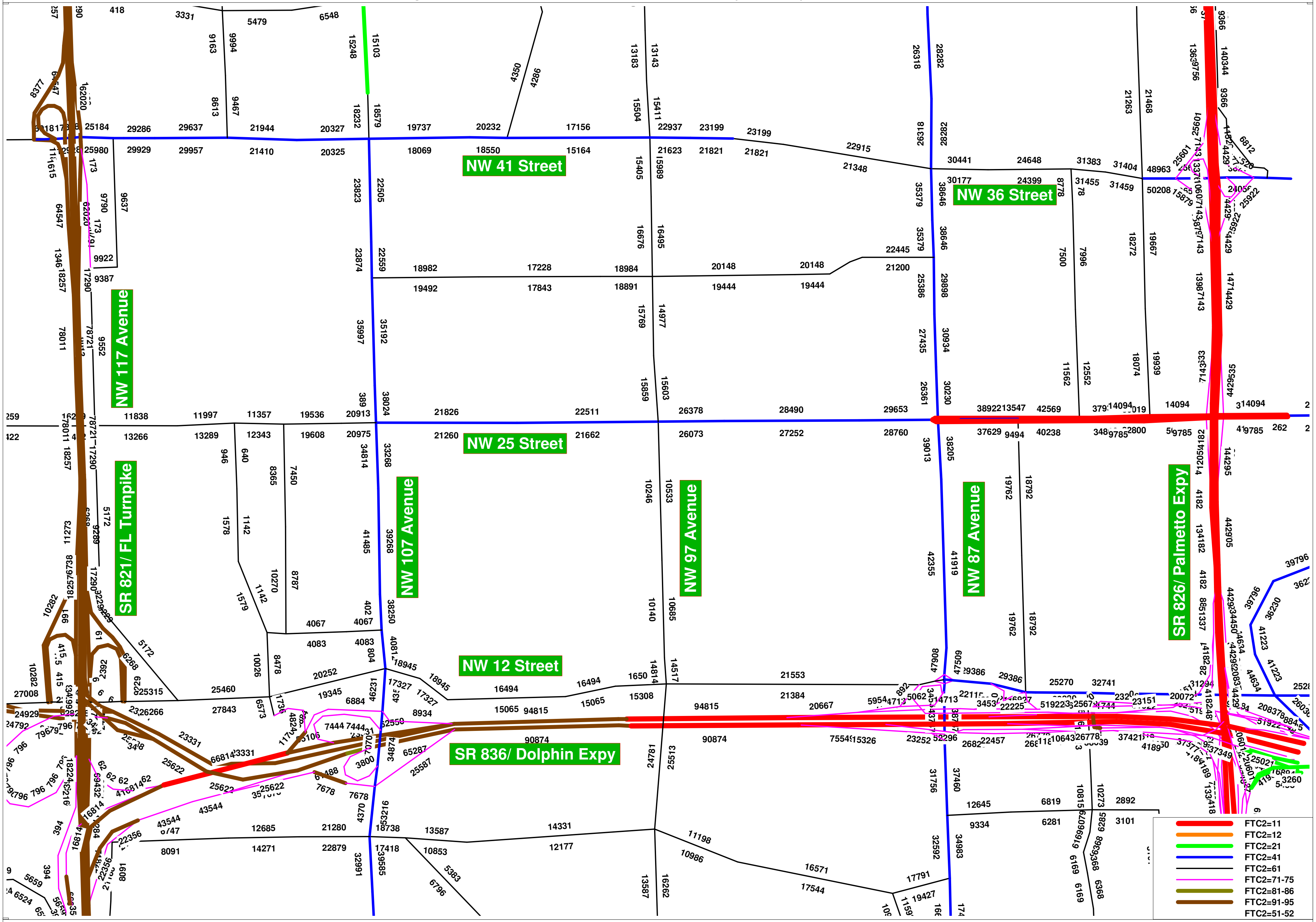
Connecting NW25th Street to the HEFT Study - Daily Volume - 2030 Alt 5



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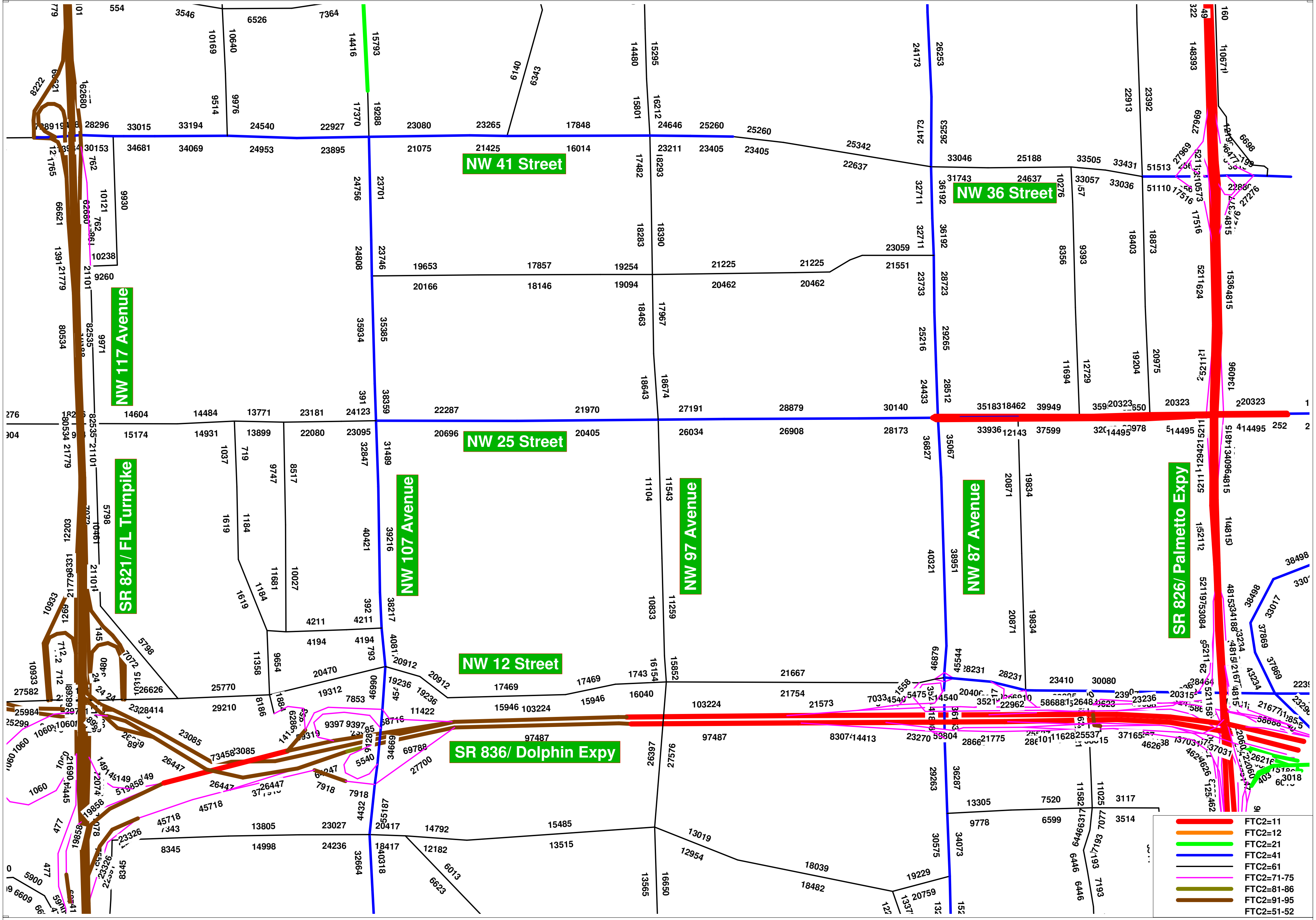
Connecting NW25th Street to the HEFT Study - Daily Volume - 2040 Alt 5



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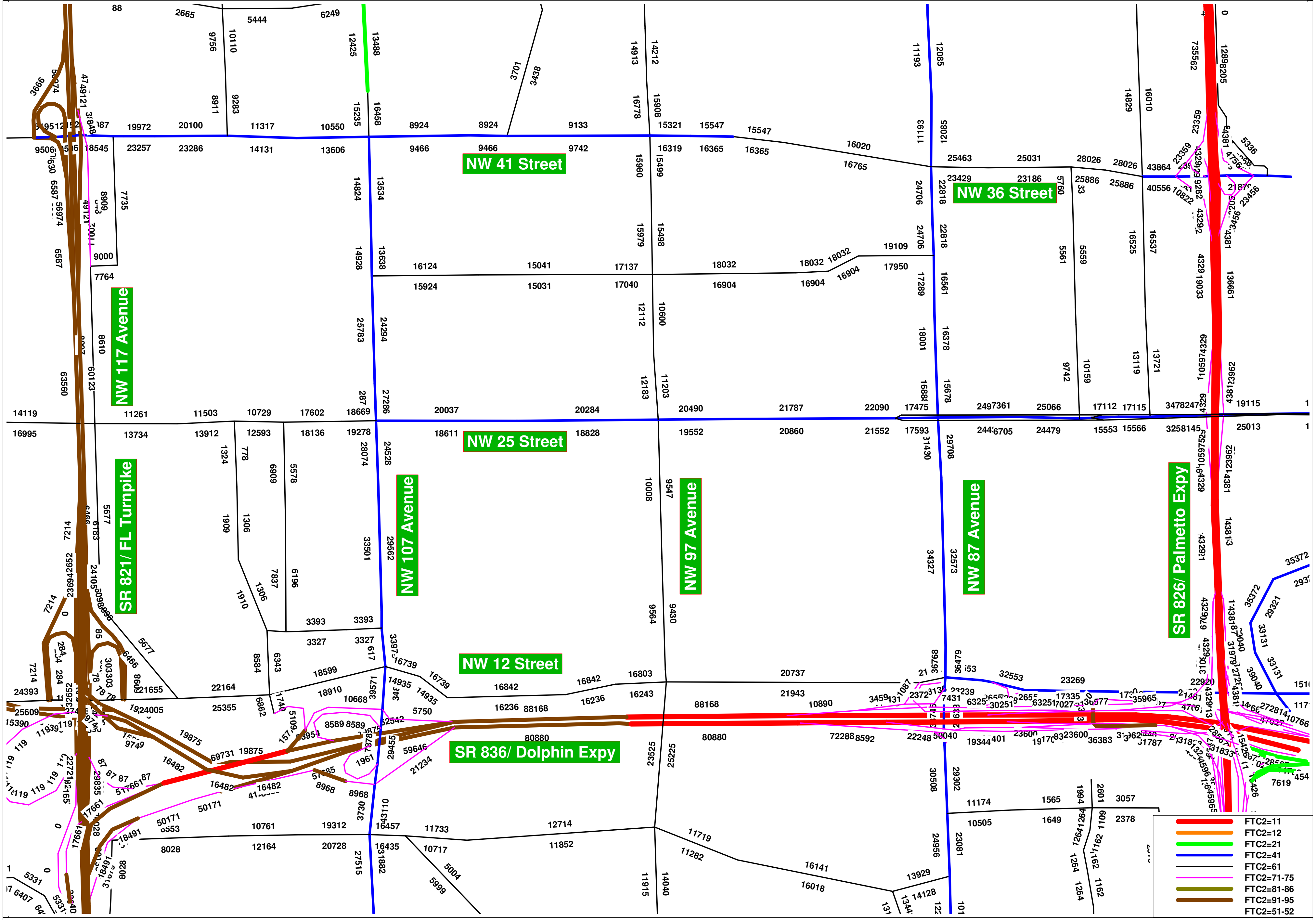
Alternative 6

Connecting NW25th Street to the HEFT Study - Daily Volume - 2017 Alt 6



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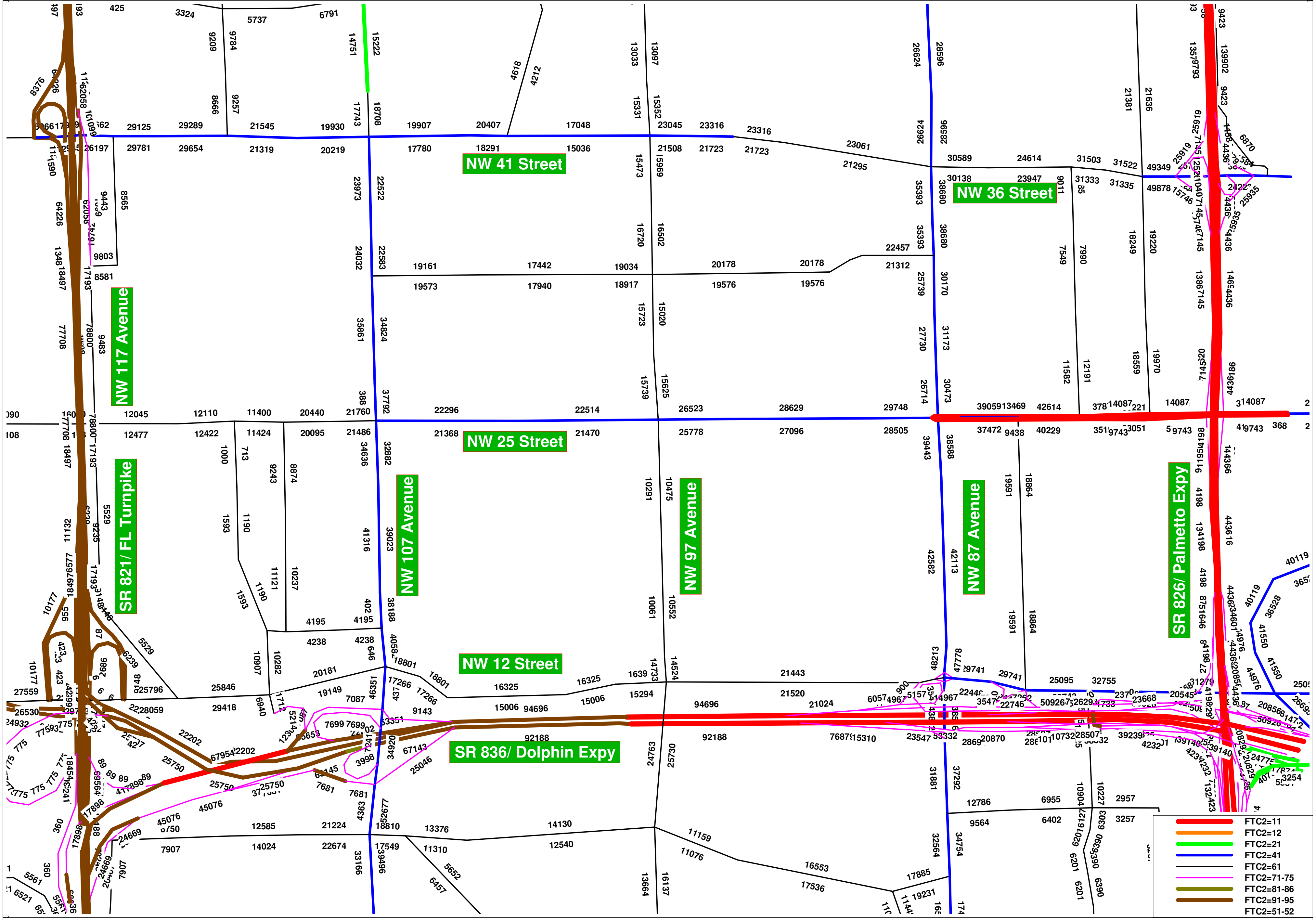
Connecting NW25th Street to the HEFT Study - Daily Volume - 2030 Alt 6



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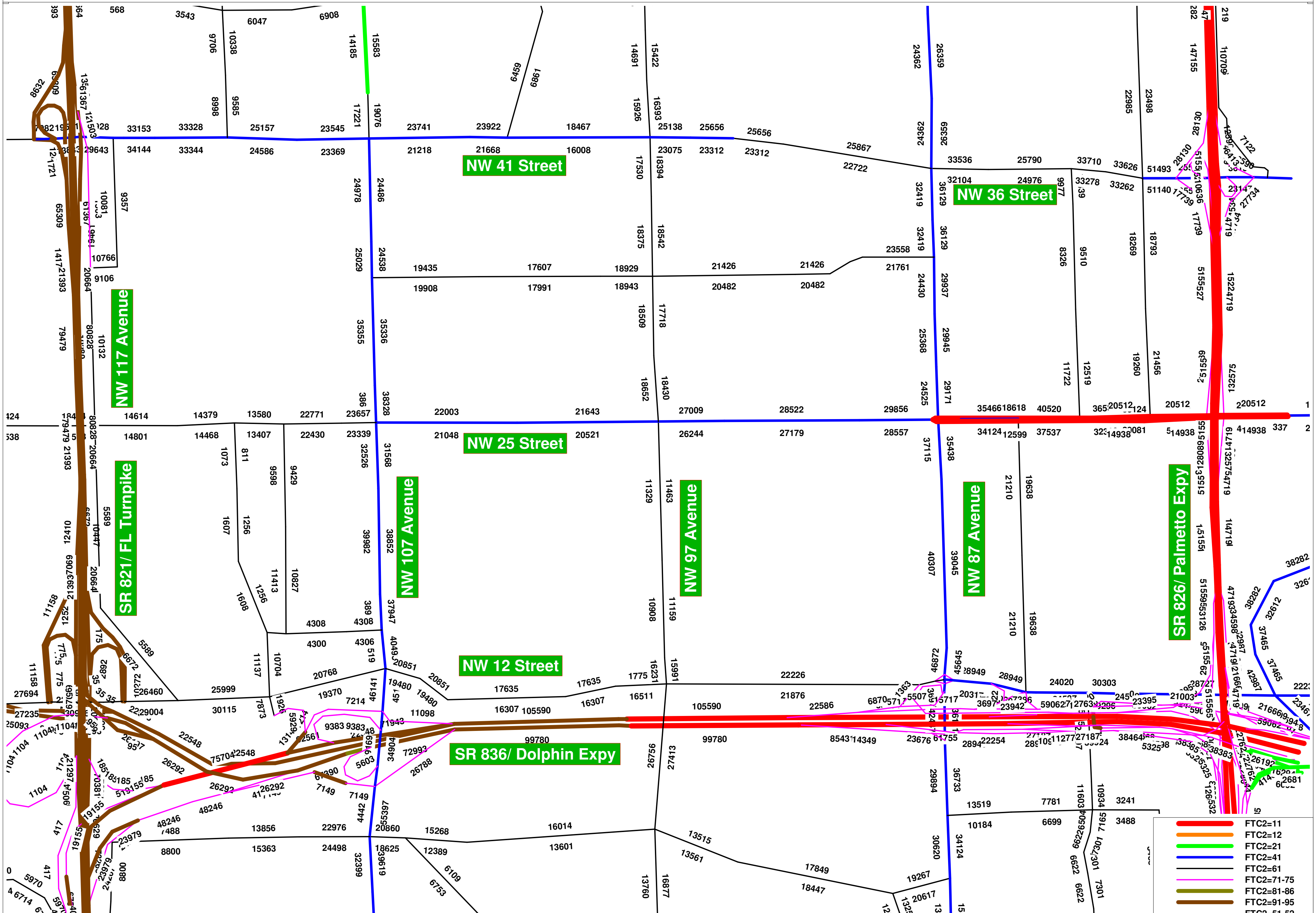
Connecting NW25th Street to the HEFT Study - Daily Volume - 2040 Alt 6



E:\PROJECTS\ICPP\HEFT_ML\Model Runs\Loaded Network\25thst connecting to HEFT flow maps\Combined_HLOAD_R40_Alt6.NET 12/11/2012

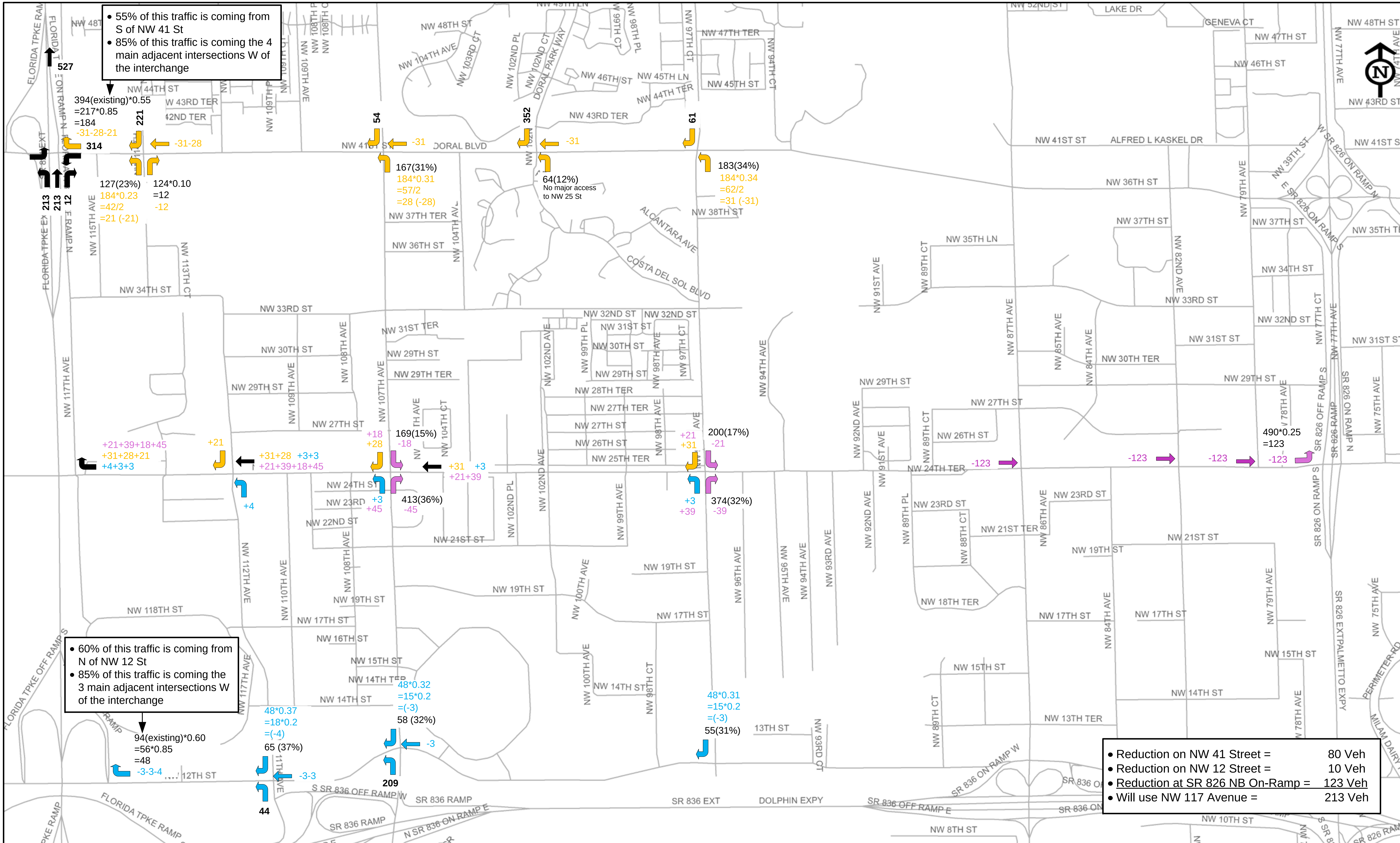
cube

Milepost - Description	Passenger Car Toll SunPa	Passenger Car Toll Cash	TEAR 2011 AADT	TEAR 2012 AADT	TEAR 2013 AADT	TEAR 2014 AADT	AET 2015 AADT	2016 AADT	2017 AADT	2018 AADT	2019 AADT	2020 AADT	2021 AADT	2022 AADT	2023 AADT	2024 AADT	2025 AADT	2026 AADT	2027 AADT	2028 AADT	2029 AADT	2030 AADT	2031 AADT	2032 AADT	2033 AADT	2034 AADT	2035 AADT	2036 AADT	2037 AADT	2038 AADT	2039 AADT	2040 AADT
HEFT																																
31 - NW 74th St.			3,100	3,100	2,900	3,000	3,100	3,200	3,300	3,400	3,500	3,600	3,700	3,800	3,900	4,000	4,100	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500	5,600
	$0.50		5,400	5,400	5,000	5,100	5,200	5,400	5,500	5,700	5,800	6,000	6,200	6,300	6,500	6,600	6,800	6,900	7,100	7,200	7,400	7,500	7,700	7,900	8,000	8,200	8,300	8,500	8,700	8,800	9,000	9,200
			97,000	97,400	92,000	93,100	94,300	96,700	99,100	101,600	104,100	106,700	109,000	111,300	113,700	116,100	118,600	121,100	123,700	126,300	129,000	131,700	134,500	137,400	140,300	143,300	146,300	149,400	152,600	155,800	159,100	162,500
29 - NW 41st St.			14,900	15,000	14,200	14,400	14,600	15,000	15,400	15,800	16,200	16,600	17,000	17,400	17,800	18,200	18,600	19,000	19,400	19,800	20,200	20,600	21,000	21,400	21,900	22,400	22,900	23,400	23,900	24,400	24,900	25,400
	$0.25	$0.25	15,800	15,900	15,100	15,200	15,300	15,700	16,100	16,500	17,000	17,400	17,900	18,400	18,900	19,400	19,900	20,400	20,900	21,500	22,000	22,600	23,100	23,600	24,300	24,900	25,600	26,300	27,000	27,700	28,400	29,100
			97,900	98,300	92,900	93,900	95,000	97,400	99,800	102,300	104,900	107,500	109,900	112,300	114,800	117,300	119,900	122,500	125,200	128,000	130,800	133,700	136,600	139,600	142,700	145,800	149,000	152,300	155,700	159,100	162,600	166,200
27 - NW 12th St. (Beacon Tradeport)			14,700	14,800	14,000	14,200	14,400	14,800	15,200	15,600	16,000	16,400	16,700	17,100	17,500	17,900	18,300	18,700	19,100	19,500	19,900	20,300	20,700	21,100	21,500	22,000	22,500	23,000	23,500	24,000	24,500	25,000
	$0.25	$0.25	10,200	10,200	9,600	9,800	9,900	10,200	10,500	10,800	11,000	11,300	12,100	13,000	13,900	14,900	15,900	17,000	18,100	19,200	20,400	21,600	22,900	24,200	25,500	27,000	28,500	30,000	31,600	33,300	35,000	36,700
			93,400	93,700	88,500	89,500	90,500	92,800	95,100	97,500	99,900	102,400	105,300	108,200	111,200	114,300	117,500	120,800	124,200	127,700	131,300	135,000	138,800	142,700	146,700	150,800	155,000	159,300	163,800	168,400	173,100	177,900
26 - SR 836 (Dolphin Expwy.)			13,800	13,800	13,000	13,100	13,300	13,600	13,900	14,200	14,600	15,000	15,300	15,600	15,900	16,200	16,500	16,900	17,300	17,700	18,100	18,500	18,900	19,300	19,700	20,100	20,500	20,900	21,300	21,800	22,300	22,800
			67,900	68,100	64,400	65,000	65,900	66,800	67,700	68,600	69,900	71,200	72,600	74,100	75,600	77,100	78,600	80,200	81,800	83,400	85,000	86,700	88,400	90,100	91,800	93,600	95,400	97,200	99,000	100,900	102,900	104,900
			147,500	148,000	139,900	141,400	143,100	146,000	148,900	151,900	155,200	158,600	162,600	166,700	170,900	175,200	179,600	184,100	188,700	193,400	198,200	203,200	208,300	213,500	218,800	224,300	229,900	235,600	241,500	247,500	253,700	260,000
25 - Tamiami Trail (US 41/SW 8th St.)	$0.25	$0.25	30,800	30,900	29,200	29,500	29,800	30,400	31,000	31,600	32,200	32,800	33,400	34,000	34,600	35,200	35,900	36,600	37,300	38,000	38,700	39,400	40,100	40,800	41,600	42,400	43,200	44,000	44,800	45,600	46,500	47,400
			16,100	16,200	15,300	15,500	15,600	15,900	16,200	16,500	16,800	17,100	17,200	17,300	17,400	17,500	17,700	17,900	18,100	18,300	18,500	18,600	18,700	18,800	19,000	19,100	19,200	19,300	19,400	19,500	19,600	19,800
			132,800	133,300	126,000	127,400	128,900	131,500	134,100	136,800	139,800	142,900	146,400	150,000	153,700	157,500	161,400	165,400	169,500	173,700	178,000	182,400	186,900	191,500	196,200	201,000	205,900	210,900	216,100	221,400	226,800	232,400
23 - Bird Rd. (SW 40th St.)	$0.25	$0.50	29,000	29,100	27,500	27,800	28,100	28,700	29,300	29,900	30,500	31,100	31,700	32,300	32,900	33,500	34,100	34,700	35,300	36,000	36,700	37,400	38,100	38,800	39,500	40,200	40,900	41,700	42,500	43,300	44,100	44,900
			15,800	15,800	14,900	15,000	15,100	15,400	15,800	16,100	16,200	16,200	16,400	16,600	16,800	17,000	17,200	17,300	17,400	17,600	17,800	18,000	18,200	18,400	18,600	18,800	19,000	19,300	19,500	19,700	19,900	20,100
22 - BIRD ROAD PLAZA	$0.75	$1.00	119,600	120,000	113,400	114,600	115,900	118,200	120,600	123,000	125,500	128,000	131,100	134,300	137,600	141,000	144,500	148,000	151,600	155,300	159,100	163,000	167,000	171,100	175,300	179,600	184,000	188,500	193,100	197,800	202,600	207,600
20 - Kendall Dr. (SW 88th St.)			37,100	37,200	35,200	35,600	36,000	36,700	37,400	38,100	38,900	39,700	40,400	41,100	41,900	42,700	43,500	44,300	45,100	45,900	46,700	47,600	48,500	49,400	50,300	51,200	52,100	53,100	54,100	55,100	56,100	57,100
	$0.25	$0.50	18,100	18,100	17,200	17,500	17,700	18,100	18,400	18,700	19,100	19,500	19,700	19,800	20,000	20,200	20,300	20,500	20,700	20,900	21,000	21,200	21,400	21,600	21,700	21,800	21,900	22,100	22,300	22,500	22,700	22,800
			100,600	100,900	95,400	96,500	97,600	99,600	101,600	103,600	105,700	107,800	110,400	113,000	115,700	118,500	121,300	124,200	127,200	130,300	133,400	136,600	139,900	143,300	146,700	150,200	153,800	157,500	161,300	165,200	169,200	173,300
19 - Snapper Creek Service Area			20,400	20,500	19,400	19,600	19,800	20,200	20,600	21,000	21,400	21,900	22,300	22,700	23,100	23,500	23,900	24,300	24,700	25,200	25,700	26,200	26,700	27,200	27,700	28,200	28,700	29,200	29,700	30,200	30,800	31,400
19 - SW 120th St.	$0.25	$0.50	11,500	11,600	10,900	11,000	11,200	11,400	11,600	11,900	12,100	12,400	12,500	12,700	12,800	12,900	13,000	13,100	13,200	13,300	13,500	13,600	13,700	13,800	14,000	14,100	14,200	14,300	14,400	14,400	14,500	14,600
			91,700	92,000	86,900	87,900	89,000	90,800	92,600	94,500	96,400	98,300	100,600	103,000	105,400	107,900	110,400	113,000	115,700	118,400	121,200	124,000	126,900	129,900	133,000	136,100	139,300	142,600	146,000	149,400	152,900	156,500
17 - Don Shula Expwy. (SR 874)			72,700	73,000	69,000	69,700	70,400	71,800	73,300	74,700	76,200	54,900	56,300	57,700	59,200	60,700	62,200	63,700	65,200	66,800	68,400	70,200	72,000	73,800	75,600	77,500	79,400	81,300	83,300	85,400	87,500	89,700
			164,400	165,000	155,900	157,600	159,400	162,600	165,900	169,200	172,600	153,200	156,900	160,700	164,600	168,600	172,600	176,700	180,900	185,200	189,600	194,200	198,900	203,700	208,600	213,600	218,700	223,900	229,300	234,800	240,400	246,200
16 - Coral Reef Dr. (SW 152nd St. & SW 117th Ave.)			39,600	39,700	37,500	37,900	38,300	39,100	39,900	40,700	41,500	19,000	19,400	19,800	20,200	20,600	21,000	21,400	21,800	22,200	22,600	23,100	23,600	24,100	24,600	25,100	25,600	26,100	26,600	27,100	27,600	28,200
	$0.25	$0.25	13,000	13,000	12,300	12,400	12,500	12,800	13,000	13,300	13,500	13,300	13,500	13,700	13,900	14,100	14,400	14,700	15,000	15,300	15,600	15,900	16,200	16,500	16,800	17,100	17,400	17,800	18,100	18,400	18,700	19,100
			137,800	138,300	130,700	132,100	133,600	136,300	139,000	141,800	144,600	147,500	151,000	154,600	158,300	162,100	166,000	170,000	174,100	178,300	182,600	187,000	191,500	196,100	200,800	205,600	210,500	215,600	220,800	226,100	231,500	237,100
13 - Quail Roost Dr. (Eureka Drive)			38,900	39,000	36,900	37,300	37,700	38,500	39,300	40,100	40,900	41,700	42,500	43,300	44,100	44,900	45,700	46,500	47,400	48,300	49,200	50,100	51,000	51,900	52,900	53,900	54,900	55,900	56,900	57,900	59,000	60,100
			15,800	15,800	15,000	15,200	15,400	15,700	16,100	16,400	16,800	17,100	17,300	17,500	17,700	17,900	18,000	18,100	18,300	18,500	18,700	18,900	19,000	19,100	19,300	19,500	19,700	19,800	19,900	20,000	20,200	20,300
			114,700	115,100	108,800	110,000	111,300	113,500	115,800	118,100	120,500	122,900	125,800	128,800	131,900	135,100	138,300	141,600	145,000	148,500	152,100	155,800	159,500	163,300	167,200	171,200	175,300	179,500	183,800	188,200	192,700	197,300
12 - Caribbean Blvd. (US 1)/Government Center			51,000	51,200	48,400	48,900	49,500	50,500	51,500	52,500	53,600	54,700	55,700	56,700	57,800	58,900	60,000	61,100	62,200	63,400	64,600	65,800	67,000	68,200	69,500	70,800	72,100	73,400	74,800	76,200	77,600	79,000
11- Hainlin Mill Dr. (SW 216th St.)			11,400	11,500	10,900	11,000	11,100	12,800	14,500	16,400	18,400	20,500	20,700	20,900	21,100	21,300	21,500	21,700	21,900	22,100	22,300	22,400	22,600	22,800	23,000	23,200	23,400	23,500	23,700	23,900	24,100	24,200
10 - HOMESTEAD PLAZA	$0.75	$1.00	75,100	75,400	71,300	72,100	72,900	75,800	78,800	82,000	85,300	88,700	90,800	93,000	95,200	97,500	99,800	102,200	104,700	107,200	109,800	112,400	115,100	117,900	120,700	123,600	126,600	129,600	132,700	135,900	139,200	142,500
9 - Allapattah Rd. (SW 112th Avenue)			7,000	7,000	6,600	6,700	6,800	7,100	7,400	7,700	8,000	8,300	8,500	8,700	8,900	9,100	9,300	9,500	9,700	9,900	10,100	10,400	10,700	11,000	11,300	11,600	11,900	12,200	12,500	12,800	13,100	13,400
	$0.50	$0.75	3,800	3,800	3,500	3,600	3,800	4,000	4,200	4,300	4,400	4,600	4,700	4,700	4,800	4,800	4,900	4,900	4,900	4,900	4,900	5,100	5,200	5,300	5,400	5,500	5,600	5,700	5,800	5,900	5,900	6,000
			71,900	72,200	68,200	69,000	69,900	72,700	75,600	78,600	81,700	85,000	87,000	89,000	91,100	93,200	95,400	97,600	99,900	102,200	104,600	107,100	109,600	112,200	114,800	117,500	120,300	123,100	126,000	129,000	132,000	135,100
6 - Tallahassee Rd. (SW 137th Ave.)			11,200	11,300	10,600	10,800	11,000	11,400	11,800	12,200	12,600	13,100	13,400	13,700	14,000	14,400	14,800	15,200	15,600	16,000	16,400	16,800	17,200	17,600	18,000	18,500	19,000	19,500	20,000	20,500	21,000	21,500
			60,700	60,900	57,600	58,200	58,900	61,300	63,800	66,400	69,100	71,900	73,600	75,300	77,100	78,800	80,600	82,400	84,300	86,200	88,200	90,300	92,400	94,600	96,800	99,000	101,300	103,600	106,000	108,500	111,000	113,600
5 - Biscayne Dr. (SW 288th St.)			11,600	11,600	11,000	11,100	11,200	11,600	12,100	12,600	13,100	13,600	13,900	14,200	14,600	15,000	15,400	15,800	16,200	16,600	17,000	17,400	17,800	18,200	18,700	19,200	19,700	20,200	20,700	21,200	21,700	22,200
	$0.25	$0.50	3,600	3,600	3,400	3,500	3,600	3,800	4,000	4,200	4,300	4,500	4,700	4,900	5,200	5,600	5,900	6,300	6,600	7,000	7,300	7,600	7,900	8,200	8,600	9,100	9,500	10,000	10,400	10,800	11,300	11,700
			52,700	52,900	50,000	50,600	51,300	53,500	55,700	58,000	60,300	62,800	64,400	66,000	67,700	69,400	71,100	72,900	74,700	76,600	78,500	80,500	82,500	84,600	86,700	88,900	91,100	93,400	95,700	98,100	100,600	103,100
2 - Campbell Dr. (SW 312th St.)			20,900	21,000	19,800	20,000	20,200	21,000	21,800	22,700	23,600	24,500	25,100	25,700	26,300	27,000	27,700	28,400	29,100	29,800	30,500	31,300	32,100	32,900	33,700	34,500	35,400	36,300	37,200	38,100	39,100	40,100
	$0.25	$0.25	3,300	3,300	3,100	3,200	3,300	3,400	3,500	3,600	3,800	3,800	4,000	4,300	4,500	4,800	5,200	5,500	5,900	6,200	6,600	7,000	7,400	7,800	8,200	8,600	9,100	9,600	10,200	10,700	11,300	11,900
0 - US 1 (S. Dixie Hwy.)			35,100	35,200	33,300	33,800	34,400	35,900	37,400	38,900	40,500	42,100	43,300	44,600	45,900	47,200	48,600	50,000	51,500	53,000	54,600	56,200	57,800	59,500	61,200	63,000	64,800	66,700	68,700	70,700	72,800	74,900

Appendix I

SR 821/HEFT NB On-Ramp

Volumes Attraction and Distribution

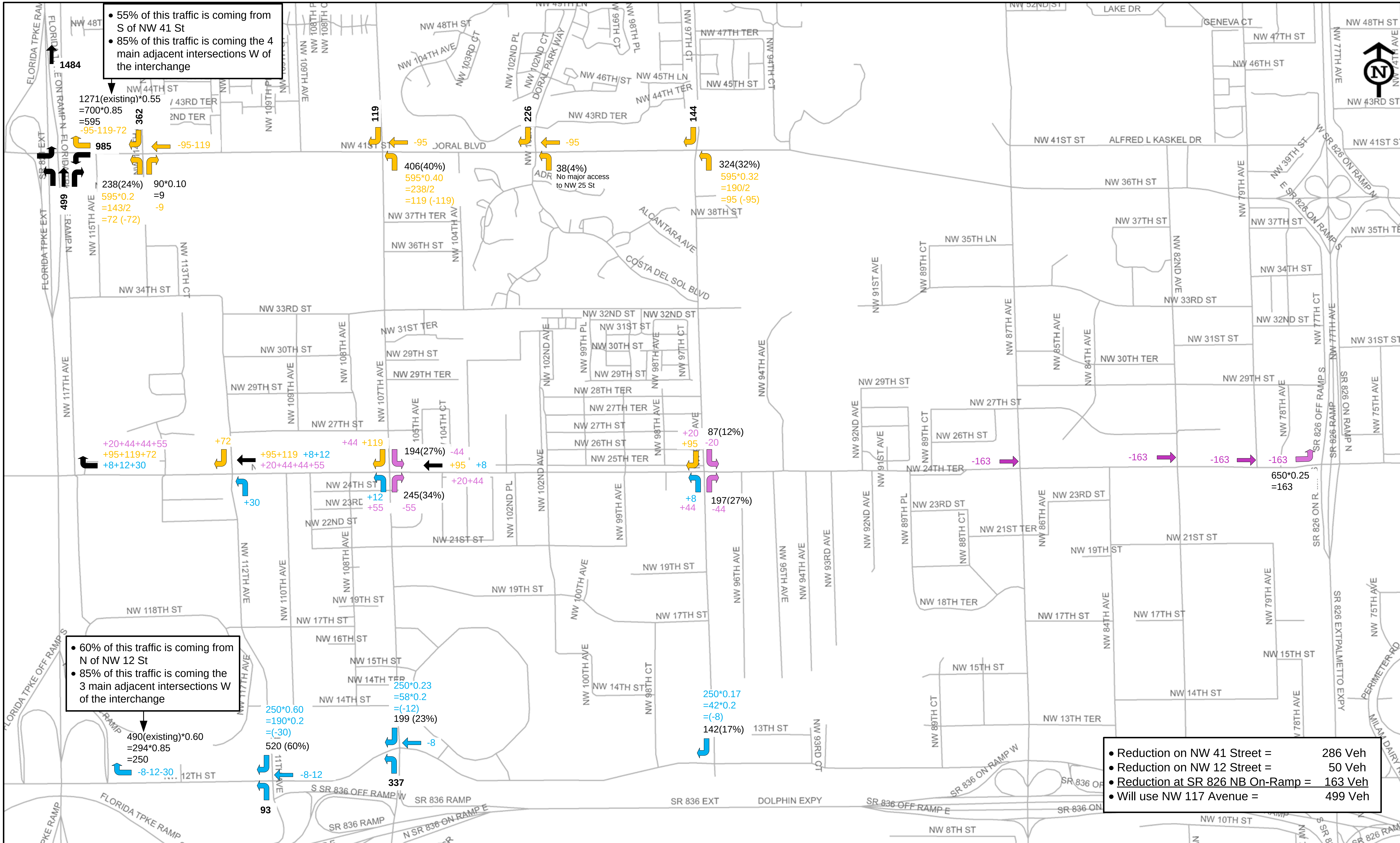


AM Estimated Trip WB Distribution

Trips from WB NW 12 Street

Trips from NW 41 Street

Trips from NW 25 Street (from Palmetto Expwy)



PM Estimated Trip WB Distribution

Trips from WB NW 12 Street

Trips from NW 41 Street

Trips from NW 25 Street (from Palmetto Expwy)

MARLIN ENGINEERING

Appendix J

2040 Capacity Analysis for

No-Build, 5A and 6A Alternatives

No-Build

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	73	35	3	15	0	0	0	0	503	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0					5.0		4.0
Lane Util. Factor		0.95			1.00					0.94		1.00
Frt		0.95			1.00					1.00		0.85
Flt Protected		1.00			0.99					0.95		1.00
Satd. Flow (prot)		2734			1676					4545		944
Flt Permitted		1.00			0.96					0.95		1.00
Satd. Flow (perm)		2734			1626					4545		944
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	0	136	65	6	28	0	0	0	0	940	0	13
RTOR Reduction (vph)	0	31	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	170	0	0	34	0	0	0	0	940	0	13
Heavy Vehicles (%)	2%	3%	73%	0%	15%	3%	0%	0%	0%	12%	0%	71%
Turn Type				Perm						custom		Free
Protected Phases		6			2							
Permitted Phases				2						4		Free
Actuated Green, G (s)		32.9			32.9					20.1		63.0
Effective Green, g (s)		32.9			32.9					20.1		63.0
Actuated g/C Ratio		0.52			0.52					0.32		1.00
Clearance Time (s)		5.0			5.0					5.0		
Vehicle Extension (s)		3.0			3.0					3.0		
Lane Grp Cap (vph)		1428			849					1450		944
v/s Ratio Prot		c0.06										
v/s Ratio Perm					0.02					c0.21		0.01
v/c Ratio		0.12			0.04					0.65		0.01
Uniform Delay, d1		7.7			7.3					18.4		0.0
Progression Factor		1.00			1.00					1.00		1.00
Incremental Delay, d2		0.2			0.1					1.0		0.0
Delay (s)		7.8			7.4					19.4		0.0
Level of Service		A			A					B		A
Approach Delay (s)		7.8			7.4			0.0			19.2	
Approach LOS		A			A			A			B	

Intersection Summary			
HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	63.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	490	0	0	1114	1271	14	0	507	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0			5.0	4.0	5.0		5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		0.76			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1805	3223			3574	1568	1805		3646			
Flt Permitted	0.07	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	140	3223			3574	1568	1805		3646			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	81	868	0	0	1973	2251	25	0	898	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	623	0	0	0
Lane Group Flow (vph)	81	868	0	0	1973	2251	25	0	275	0	0	0
Heavy Vehicles (%)	0%	12%	0%	0%	1%	3%	0%	0%	1%	0%	0%	0%
Turn Type	pm+pt					Free	Prot		custom			
Protected Phases	1	6			2		4					
Permitted Phases	6					Free			4			
Actuated Green, G (s)	138.0	138.0			128.6	160.0	12.0		12.0			
Effective Green, g (s)	138.0	138.0			128.6	160.0	12.0		12.0			
Actuated g/C Ratio	0.86	0.86			0.80	1.00	0.08		0.08			
Clearance Time (s)	3.0	5.0			5.0		5.0		5.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	187	2780			2873	1568	135		273			
v/s Ratio Prot	0.02	0.27			0.55		0.01					
v/s Ratio Perm	0.36					c1.44			0.08			
v/c Ratio	0.43	0.31			0.69	1.44	0.19		1.01			
Uniform Delay, d1	10.3	2.1			6.9	80.0	69.4		74.0			
Progression Factor	1.00	1.00			1.91	1.00	1.00		1.00			
Incremental Delay, d2	1.6	0.3			0.1	196.4	3.0		56.8			
Delay (s)	11.9	2.4			13.3	276.4	72.4		130.8			
Level of Service	B	A			B	F	E		F			
Approach Delay (s)		3.2			153.5			129.2			0.0	
Approach LOS		A			F			F			A	

Intersection Summary			
HCM Average Control Delay	126.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.44		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	159	821	195	268	1936	78	174	3	237	20	1	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.85		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	4939		1770	5056		1770	1587		1770	1593	
Flt Permitted	0.05	1.00		0.05	1.00		0.59	1.00		0.19	1.00	
Satd. Flow (perm)	99	4939		94	5056		1097	1587		355	1593	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	294	1517	360	495	3577	144	322	6	438	37	2	55
RTOR Reduction (vph)	0	24	0	0	3	0	0	237	0	0	48	0
Lane Group Flow (vph)	294	1853	0	495	3718	0	322	207	0	37	9	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	97.0	75.0		110.0	84.0		42.0	34.8		24.2	21.0	
Effective Green, g (s)	97.0	75.0		110.0	84.0		42.0	34.8		24.2	21.0	
Actuated g/C Ratio	0.61	0.47		0.69	0.52		0.26	0.22		0.15	0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	290	2315		389	2654		359	345		82	209	
v/s Ratio Prot	0.14	0.38		c0.25	c0.74		c0.10	0.13		0.01	0.01	
v/s Ratio Perm	0.47			0.63			c0.14			0.06		
v/c Ratio	1.01	0.80		1.27	1.40		0.90	0.60		0.45	0.04	
Uniform Delay, d1	56.8	36.1		55.1	38.0		55.3	56.3		59.8	60.7	
Progression Factor	0.98	1.04		0.83	1.28		1.00	1.00		1.00	1.00	
Incremental Delay, d2	52.3	1.8		124.5	180.6		23.8	7.5		3.9	0.4	
Delay (s)	107.7	39.4		170.0	229.2		79.1	63.8		63.7	61.1	
Level of Service	F	D		F	F		E	E		E	E	
Approach Delay (s)		48.7			222.3			70.3			62.1	
Approach LOS		D			F			E			E	

Intersection Summary			
HCM Average Control Delay	152.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	119.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	208	951	64	248	1667	220	238	225	90	171	267	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	5.0
Lane Util. Factor	0.97	0.91		1.00	0.91		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4919		1752	5002		1703	1776		1805	1881	1599
Flt Permitted	0.95	1.00		0.07	1.00		0.17	1.00		0.19	1.00	1.00
Satd. Flow (perm)	3433	4919		132	5002		299	1776		362	1881	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	368	1684	113	439	2952	390	421	398	159	303	473	641
RTOR Reduction (vph)	0	5	0	0	11	0	0	9	0	0	0	99
Lane Group Flow (vph)	368	1792	0	439	3332	0	421	548	0	303	473	542
Heavy Vehicles (%)	2%	3%	26%	3%	2%	1%	6%	1%	6%	0%	1%	1%
Turn Type	Prot			pm+pt			pm+pt			pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases				6			8			4		4
Actuated Green, G (s)	12.0	90.0		102.0	90.0		45.0	29.0		34.0	21.0	21.0
Effective Green, g (s)	12.0	90.0		102.0	90.0		45.0	29.0		34.0	21.0	21.0
Actuated g/C Ratio	0.08	0.56		0.64	0.56		0.28	0.18		0.21	0.13	0.13
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	257	2767		206	2814		268	322		194	247	210
v/s Ratio Prot	0.11	0.36		c0.16	0.67		c0.21	0.31		0.13	0.25	
v/s Ratio Perm				c1.20			0.24			0.20		c0.34
v/c Ratio	1.43	0.65		2.13	1.18		1.57	1.70		1.56	1.91	2.58
Uniform Delay, d1	74.0	24.1		41.1	35.0		50.9	65.5		58.7	69.5	69.5
Progression Factor	1.02	0.94		1.18	1.24		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	209.0	0.8		510.5	83.1		274.2	328.8		276.4	426.5	725.1
Delay (s)	284.8	23.5		558.8	126.5		325.1	394.3		335.1	496.0	794.6
Level of Service	F	C		F	F		F	F		F	F	F
Approach Delay (s)		67.9			176.7			364.5			596.7	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	241.8	HCM Level of Service	F
HCM Volume to Capacity ratio	2.09		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	135.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	243	259	1959	163	136	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0		7.0	7.0
Lane Util. Factor	1.00	1.00	0.91		0.97	0.91
Frt	1.00	1.00	0.99		0.93	0.85
Flt Protected	0.95	1.00	1.00		0.97	1.00
Satd. Flow (prot)	1805	1863	5034		3288	1455
Flt Permitted	0.09	1.00	1.00		0.97	1.00
Satd. Flow (perm)	173	1863	5034		3288	1455
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	439	468	3543	295	246	434
RTOR Reduction (vph)	0	0	12	0	108	108
Lane Group Flow (vph)	439	468	3826	0	355	109
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%
Turn Type	pm+pt					Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	50.0	50.0	41.0		18.0	18.0
Effective Green, g (s)	50.0	50.0	41.0		18.0	18.0
Actuated g/C Ratio	0.62	0.62	0.51		0.22	0.22
Clearance Time (s)	3.0	5.0	5.0		7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	231	1164	2580		740	327
v/s Ratio Prot	c0.14	0.25	0.76		c0.11	
v/s Ratio Perm	c1.05					0.08
v/c Ratio	1.90	0.40	1.48		0.48	0.33
Uniform Delay, d1	22.6	7.5	19.5		26.9	26.0
Progression Factor	2.45	1.76	1.31		1.00	1.00
Incremental Delay, d2	415.0	0.6	217.5		2.2	2.7
Delay (s)	470.3	13.9	243.1		29.2	28.7
Level of Service	F	B	F		C	C
Approach Delay (s)		234.8	243.1		29.0	
Approach LOS		F	F		C	

Intersection Summary			
HCM Average Control Delay	214.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.47		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	117.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	168	677	201	429	1456	191	406	578	219	152	573	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	0.91		0.97	0.91		0.91	0.91	1.00	0.91	0.91	
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1787	4841		3367	4991		1579	3389	1524	1595	3301	
Flt Permitted	0.08	1.00		0.95	1.00		0.95	0.99	1.00	0.95	1.00	
Satd. Flow (perm)	154	4841		3367	4991		1579	3389	1524	1595	3301	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	291	1174	349	744	2526	331	704	1003	380	264	994	206
RTOR Reduction (vph)	0	33	0	0	10	0	0	0	135	0	10	0
Lane Group Flow (vph)	291	1490	0	744	2847	0	556	1151	245	238	1216	0
Heavy Vehicles (%)	1%	3%	5%	4%	2%	3%	4%	1%	6%	3%	2%	2%
Turn Type	pm+pt			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases	6								4			
Actuated Green, G (s)	69.0	49.0		20.0	49.0		33.0	33.0	33.0	37.0	37.0	
Effective Green, g (s)	69.0	49.0		20.0	49.0		33.0	33.0	33.0	37.0	37.0	
Actuated g/C Ratio	0.43	0.31		0.12	0.31		0.21	0.21	0.21	0.23	0.23	
Clearance Time (s)	3.0	6.0		3.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	271	1483		421	1528		326	699	314	369	763	
v/s Ratio Prot	0.13	0.31		c0.22	c0.57		c0.35	0.34		0.15	c0.37	
v/s Ratio Perm	0.33								0.16			
v/c Ratio	1.07	1.00		1.77	1.86		1.71	1.65	0.78	0.64	1.59	
Uniform Delay, d1	52.1	55.5		70.0	55.5		63.5	63.5	60.1	55.6	61.5	
Progression Factor	1.00	1.42		0.93	1.46		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	67.2	20.8		346.1	388.6		330.3	297.4	11.9	3.8	273.4	
Delay (s)	119.2	99.7		411.5	469.5		393.8	360.9	71.9	59.4	334.9	
Level of Service	F	F		F	F		F	F	E	E	F	
Approach Delay (s)		102.9			457.5			317.1			290.1	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	325.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.74		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	148.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	216	1171	82	77	1872	220	38	27	51	125	46	226
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0			5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00	0.97	0.95	0.95
Frt	1.00	0.99		1.00	0.98			1.00	0.85	1.00	0.90	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	4993		1805	5060			1846	1583	3502	1603	1504
Flt Permitted	0.95	1.00		0.95	1.00			0.68	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	4993		1805	5060			1293	1583	3502	1603	1504
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	379	2052	144	135	3281	386	67	47	89	219	81	396
RTOR Reduction (vph)	0	5	0	0	9	0	0	0	76	0	45	127
Lane Group Flow (vph)	379	2191	0	135	3658	0	0	114	13	219	198	107
Heavy Vehicles (%)	1%	3%	1%	0%	1%	0%	0%	0%	2%	0%	0%	2%
Turn Type	custom			custom			Perm		Perm	Prot		Perm
Protected Phases	1	6		5	2			4		3	8	
Permitted Phases	1			5			4		4			8
Actuated Green, G (s)	19.0	86.3		13.7	81.0			23.0	23.0	20.0	47.0	47.0
Effective Green, g (s)	19.0	86.3		13.7	81.0			23.0	23.0	20.0	47.0	47.0
Actuated g/C Ratio	0.12	0.54		0.09	0.51			0.14	0.14	0.12	0.29	0.29
Clearance Time (s)	3.0	5.0		3.0	5.0			5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	212	2693		155	2562			186	228	438	471	442
v/s Ratio Prot	c0.21	0.44		0.07	c0.72					c0.06	0.12	
v/s Ratio Perm								c0.09	0.01			0.07
v/c Ratio	1.79	0.81		0.87	1.43			0.61	0.06	0.50	0.42	0.24
Uniform Delay, d1	70.5	30.2		72.3	39.5			64.3	59.1	65.3	45.5	43.0
Progression Factor	0.98	0.97		1.40	0.71			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	368.3	2.1		5.1	192.7			5.9	0.1	4.0	2.7	1.3
Delay (s)	437.2	31.5		106.3	220.8			70.2	59.2	69.4	48.3	44.2
Level of Service	F	C		F	F			E	E	E	D	D
Approach Delay (s)		91.2			216.8			65.4			53.6	
Approach LOS		F			F			E			D	

Intersection Summary			
HCM Average Control Delay	152.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	125.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	822	133	343	1321	209	324	611	198	216	458	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95		0.97	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3467	4903		3467	5037		3400	3410		3400	3404	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3467	4903		3467	5037		3400	3410		3400	3404	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	204	1456	236	607	2339	370	574	1082	351	382	811	255
RTOR Reduction (vph)	0	14	0	0	13	0	0	19	0	0	19	0
Lane Group Flow (vph)	204	1678	0	607	2696	0	574	1414	0	382	1047	0
Heavy Vehicles (%)	1%	4%	1%	1%	1%	0%	3%	1%	5%	3%	2%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	14.6	44.0		18.0	47.4		24.0	56.1		21.9	54.0	
Effective Green, g (s)	14.6	44.0		18.0	47.4		24.0	56.1		21.9	54.0	
Actuated g/C Ratio	0.09	0.28		0.11	0.30		0.15	0.35		0.14	0.34	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	316	1348		390	1492		510	1196		465	1149	
v/s Ratio Prot	0.06	0.34		c0.18	c0.54		c0.17	c0.41		0.11	0.31	
v/s Ratio Perm												
v/c Ratio	0.65	1.24		1.56	1.81		1.13	1.18		0.82	0.91	
Uniform Delay, d1	70.2	58.0		71.0	56.3		68.0	52.0		67.1	50.7	
Progression Factor	0.95	0.68		1.42	0.79		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.8	114.3		251.5	363.5		79.1	90.7		11.1	10.9	
Delay (s)	69.5	153.5		352.6	408.0		147.1	142.6		78.3	61.6	
Level of Service	E	F		F	F		F	F		E	E	
Approach Delay (s)		144.5			397.8			143.9			66.0	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM Average Control Delay	228.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	123.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	199	1008	215	460	1521	99	399	832	559	104	794	259
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.91	
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3099	4802		3273	4975		3467	3406	1568	3467	4792	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3099	4802		3273	4975		3467	3406	1568	3467	4792	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	364	1843	393	841	2780	181	729	1521	1022	190	1451	473
RTOR Reduction (vph)	0	21	0	0	4	0	0	0	254	0	37	0
Lane Group Flow (vph)	364	2215	0	841	2957	0	729	1521	768	190	1887	0
Heavy Vehicles (%)	13%	5%	6%	7%	3%	8%	1%	6%	3%	1%	4%	5%
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	24.0	46.0		31.0	53.0		28.0	52.9	52.9	14.1	39.0	
Effective Green, g (s)	24.0	46.0		31.0	53.0		28.0	52.9	52.9	14.1	39.0	
Actuated g/C Ratio	0.15	0.29		0.19	0.33		0.18	0.33	0.33	0.09	0.24	
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	465	1381		634	1648		607	1126	518	306	1168	
v/s Ratio Prot	0.12	0.46		c0.26	c0.59		c0.21	0.45		0.05	c0.39	
v/s Ratio Perm									c0.49			
v/c Ratio	0.78	1.60		1.33	1.79		1.20	1.35	1.48	0.62	1.62	
Uniform Delay, d1	65.5	57.0		64.5	53.5		66.0	53.5	53.5	70.4	60.5	
Progression Factor	1.21	0.86		0.82	0.90		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.6	272.9		153.0	358.8		105.6	163.8	227.6	3.9	281.0	
Delay (s)	82.2	322.1		205.8	406.8		171.6	217.3	281.2	74.3	341.5	
Level of Service	F	F		F	F		F	F	F	E	F	
Approach Delay (s)		288.5			362.4			227.1			317.5	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	300.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	133.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	2019	49	151	1631	29	97	67	154	58	132	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.90		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	5010		1719	5019		1736	1605		1805	1760	
Flt Permitted	0.04	1.00		0.04	1.00		0.17	1.00		0.11	1.00	
Satd. Flow (perm)	75	5010		72	5019		306	1605		217	1760	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	145	3538	86	265	2858	51	170	117	270	102	231	112
RTOR Reduction (vph)	0	2	0	0	1	0	0	52	0	0	11	0
Lane Group Flow (vph)	145	3622	0	265	2908	0	170	335	0	102	332	0
Heavy Vehicles (%)	5%	3%	10%	5%	3%	7%	4%	6%	6%	0%	3%	2%
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	106.0	97.0		115.0	103.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	106.0	97.0		115.0	103.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.66	0.61		0.72	0.64		0.22	0.22		0.22	0.22	
Clearance Time (s)	3.0	5.0		3.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	142	3037		206	3231		67	351		47	385	
v/s Ratio Prot	0.06	0.72		c0.12	0.58			0.21			0.19	
v/s Ratio Perm	0.62			c0.80			c0.56			0.47		
v/c Ratio	1.02	1.19		1.29	0.90		2.54	0.96		2.17	0.86	
Uniform Delay, d1	52.8	31.5		60.5	24.1		62.5	61.7		62.5	60.2	
Progression Factor	1.55	0.84		0.55	1.77		1.00	1.00		1.00	1.00	
Incremental Delay, d2	28.1	87.1		132.3	0.4		733.6	36.2		590.0	17.7	
Delay (s)	110.0	113.4		165.9	43.1		796.1	97.9		652.5	77.9	
Level of Service	F	F		F	D		F	F		F	E	
Approach Delay (s)		113.3			53.4			311.0			209.6	
Approach LOS		F			D			F			F	

Intersection Summary			
HCM Average Control Delay	108.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.55		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	126.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	2053	30	354	1705	351	99	119	592	592	229	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.91		0.97	0.91		1.00	0.95	0.95	0.91	0.91	
Frt	1.00	1.00		1.00	0.97		1.00	0.90	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	0.98	
Satd. Flow (prot)	1752	5074		3213	4798		1787	1556	1490	1595	3182	
Flt Permitted	0.95	1.00		0.95	1.00		0.26	1.00	1.00	0.13	0.62	
Satd. Flow (perm)	1752	5074		3213	4798		497	1556	1490	217	2037	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	123	3674	54	633	3051	628	177	213	1059	1059	410	97
RTOR Reduction (vph)	0	1	0	0	19	0	0	46	122	0	5	0
Lane Group Flow (vph)	123	3727	0	633	3660	0	177	601	503	529	1032	0
Heavy Vehicles (%)	3%	2%	3%	9%	5%	7%	1%	7%	3%	3%	7%	2%
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	1	6		5	2			4			3	
Permitted Phases							4		4	3		
Actuated Green, G (s)	8.0	72.0		18.0	84.0		19.0	19.0	19.0	31.0	31.0	
Effective Green, g (s)	8.0	72.0		18.0	84.0		19.0	19.0	19.0	31.0	31.0	
Actuated g/C Ratio	0.05	0.45		0.11	0.52		0.12	0.12	0.12	0.19	0.19	
Clearance Time (s)	3.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	88	2283		361	2519		59	185	177	42	395	
v/s Ratio Prot	0.07	c0.73		c0.20	0.76			c0.39				
v/s Ratio Perm							0.36		0.34	c2.44	0.51	
v/c Ratio	1.40	1.63		1.75	1.45		3.00	3.25	2.84	12.60	10.82dl	
Uniform Delay, d1	76.0	44.0		71.0	38.0		70.5	70.5	70.5	64.5	64.5	
Progression Factor	1.15	0.74		0.79	1.16		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	185.2	284.8		345.1	204.9		943.6	1026.2	843.0	5264.0	733.2	
Delay (s)	272.4	317.5		400.9	249.2		1014.1	1096.7	913.5	5328.5	797.7	
Level of Service	F	F		F	F		F	F	F	F	F	
Approach Delay (s)		316.0			271.5			1007.6			2328.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	670.4	HCM Level of Service	F
HCM Volume to Capacity ratio	4.29		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	162.3%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1450	1985	0	362	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		6.0	
Lane Util. Factor		0.91	0.91		0.94	
Frt		1.00	1.00		0.99	
Flt Protected		1.00	1.00		0.95	
Satd. Flow (prot)		5085	4940		4513	
Flt Permitted		1.00	1.00		0.95	
Satd. Flow (perm)		5085	4940		4513	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor (vph)	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	0	2801	3835	0	699	27
RTOR Reduction (vph)	0	0	0	0	1	0
Lane Group Flow (vph)	0	2801	3835	0	725	0
Heavy Vehicles (%)	0%	2%	5%	0%	12%	29%
Turn Type						
Protected Phases		6	2		4	
Permitted Phases						
Actuated Green, G (s)		120.1	120.1		28.9	
Effective Green, g (s)		120.1	120.1		28.9	
Actuated g/C Ratio		0.75	0.75		0.18	
Clearance Time (s)		5.0	5.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		3817	3708		815	
v/s Ratio Prot		0.55	c0.78		c0.16	
v/s Ratio Perm						
v/c Ratio		0.73	1.03		0.89	
Uniform Delay, d1		11.1	20.0		64.0	
Progression Factor		0.48	1.25		1.00	
Incremental Delay, d2		0.1	23.2		11.7	
Delay (s)		5.4	48.1		75.7	
Level of Service		A	D		E	
Approach Delay (s)		5.4	48.1		75.7	
Approach LOS		A	D		E	

Intersection Summary			
HCM Average Control Delay	34.6	HCM Level of Service	C
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1876	0	0	1405	428	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	6.0	
Lane Util. Factor	0.91			0.91	0.94	
Frt	1.00			1.00	0.98	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	4988			5036	4777	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	4988			5036	4777	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor (vph)	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	3254	0	0	2437	742	99
RTOR Reduction (vph)	0	0	0	0	3	0
Lane Group Flow (vph)	3254	0	0	2437	838	0
Heavy Vehicles (%)	4%	0%	0%	3%	6%	2%
Turn Type						
Protected Phases	6			2	4	
Permitted Phases						
Actuated Green, G (s)	123.0			123.0	26.0	
Effective Green, g (s)	123.0			123.0	26.0	
Actuated g/C Ratio	0.77			0.77	0.16	
Clearance Time (s)	5.0			5.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	3835			3871	776	
v/s Ratio Prot	c0.65			0.48	c0.18	
v/s Ratio Perm						
v/c Ratio	0.85			0.63	1.08	
Uniform Delay, d1	12.3			8.3	67.0	
Progression Factor	0.61			1.00	1.00	
Incremental Delay, d2	1.6			0.8	56.3	
Delay (s)	9.1			9.1	123.3	
Level of Service	A			A	F	
Approach Delay (s)	9.1			9.1	123.3	
Approach LOS	A			A	F	

Intersection Summary			
HCM Average Control Delay	23.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: EB NW 36 Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
NW 87 Avenue	II	40	90.4	301.7	392.1	1.00	9.2	F
NW 82 Avenue	II	40	47.2	113.7	160.9	0.51	11.4	F
NW 79 Avenue	II	39	28.1	311.2	339.3	0.26	2.7	F
SR 826 SB Off-Ramp	II	37	19.8	5.6	25.4	0.16	22.4	C
SR 826 NB Off-Ramp	II	40	21.5	9.3	30.8	0.19	21.8	D
Total	II		207.0	741.5	948.5	2.11	8.0	F

Arterial Level of Service: WB NW 36 Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
SR 826 NB Off-Ramp	II	38	24.0	9.2	33.2	0.21	22.6	C
SR 826 SB Off-Ramp	II	40	21.5	47.8	69.3	0.19	9.7	F
NW 79 Avenue	II	36	19.8	237.3	257.1	0.16	2.2	F
NW 82 Avenue	II	40	28.1	43.9	72.0	0.26	12.8	F
NW 87 Avenue	II	40	47.2	387.1	434.3	0.51	4.2	F
Total	II		140.6	725.3	865.9	1.32	5.5	F

Arterial Level of Service: EB NW 41 Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	40	13.1	6.4	19.5	0.11	21.0	D
Turnpike NB Off-Ramp	II	40	18.7	2.4	21.1	0.16	27.8	C
NW 115 Avenue	II	40	14.2	39.6	53.8	0.12	8.3	F
NW 114 Avenue	II	40	17.1	23.5	40.6	0.15	13.2	E
NW 112 Avenue	II	40	27.5	14.1	41.6	0.25	21.7	D
NW 107 Avenue	II	40	46.6	94.6	141.2	0.50	12.8	F
NW 102 Avenue	II	40	45.7	31.7	77.4	0.49	22.9	C
NW 97 Avenue	II	40	48.1	147.6	195.7	0.52	9.5	F
Total	II		231.0	359.9	590.9	2.31	14.1	E

Arterial Level of Service: WB NW 41 Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
NW 97 Avenue	II	40	90.4	387.9	478.3	1.00	7.6	F
NW 102 Avenue	II	40	48.1	218.6	266.7	0.52	7.0	F
NW 107 Avenue	II	40	45.7	423.3	469.0	0.49	3.8	F
NW 112 Avenue	II	40	46.6	241.5	288.1	0.50	6.3	F
NW 114 Avenue	II	40	27.5	121.8	149.3	0.25	6.0	F
NW 115 Avenue	II	40	17.1	217.4	234.5	0.15	2.3	F
Turnpike NB On-Ramp	II	40	14.2	13.6	27.8	0.12	16.0	E
Turnpike SB Off-Ramp	II	40	18.7	9.2	27.9	0.16	21.0	D
Total	II		308.3	1633.3	1941.6	3.20	5.9	F

Alternative 5A

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	201	34	940	13
v/c Ratio	0.14	0.04	0.66	0.01
Control Delay	6.3	9.0	20.5	0.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.3	9.0	20.5	0.0
Queue Length 50th (ft)	12	6	107	0
Queue Length 95th (ft)	32	20	127	0
Internal Link Dist (ft)	520	258		
Turn Bay Length (ft)				255
Base Capacity (vph)	1469	856	2236	944
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.14	0.04	0.42	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	73	35	3	15	0	0	0	0	503	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0					5.0		4.0
Lane Util. Factor		0.95			1.00					0.94		1.00
Frt		0.95			1.00					1.00		0.85
Flt Protected		1.00			0.99					0.95		1.00
Satd. Flow (prot)		2734			1676					4545		944
Flt Permitted		1.00			0.96					0.95		1.00
Satd. Flow (perm)		2734			1627					4545		944
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	0	136	65	6	28	0	0	0	0	940	0	13
RTOR Reduction (vph)	0	31	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	170	0	0	34	0	0	0	0	940	0	13
Heavy Vehicles (%)	2%	3%	73%	0%	15%	3%	0%	0%	0%	12%	0%	71%
Turn Type				Perm						custom		Free
Protected Phases		6			2							
Permitted Phases				2						4		Free
Actuated Green, G (s)		33.1			33.1					19.9		63.0
Effective Green, g (s)		33.1			33.1					19.9		63.0
Actuated g/C Ratio		0.53			0.53					0.32		1.00
Clearance Time (s)		5.0			5.0					5.0		
Vehicle Extension (s)		3.0			3.0					3.0		
Lane Grp Cap (vph)		1436			855					1436		944
v/s Ratio Prot		c0.06										
v/s Ratio Perm					0.02					c0.21		0.01
v/c Ratio		0.12			0.04					0.65		0.01
Uniform Delay, d1		7.6			7.2					18.6		0.0
Progression Factor		1.00			1.00					1.00		1.00
Incremental Delay, d2		0.2			0.1					1.1		0.0
Delay (s)		7.7			7.3					19.7		0.0
Level of Service		A			A					B		A
Approach Delay (s)		7.7			7.3			0.0			19.4	
Approach LOS		A			A			A			B	

Intersection Summary			
HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	63.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	81	868	1973	1997	279	898
v/c Ratio	0.36	0.44	0.74	1.27	0.56	0.72
Control Delay	20.2	9.1	16.9	147.2	30.7	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	9.1	16.9	147.2	30.7	18.7
Queue Length 50th (ft)	14	108	289	~2419	121	100
Queue Length 95th (ft)	28	146	m291	m#1078	197	156
Internal Link Dist (ft)		442	573		1069	
Turn Bay Length (ft)	300			400		
Base Capacity (vph)	228	1974	2684	1568	497	1242
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.44	0.74	1.27	0.56	0.72

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	490	0	0	1114	1917	14	244	507	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0			5.0	4.0		5.0	5.0			
Lane Util. Factor	1.00	0.95			0.91	1.00		1.00	0.76			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (prot)	1805	3223			5136	1568		1892	3646			
Flt Permitted	0.09	1.00			1.00	1.00		1.00	1.00			
Satd. Flow (perm)	165	3223			5136	1568		1892	3646			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	170%	170%	170%	170%	170%	100%	170%	100%	170%	170%	170%	170%
Adj. Flow (vph)	81	868	0	0	1973	1997	25	254	898	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	285	0	0	0
Lane Group Flow (vph)	81	868	0	0	1973	1997	0	279	613	0	0	0
Heavy Vehicles (%)	0%	12%	0%	0%	1%	3%	0%	0%	1%	0%	0%	0%
Turn Type	pm+pt					Free	Split		Prot			
Protected Phases	1	6			2		4	4	4			
Permitted Phases	6					Free						
Actuated Green, G (s)	51.0	49.0			41.2	80.0		21.0	21.0			
Effective Green, g (s)	51.0	49.0			41.2	80.0		21.0	21.0			
Actuated g/C Ratio	0.64	0.61			0.52	1.00		0.26	0.26			
Clearance Time (s)	3.0	5.0			5.0			5.0	5.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	204	1974			2645	1568		497	957			
v/s Ratio Prot	0.02	0.27			0.38			0.15	0.17			
v/s Ratio Perm	0.23					c1.27						
v/c Ratio	0.40	0.44			0.75	1.27		0.56	0.64			
Uniform Delay, d1	21.4	8.2			15.3	40.0		25.5	26.2			
Progression Factor	1.00	1.00			1.05	1.00		1.00	1.00			
Incremental Delay, d2	1.3	0.7			0.8	125.3		4.5	3.3			
Delay (s)	22.7	8.9			16.9	165.3		30.0	29.4			
Level of Service	C	A			B	F		C	C			
Approach Delay (s)		10.1			91.6			29.6			0.0	
Approach LOS		B			F			C			A	

Intersection Summary			
HCM Average Control Delay	66.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	294	1517	360	495	3350	144	282	444	37	57
v/c Ratio	0.98	0.77	0.43	0.41	1.00	0.13	0.63	1.00	0.84	0.61
Control Delay	117.5	41.4	5.1	31.6	14.0	0.6	72.6	68.0	167.8	45.3
Queue Delay	0.0	0.1	0.1	0.0	41.9	0.0	0.0	2.3	0.0	0.0
Total Delay	117.5	41.5	5.1	31.6	56.0	0.6	72.6	70.3	167.8	45.3
Queue Length 50th (ft)	164	494	20	200	~386	2	146	205	39	2
Queue Length 95th (ft)	#266	479	70	m168	m202	m0	198	#444	#117	#65
Internal Link Dist (ft)		573			706			461		83
Turn Bay Length (ft)	150			200						
Base Capacity (vph)	300	2797	1031	1220	3337	1068	451	445	44	93
Starvation Cap Reductn	0	301	104	0	320	0	0	0	0	0
Spillback Cap Reductn	0	85	0	0	0	0	0	4	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.61	0.39	0.41	1.11	0.13	0.63	1.01	0.84	0.61

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	159	821	195	268	3082	78	259	3	237	20	1	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	1587		1770	1593	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3433	1587		1770	1593	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	170%	170%	170%	170%	100%	170%	100%	170%	170%	170%	170%	170%
Adj. Flow (vph)	294	1517	360	495	3350	144	282	6	438	37	2	55
RTOR Reduction (vph)	0	0	218	0	0	29	0	236	0	0	54	0
Lane Group Flow (vph)	294	1517	142	495	3350	115	282	208	0	37	3	0
Turn Type	Prot		Perm	Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6			2						
Actuated Green, G (s)	14.0	62.1	62.1	56.9	105.0	105.0	21.0	21.0		4.0	4.0	
Effective Green, g (s)	14.0	62.1	62.1	56.9	105.0	105.0	21.0	21.0		4.0	4.0	
Actuated g/C Ratio	0.09	0.39	0.39	0.36	0.66	0.66	0.13	0.13		0.02	0.02	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	300	1974	614	1221	3337	1039	451	208		44	40	
v/s Ratio Prot	c0.09	0.30		0.14	c0.66		0.08	c0.13		c0.02	0.00	
v/s Ratio Perm			0.09			0.07						
v/c Ratio	0.98	0.77	0.23	0.41	1.00	0.11	0.63	1.00		0.84	0.08	
Uniform Delay, d1	72.9	42.7	32.9	38.8	27.5	10.2	65.8	69.5		77.7	76.2	
Progression Factor	1.03	0.92	1.35	0.78	0.26	0.13	1.00	1.00		1.00	1.00	
Incremental Delay, d2	43.2	1.7	0.2	0.0	5.6	0.0	2.7	61.5		77.3	0.9	
Delay (s)	118.1	40.9	44.6	30.3	12.7	1.3	68.5	131.0		155.0	77.1	
Level of Service	F	D	D	C	B	A	E	F		F	E	
Approach Delay (s)		51.9			14.5			106.7			107.8	
Approach LOS		D			B			F			F	

Intersection Summary			
HCM Average Control Delay	37.0	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	105.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	368	1797	439	3180	369	557	303	473	641
v/c Ratio	1.43	0.88	0.94	1.33	1.42	1.23	1.31	1.12	1.37
Control Delay	258.3	23.5	72.8	176.5	245.2	169.0	204.2	134.7	215.9
Queue Delay	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	258.3	24.6	72.8	176.5	245.2	169.0	204.2	134.7	215.9
Queue Length 50th (ft)	~272	642	248	~1566	~468	~709	~353	~567	~769
Queue Length 95th (ft)	m#362	m676	m202	m#1027	#683	#951	#555	#796	#1020
Internal Link Dist (ft)		706		731		499		697	
Turn Bay Length (ft)	215		295				550		
Base Capacity (vph)	257	2035	468	2387	260	453	231	423	467
Starvation Cap Reductn	0	89	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.43	0.92	0.94	1.33	1.42	1.23	1.31	1.12	1.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	208	951	64	248	2678	220	354	225	90	171	267	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	5.0
Lane Util. Factor	0.97	0.91		0.97	0.91		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4919		3400	4998		1703	1776		1805	1881	1599
Flt Permitted	0.95	1.00		0.95	1.00		0.10	1.00		0.11	1.00	1.00
Satd. Flow (perm)	3433	4919		3400	4998		184	1776		211	1881	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	170%	170%	170%	170%	100%	170%	100%	170%	170%	170%	170%	170%
Adj. Flow (vph)	368	1684	113	439	2790	390	369	398	159	303	473	641
RTOR Reduction (vph)	0	5	0	0	12	0	0	9	0	0	0	107
Lane Group Flow (vph)	368	1792	0	439	3168	0	369	548	0	303	473	534
Heavy Vehicles (%)	2%	3%	26%	3%	2%	1%	6%	1%	6%	0%	1%	1%
Turn Type	Prot			Prot			pm+pt			pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases							8			4		4
Actuated Green, G (s)	12.0	66.0		22.0	76.0		59.0	40.0		52.0	36.0	36.0
Effective Green, g (s)	12.0	66.0		22.0	76.0		59.0	40.0		52.0	36.0	36.0
Actuated g/C Ratio	0.08	0.41		0.14	0.48		0.37	0.25		0.32	0.22	0.22
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	257	2029		468	2374		258	444		228	423	360
v/s Ratio Prot	c0.11	0.36		0.13	c0.63		c0.18	0.31		0.13	0.25	
v/s Ratio Perm							c0.35			0.30		0.33
v/c Ratio	1.43	0.88		0.94	1.33		1.43	1.23		1.33	1.12	1.48
Uniform Delay, d1	74.0	43.4		68.3	42.0		50.4	60.0		47.4	62.0	62.0
Progression Factor	0.95	0.42		1.01	0.66		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	211.5	4.9		4.1	150.9		214.5	123.6		175.0	80.0	232.0
Delay (s)	281.6	23.4		73.2	178.6		264.9	183.6		222.4	142.0	294.0
Level of Service	F	C		E	F		F	F		F	F	F
Approach Delay (s)		67.3			165.8			216.0			227.9	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	156.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	130.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	439	468	3672	463	217
v/c Ratio	1.25	0.37	1.32	0.72	0.63
Control Delay	161.9	6.0	168.3	29.7	22.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	161.9	6.0	168.3	29.7	22.2
Queue Length 50th (ft)	~189	115	~1793	80	42
Queue Length 95th (ft)	m#226	m158	m#946	131	120
Internal Link Dist (ft)		430	420	615	
Turn Bay Length (ft)	210			410	
Base Capacity (vph)	350	1281	2780	644	346
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.25	0.37	1.32	0.72	0.63

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	243	259	3174	163	136	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0		7.0	7.0
Lane Util. Factor	0.97	1.00	0.91		0.97	0.91
Frt	1.00	1.00	0.99		0.93	0.85
Flt Protected	0.95	1.00	1.00		0.97	1.00
Satd. Flow (prot)	3502	1863	5032		3288	1455
Flt Permitted	0.95	1.00	1.00		0.97	1.00
Satd. Flow (perm)	3502	1863	5032		3288	1455
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	170%	170%	100%	170%	170%	170%
Adj. Flow (vph)	439	468	3377	295	246	434
RTOR Reduction (vph)	0	0	13	0	110	110
Lane Group Flow (vph)	439	468	3659	0	353	107
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%
Turn Type	Prot					Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	8.0	55.0	44.0		13.0	13.0
Effective Green, g (s)	8.0	55.0	44.0		13.0	13.0
Actuated g/C Ratio	0.10	0.69	0.55		0.16	0.16
Clearance Time (s)	3.0	5.0	5.0		7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	350	1281	2768		534	236
v/s Ratio Prot	c0.13	0.25	c0.73		c0.11	
v/s Ratio Perm						0.07
v/c Ratio	1.25	0.37	1.32		0.66	0.45
Uniform Delay, d1	36.0	5.2	18.0		31.4	30.3
Progression Factor	1.19	1.06	1.24		1.00	1.00
Incremental Delay, d2	124.8	0.4	145.2		6.3	6.2
Delay (s)	167.7	5.9	167.5		37.8	36.5
Level of Service	F	A	F		D	D
Approach Delay (s)		84.2	167.5		37.4	
Approach LOS		F	F		D	

Intersection Summary			
HCM Average Control Delay	136.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	103.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	291	1523	744	2786	615	1003	380	264	1200
v/c Ratio	1.22	1.00	1.22	1.33	1.33	0.95	1.02	0.90	1.41
Control Delay	174.0	54.6	148.4	181.4	212.3	73.0	85.1	104.1	233.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	174.0	54.6	148.4	181.4	212.3	73.0	85.1	104.1	233.9
Queue Length 50th (ft)	~189	~590	~487	~1368	~428	540	~241	144	~882
Queue Length 95th (ft)	m#234	m#645	m#419	m#1154	#554	#671	#458	#239	#1024
Internal Link Dist (ft)		1784		1236		538			533
Turn Bay Length (ft)	305		375		260		225	205	
Base Capacity (vph)	238	1516	610	2100	463	1072	372	292	851
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.22	1.00	1.22	1.33	1.33	0.94	1.02	0.90	1.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	168	677	201	429	2406	191	603	578	219	152	573	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3467	4841		3367	4989		3367	3574	1524	3400	3448	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3467	4841		3367	4989		3367	3574	1524	3400	3448	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor (vph)	170%	170%	170%	170%	100%	170%	100%	170%	170%	170%	170%	170%
Adj. Flow (vph)	291	1174	349	744	2455	331	615	1003	380	264	994	206
RTOR Reduction (vph)	0	33	0	0	11	0	0	0	162	0	11	0
Lane Group Flow (vph)	291	1490	0	744	2775	0	615	1003	218	264	1189	0
Heavy Vehicles (%)	1%	3%	5%	4%	2%	3%	4%	1%	6%	3%	2%	2%
Turn Type	Prot			Prot			Prot		custom	Prot		
Protected Phases	1	6		5	2		4	8		7	3	
Permitted Phases									4			
Actuated Green, G (s)	11.0	49.0		29.0	67.0		22.0	47.2	22.0	13.8	39.0	
Effective Green, g (s)	11.0	49.0		29.0	67.0		22.0	47.2	22.0	13.8	39.0	
Actuated g/C Ratio	0.07	0.31		0.18	0.42		0.14	0.30	0.14	0.09	0.24	
Clearance Time (s)	3.0	6.0		3.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	238	1483		610	2089		463	1054	210	293	840	
v/s Ratio Prot	c0.08	0.31		0.22	c0.56		c0.18	0.28		0.08	c0.34	
v/s Ratio Perm									0.14			
v/c Ratio	1.22	1.00		1.22	1.33		1.33	0.95	1.04	0.90	1.42	
Uniform Delay, d1	74.5	55.5		65.5	46.5		69.0	55.3	69.0	72.4	60.5	
Progression Factor	0.90	0.66		0.89	0.88		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	120.8	19.1		100.3	148.1		162.1	17.2	72.2	28.6	194.2	
Delay (s)	187.5	55.6		158.8	188.8		231.1	72.5	141.2	101.0	254.7	
Level of Service	F	E		F	F		F	E	F	F	F	
Approach Delay (s)		76.8			182.4			134.4			227.0	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	157.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	130.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	379	2196	135	3595	114	89	219	243	234
v/c Ratio	1.25	0.67	0.60	1.12	1.28	0.46	0.59	0.67	0.59
Control Delay	170.4	5.7	85.2	70.2	243.0	20.7	75.2	54.9	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	170.4	5.7	85.2	70.2	243.0	20.7	75.2	54.9	34.3
Queue Length 50th (ft)	~251	138	70	~1606	~151	0	114	193	113
Queue Length 95th (ft)	m#288	m139	m72	m#1426	#287	60	161	303	216
Internal Link Dist (ft)		1200		2650	285			517	
Turn Bay Length (ft)	300		340				130		
Base Capacity (vph)	303	3272	241	3203	89	192	372	365	397
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.25	0.67	0.56	1.12	1.28	0.46	0.59	0.67	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	216	1171	82	77	3113	220	38	27	51	125	46	226
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0			5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	0.97	0.91		0.97	0.91			1.00	1.00	0.97	0.95	0.95
Frt	1.00	0.99		1.00	0.98			1.00	0.85	1.00	0.90	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	4993		3502	5058			1846	1583	3502	1603	1504
Flt Permitted	0.95	1.00		0.95	1.00			0.68	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	4993		3502	5058			1293	1583	3502	1603	1504
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor (vph)	170%	170%	170%	170%	100%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	379	2052	144	135	3209	386	67	47	89	219	81	396
RTOR Reduction (vph)	0	5	0	0	9	0	0	0	83	0	45	96
Lane Group Flow (vph)	379	2191	0	135	3586	0	0	114	6	219	198	138
Heavy Vehicles (%)	1%	3%	1%	0%	1%	0%	0%	0%	2%	0%	0%	2%
Turn Type	Prot			Prot			Perm		Perm	Prot		Perm
Protected Phases	1	6		5	2			4		3	8	
Permitted Phases							4		4			8
Actuated Green, G (s)	14.0	104.7		10.3	101.0			11.0	11.0	17.0	32.0	32.0
Effective Green, g (s)	14.0	104.7		10.3	101.0			11.0	11.0	17.0	32.0	32.0
Actuated g/C Ratio	0.09	0.65		0.06	0.63			0.07	0.07	0.11	0.20	0.20
Clearance Time (s)	3.0	5.0		3.0	5.0			5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	303	3267		225	3193			89	109	372	321	301
v/s Ratio Prot	c0.11	0.44		0.04	c0.71					0.06	c0.12	
v/s Ratio Perm								c0.09	0.00			0.09
v/c Ratio	1.25	0.67		0.60	1.12			1.28	0.06	0.59	0.62	0.46
Uniform Delay, d1	73.0	17.0		72.8	29.5			74.5	69.6	68.2	58.4	56.4
Progression Factor	0.64	0.29		1.10	0.31			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	130.8	0.8		1.8	57.4			188.3	0.2	6.7	8.6	5.0
Delay (s)	177.5	5.7		82.2	66.6			262.8	69.9	74.9	67.0	61.3
Level of Service	F	A		F	E			F	E	E	E	E
Approach Delay (s)		31.0			67.1			178.2			67.6	
Approach LOS		C			E			F			E	

Intersection Summary			
HCM Average Control Delay	57.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	114.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	204	1692	607	2339	370	502	1082	351	382	1066
v/c Ratio	1.18	1.07	1.12	1.07	0.49	1.13	1.03	0.64	1.06	1.14
Control Delay	174.2	77.9	95.9	53.1	4.4	141.8	90.2	35.0	129.4	126.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	174.2	77.9	95.9	53.1	4.4	141.8	90.2	35.0	129.4	126.5
Queue Length 50th (ft)	~129	~721	~380	~981	67	~311	~635	197	~224	~674
Queue Length 95th (ft)	#220	#808	m209	m312	m28	#430	#775	316	#336	#816
Internal Link Dist (ft)		2650		710			455			362
Turn Bay Length (ft)	445		150		150	150		150	185	
Base Capacity (vph)	173	1576	542	2183	754	446	1050	549	361	934
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	1.07	1.12	1.07	0.49	1.13	1.03	0.64	1.06	1.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	822	133	343	1321	209	482	611	198	216	458	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3467	4903		3467	5136	1615	3400	3574	1538	3400	3404	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3467	4903		3467	5136	1615	3400	3574	1538	3400	3404	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	100%	170%	170%	170%	170%	170%
Adj. Flow (vph)	204	1456	236	607	2339	370	502	1082	351	382	811	255
RTOR Reduction (vph)	0	14	0	0	0	68	0	0	97	0	19	0
Lane Group Flow (vph)	204	1678	0	607	2339	302	502	1082	254	382	1047	0
Heavy Vehicles (%)	1%	4%	1%	1%	1%	0%	3%	1%	5%	3%	2%	3%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			
Actuated Green, G (s)	8.0	51.0		25.0	68.0	68.0	21.0	47.0	47.0	17.0	43.0	
Effective Green, g (s)	8.0	51.0		25.0	68.0	68.0	21.0	47.0	47.0	17.0	43.0	
Actuated g/C Ratio	0.05	0.32		0.16	0.42	0.42	0.13	0.29	0.29	0.11	0.27	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	173	1563		542	2183	686	446	1050	452	361	915	
v/s Ratio Prot	0.06	c0.34		c0.18	c0.46		c0.15	0.30		0.11	c0.31	
v/s Ratio Perm						0.19			0.16			
v/c Ratio	1.18	1.07		1.12	1.07	0.44	1.13	1.03	0.56	1.06	1.14	
Uniform Delay, d1	76.0	54.5		67.5	46.0	32.5	69.5	56.5	47.8	71.5	58.5	
Progression Factor	0.93	0.67		0.62	0.39	0.19	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	116.2	42.9		56.6	33.2	0.2	81.6	35.9	1.6	63.5	77.9	
Delay (s)	187.0	79.3		98.3	51.3	6.4	151.1	92.4	49.4	135.0	136.4	
Level of Service	F	E		F	D	A	F	F	D	F	F	
Approach Delay (s)		90.9			54.9			99.8			136.1	
Approach LOS		F			D			F			F	

Intersection Summary			
HCM Average Control Delay	86.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	108.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	364	2236	841	2961	729	1521	1022	190	1924
v/c Ratio	1.34	1.39	1.52	1.44	1.46	1.25	1.29	1.25	1.52
Control Delay	213.4	210.0	280.5	226.0	264.5	163.6	168.8	213.2	277.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	213.4	210.0	280.5	226.0	264.5	163.6	168.8	213.2	277.2
Queue Length 50th (ft)	~260	~1151	~628	~1553	~536	~1043	~1107	~127	~1017
Queue Length 95th (ft)	m#274	m#1093	m#657	m#1562	#667	#1182	#1375	#214	#1109
Internal Link Dist (ft)		479		2601		679			784
Turn Bay Length (ft)	135		200		455			185	
Base Capacity (vph)	271	1612	552	2057	498	1213	790	152	1264
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.34	1.39	1.52	1.44	1.46	1.25	1.29	1.25	1.52

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	199	1008	215	460	1521	99	399	832	559	104	794	259
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.91	
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3099	4802		3273	4975		3467	3406	1568	3467	4792	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3099	4802		3273	4975		3467	3406	1568	3467	4792	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	364	1843	393	841	2780	181	729	1521	1022	190	1451	473
RTOR Reduction (vph)	0	21	0	0	5	0	0	0	232	0	36	0
Lane Group Flow (vph)	364	2215	0	841	2956	0	729	1521	790	190	1888	0
Heavy Vehicles (%)	13%	5%	6%	7%	3%	8%	1%	6%	3%	1%	4%	5%
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	14.0	53.0		27.0	66.0		23.0	57.0	57.0	7.0	41.0	
Effective Green, g (s)	14.0	53.0		27.0	66.0		23.0	57.0	57.0	7.0	41.0	
Actuated g/C Ratio	0.09	0.33		0.17	0.41		0.14	0.36	0.36	0.04	0.26	
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	271	1591		552	2052		498	1213	559	152	1228	
v/s Ratio Prot	0.12	c0.46		c0.26	c0.59		c0.21	0.45		0.05	c0.39	
v/s Ratio Perm									0.50			
v/c Ratio	1.34	1.39		1.52	1.44		1.46	1.25	1.41	1.25	1.54	
Uniform Delay, d1	73.0	53.5		66.5	47.0		68.5	51.5	51.5	76.5	59.5	
Progression Factor	0.87	0.80		0.92	0.62		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	166.7	178.6		240.6	199.9		219.6	121.2	196.6	155.4	245.8	
Delay (s)	230.5	221.2		301.9	228.9		288.1	172.7	248.1	231.9	305.3	
Level of Service	F	F		F	F		F	F	F	F	F	
Approach Delay (s)		222.5			245.0			221.9			298.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	243.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	133.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	145	3624	265	2909	170	387	102	343
v/c Ratio	0.94	1.29	1.35	0.99	1.31	0.80	1.01	0.71
Control Delay	66.2	154.2	198.0	18.5	227.6	57.8	148.9	59.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.2	154.2	198.0	18.5	227.6	57.8	148.9	59.7
Queue Length 50th (ft)	99	~1774	~330	374	~228	317	~109	313
Queue Length 95th (ft)	m81	m#1175	m94	m41	#391	#463	#244	435
Internal Link Dist (ft)		2601		59		285		315
Turn Bay Length (ft)	165				100		100	
Base Capacity (vph)	154	2819	196	2949	130	483	101	484
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	1.29	1.35	0.99	1.31	0.80	1.01	0.71

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	2019	49	151	1631	29	97	67	154	58	132	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.90		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	5010		1719	5019		1736	1605		1805	1760	
Flt Permitted	0.05	1.00		0.05	1.00		0.26	1.00		0.20	1.00	
Satd. Flow (perm)	90	5010		88	5019		482	1605		376	1760	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	145	3538	86	265	2858	51	170	117	270	102	231	112
RTOR Reduction (vph)	0	2	0	0	1	0	0	52	0	0	11	0
Lane Group Flow (vph)	145	3622	0	265	2908	0	170	335	0	102	332	0
Heavy Vehicles (%)	5%	3%	10%	5%	3%	7%	4%	6%	6%	0%	3%	2%
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	90.0	90.0		96.0	94.0		43.0	43.0		43.0	43.0	
Effective Green, g (s)	90.0	90.0		96.0	94.0		43.0	43.0		43.0	43.0	
Actuated g/C Ratio	0.56	0.56		0.60	0.59		0.27	0.27		0.27	0.27	
Clearance Time (s)	3.0	5.0		3.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	152	2818		196	2949		130	431		101	473	
v/s Ratio Prot	0.06	c0.72		c0.12	0.58			0.21			0.19	
v/s Ratio Perm	0.47			c0.69			c0.35			0.27		
v/c Ratio	0.95	1.29		1.35	0.99		1.31	0.78		1.01	0.70	
Uniform Delay, d1	50.7	35.0		69.1	32.4		58.5	54.1		58.5	52.7	
Progression Factor	1.53	0.71		0.74	0.46		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.6	128.7		161.5	2.7		183.0	8.6		92.3	4.7	
Delay (s)	90.2	153.7		212.5	17.7		241.5	62.7		150.8	57.4	
Level of Service	F	F		F	B		F	E		F	E	
Approach Delay (s)		151.2			34.0			117.2			78.8	
Approach LOS		F			C			F			E	

Intersection Summary			
HCM Average Control Delay	97.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	126.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	123	3728	633	3679	177	647	625	529	1037
v/c Ratio	1.60	2.45	2.43	2.17	2.60	2.49	1.95	12.60	11.04dl
Control Delay	319.7	678.9	673.3	549.7	786.4	704.5	465.7	5268.7	257.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	319.7	678.9	673.3	549.7	786.4	704.5	465.7	5268.7	257.1
Queue Length 50th (ft)	~188	~2353	~564	~2249	~310	~1137	~935	~1176	~818
Queue Length 95th (ft)	m#138	m#1758	m#593	m#2274	#474	#1401	#1196	#1437	#964
Internal Link Dist (ft)		235		440		433			391
Turn Bay Length (ft)			450		205			225	
Base Capacity (vph)	77	1523	261	1698	68	260	320	42	704
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.60	2.45	2.43	2.17	2.60	2.49	1.95	12.60	1.47

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	2053	30	354	1705	351	99	119	592	592	229	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.91		0.97	0.91		1.00	0.95	0.95	0.91	0.91	
Frt	1.00	1.00		1.00	0.97		1.00	0.90	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	0.98	
Satd. Flow (prot)	1752	5074		3213	4798		1787	1556	1490	1595	3182	
Flt Permitted	0.95	1.00		0.95	1.00		0.26	1.00	1.00	0.07	0.60	
Satd. Flow (perm)	1752	5074		3213	4798		497	1556	1490	118	1965	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	123	3674	54	633	3051	628	177	213	1059	1059	410	97
RTOR Reduction (vph)	0	1	0	0	20	0	0	46	115	0	5	0
Lane Group Flow (vph)	123	3727	0	633	3660	0	177	601	510	529	1032	0
Heavy Vehicles (%)	3%	2%	3%	9%	5%	7%	1%	7%	3%	3%	7%	2%
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	1	6		5	2			4			3	
Permitted Phases							4		4	3		
Actuated Green, G (s)	7.0	48.0		13.0	56.0		22.0	22.0	22.0	57.0	57.0	
Effective Green, g (s)	7.0	48.0		13.0	56.0		22.0	22.0	22.0	57.0	57.0	
Actuated g/C Ratio	0.04	0.30		0.08	0.35		0.14	0.14	0.14	0.36	0.36	
Clearance Time (s)	3.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	77	1522		261	1679		68	214	205	42	700	
v/s Ratio Prot	0.07	c0.73		0.20	c0.76			c0.39				
v/s Ratio Perm							0.36		0.34	c4.49	0.53	
v/c Ratio	1.60	2.45		2.43	2.18		2.60	2.81	2.49	12.60	11.04dl	
Uniform Delay, d1	76.5	56.0		73.5	52.0		69.0	69.0	69.0	51.5	51.5	
Progression Factor	1.06	1.36		0.86	0.80		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	274.3	652.2		648.0	531.9		762.0	827.2	684.5	5264.0	221.5	
Delay (s)	355.6	728.2		711.4	573.6		831.0	896.2	753.5	5315.5	273.0	
Level of Service	F	F		F	F		F	F	F	F	F	
Approach Delay (s)		716.3			593.8			826.7			1976.3	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	859.9	HCM Level of Service	F
HCM Volume to Capacity ratio	6.42		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	162.3%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Lane Group	EBT	WBT	SBL
Lane Group Flow (vph)	2801	3835	726
v/c Ratio	0.71	0.99	1.07
Control Delay	5.8	22.8	117.4
Queue Delay	8.2	0.0	0.0
Total Delay	14.0	22.8	117.4
Queue Length 50th (ft)	132	806	~297
Queue Length 95th (ft)	m33	678	#374
Internal Link Dist (ft)	95	905	166
Turn Bay Length (ft)			
Base Capacity (vph)	3973	3859	678
Starvation Cap Reductn	1162	0	0
Spillback Cap Reductn	67	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	1.00	0.99	1.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1450	1985	0	362	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		6.0	
Lane Util. Factor		0.91	0.91		0.94	
Frt		1.00	1.00		0.99	
Flt Protected		1.00	1.00		0.95	
Satd. Flow (prot)		5085	4940		4513	
Flt Permitted		1.00	1.00		0.95	
Satd. Flow (perm)		5085	4940		4513	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor (vph)	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	0	2801	3835	0	699	27
RTOR Reduction (vph)	0	0	0	0	1	0
Lane Group Flow (vph)	0	2801	3835	0	725	0
Heavy Vehicles (%)	0%	2%	5%	0%	12%	29%
Turn Type						
Protected Phases		6	2		4	
Permitted Phases						
Actuated Green, G (s)		125.0	125.0		24.0	
Effective Green, g (s)		125.0	125.0		24.0	
Actuated g/C Ratio		0.78	0.78		0.15	
Clearance Time (s)		5.0	5.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		3973	3859		677	
v/s Ratio Prot		0.55	c0.78		c0.16	
v/s Ratio Perm						
v/c Ratio		0.71	0.99		1.07	
Uniform Delay, d1		8.5	17.1		68.0	
Progression Factor		0.66	0.62		1.00	
Incremental Delay, d2		0.1	11.7		55.2	
Delay (s)		5.7	22.2		123.2	
Level of Service		A	C		F	
Approach Delay (s)		5.7	22.2		123.2	
Approach LOS		A	C		F	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	3254	2437	841
v/c Ratio	0.90	0.67	0.85
Control Delay	13.0	12.9	70.4
Queue Delay	4.1	0.0	0.0
Total Delay	17.2	12.9	70.4
Queue Length 50th (ft)	429	456	303
Queue Length 95th (ft)	m535	495	357
Internal Link Dist (ft)	905	75	179
Turn Bay Length (ft)			
Base Capacity (vph)	3616	3651	987
Starvation Cap Reductn	304	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.98	0.67	0.85

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1876	0	0	1405	428	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	6.0	
Lane Util. Factor	0.91			0.91	0.94	
Frt	1.00			1.00	0.98	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	4988			5036	4777	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	4988			5036	4777	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor (vph)	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	3254	0	0	2437	742	99
RTOR Reduction (vph)	0	0	0	0	2	0
Lane Group Flow (vph)	3254	0	0	2437	839	0
Heavy Vehicles (%)	4%	0%	0%	3%	6%	2%
Turn Type						
Protected Phases	6			2	4	
Permitted Phases						
Actuated Green, G (s)	116.0			116.0	33.0	
Effective Green, g (s)	116.0			116.0	33.0	
Actuated g/C Ratio	0.72			0.72	0.21	
Clearance Time (s)	5.0			5.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	3616			3651	985	
v/s Ratio Prot	c0.65			0.48	c0.18	
v/s Ratio Perm						
v/c Ratio	0.90			0.67	0.85	
Uniform Delay, d1	17.4			11.7	61.2	
Progression Factor	0.59			1.00	1.00	
Incremental Delay, d2	2.6			1.0	9.2	
Delay (s)	12.7			12.7	70.4	
Level of Service	B			B	E	
Approach Delay (s)	12.7			12.7	70.4	
Approach LOS	B			B	E	

Intersection Summary			
HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: EB NW 36 Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
NW 87 Avenue	II	40	90.4	210.0	300.4	1.00	12.0	F
NW 82 Avenue	II	40	47.2	154.2	201.4	0.51	9.1	F
NW 79 Avenue	II	39	28.1	678.9	707.0	0.26	1.3	F
SR 826 SB Off-Ramp	II	37	19.8	5.8	25.6	0.16	22.2	C
SR 826 NB Off-Ramp	II	40	21.5	13.0	34.5	0.19	19.5	D
Total	II		207.0	1061.9	1268.9	2.11	6.0	F

Arterial Level of Service: WB NW 36 Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
SR 826 NB Off-Ramp	II	38	24.0	12.9	36.9	0.21	20.3	D
SR 826 SB Off-Ramp	II	40	21.5	22.8	44.3	0.19	15.2	E
NW 79 Avenue	II	36	19.8	549.7	569.5	0.16	1.0	F
NW 82 Avenue	II	40	28.1	18.5	46.6	0.26	19.7	D
NW 87 Avenue	II	40	47.2	226.0	273.2	0.51	6.7	F
Total	II		140.6	829.9	970.5	1.32	4.9	F

Arterial Level of Service: EB NW 41 Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	40	13.1	6.3	19.4	0.11	21.1	D
Turnpike NB Off-Ramp	II	40	18.7	9.1	27.8	0.16	21.1	D
NW 115 Avenue	II	40	14.2	41.4	55.6	0.12	8.0	F
NW 114 Avenue	II	40	17.1	23.5	40.6	0.15	13.2	E
NW 112 Avenue	II	40	27.5	6.0	33.5	0.25	26.9	C
NW 107 Avenue	II	40	46.6	54.6	101.2	0.50	17.8	D
NW 102 Avenue	II	40	45.7	5.7	51.4	0.49	34.4	B
NW 97 Avenue	II	40	48.1	77.9	126.0	0.52	14.8	E
Total	II		231.0	224.5	455.5	2.31	18.2	D

Arterial Level of Service: WB NW 41 Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
NW 97 Avenue	II	40	90.4	53.1	143.5	1.00	25.2	C
NW 102 Avenue	II	40	48.1	70.2	118.3	0.52	15.7	E
NW 107 Avenue	II	40	45.7	181.4	227.1	0.49	7.8	F
NW 112 Avenue	II	40	46.6	168.3	214.9	0.50	8.4	F
NW 114 Avenue	II	40	27.5	176.5	204.0	0.25	4.4	F
NW 115 Avenue	II	40	17.1	14.0	31.1	0.15	17.2	D
Turnpike NB On-Ramp	II	40	14.2	16.9	31.1	0.12	14.3	E
Turnpike SB Off-Ramp	II	40	18.7	9.0	27.7	0.16	21.2	D
Total	II		308.3	689.4	997.7	3.20	11.5	F

Alternative 6A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	73	35	3	15	0	0	0	0	503	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0					5.0		4.0
Lane Util. Factor		0.95			1.00					0.94		1.00
Frt		0.95			1.00					1.00		0.85
Flt Protected		1.00			0.99					0.95		1.00
Satd. Flow (prot)		2734			1676					4545		944
Flt Permitted		1.00			0.96					0.95		1.00
Satd. Flow (perm)		2734			1627					4545		944
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	0	136	65	6	28	0	0	0	0	940	0	13
RTOR Reduction (vph)	0	31	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	170	0	0	34	0	0	0	0	940	0	13
Heavy Vehicles (%)	2%	3%	73%	0%	15%	3%	0%	0%	0%	12%	0%	71%
Turn Type				Perm						custom		Free
Protected Phases		6			2							
Permitted Phases				2						4		Free
Actuated Green, G (s)		33.1			33.1					19.9		63.0
Effective Green, g (s)		33.1			33.1					19.9		63.0
Actuated g/C Ratio		0.53			0.53					0.32		1.00
Clearance Time (s)		5.0			5.0					5.0		
Vehicle Extension (s)		3.0			3.0					3.0		
Lane Grp Cap (vph)		1436			855					1436		944
v/s Ratio Prot		c0.06										
v/s Ratio Perm					0.02					c0.21		0.01
v/c Ratio		0.12			0.04					0.65		0.01
Uniform Delay, d1		7.6			7.2					18.6		0.0
Progression Factor		1.00			1.00					1.00		1.00
Incremental Delay, d2		0.2			0.1					1.1		0.0
Delay (s)		7.7			7.3					19.7		0.0
Level of Service		A			A					B		A
Approach Delay (s)		7.7			7.3			0.0			19.4	
Approach LOS		A			A			A			B	

Intersection Summary			
HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	63.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	490	0	0	1114	1880	14	0	507	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0			5.0	4.0	5.0		5.0			
Lane Util. Factor	1.00	0.95			0.91	1.00	1.00		0.76			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1805	3223			5136	1568	1805		3646			
Flt Permitted	0.08	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	161	3223			5136	1568	1805		3646			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	170%	170%	170%	170%	170%	100%	170%	100%	170%	170%	170%	170%
Adj. Flow (vph)	81	868	0	0	1973	1958	25	0	898	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	302	0	0	0
Lane Group Flow (vph)	81	868	0	0	1973	1958	25	0	597	0	0	0
Heavy Vehicles (%)	0%	12%	0%	0%	1%	3%	0%	0%	1%	0%	0%	0%
Turn Type	pm+pt					Free	Prot		custom			
Protected Phases	1	6			2		4					
Permitted Phases	6					Free			4			
Actuated Green, G (s)	52.0	50.0			42.2	80.0	20.0		20.0			
Effective Green, g (s)	52.0	50.0			42.2	80.0	20.0		20.0			
Actuated g/C Ratio	0.65	0.62			0.53	1.00	0.25		0.25			
Clearance Time (s)	3.0	5.0			5.0		5.0		5.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	203	2014			2709	1568	451		912			
v/s Ratio Prot	0.02	0.27			0.38		0.01					
v/s Ratio Perm	0.24					c1.25			0.16			
v/c Ratio	0.40	0.43			0.73	1.25	0.06		0.65			
Uniform Delay, d1	20.5	7.7			14.5	40.0	22.8		26.9			
Progression Factor	1.00	1.00			1.03	1.00	1.00		1.00			
Incremental Delay, d2	1.3	0.7			0.7	114.3	0.2		3.6			
Delay (s)	21.8	8.4			15.7	154.3	23.1		30.5			
Level of Service	C	A			B	F	C		C			
Approach Delay (s)		9.5			84.7			30.3			0.0	
Approach LOS		A			F			C			A	

Intersection Summary			
HCM Average Control Delay	63.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	159	821	195	268	3051	78	253	3	237	20	1	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	1587		1770	1593	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3433	1587		1770	1593	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor (vph)	170%	170%	170%	170%	100%	170%	100%	170%	170%	170%	170%	170%
Adj. Flow (vph)	294	1517	360	495	3316	144	275	6	438	37	2	55
RTOR Reduction (vph)	0	0	215	0	0	29	0	236	0	0	54	0
Lane Group Flow (vph)	294	1517	145	495	3316	115	275	208	0	37	3	0
Turn Type	Prot		Perm	Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6			2						
Actuated Green, G (s)	14.0	62.0	62.0	56.0	104.0	104.0	21.9	21.9		4.1	4.1	
Effective Green, g (s)	14.0	62.0	62.0	56.0	104.0	104.0	21.9	21.9		4.1	4.1	
Actuated g/C Ratio	0.09	0.39	0.39	0.35	0.65	0.65	0.14	0.14		0.03	0.03	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	300	1970	613	1202	3305	1029	470	217		45	41	
v/s Ratio Prot	c0.09	0.30		0.14	c0.65		0.08	c0.13		c0.02	0.00	
v/s Ratio Perm			0.09			0.07						
v/c Ratio	0.98	0.77	0.24	0.41	1.00	0.11	0.59	0.96		0.82	0.08	
Uniform Delay, d1	72.9	42.8	33.0	39.5	28.0	10.6	64.8	68.6		77.6	76.1	
Progression Factor	1.04	0.93	1.32	0.78	0.24	0.12	1.00	1.00		1.00	1.00	
Incremental Delay, d2	43.1	1.7	0.2	0.0	5.5	0.0	1.9	49.7		70.2	0.9	
Delay (s)	119.1	41.3	43.9	30.9	12.2	1.3	66.6	118.3		147.8	77.0	
Level of Service	F	D	D	C	B	A	E	F		F	E	
Approach Delay (s)		52.3			14.2			98.5			104.8	
Approach LOS		D			B			F			F	

Intersection Summary			
HCM Average Control Delay	36.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	208	951	64	248	2655	220	346	225	90	171	267	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	5.0
Lane Util. Factor	0.97	0.91		0.97	0.91		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4919		3400	4997		1703	1776		1805	1881	1599
Flt Permitted	0.95	1.00		0.95	1.00		0.10	1.00		0.11	1.00	1.00
Satd. Flow (perm)	3433	4919		3400	4997		184	1776		211	1881	1599
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	170%	170%	170%	170%	100%	170%	100%	170%	170%	170%	170%	170%
Adj. Flow (vph)	368	1684	113	439	2766	390	360	398	159	303	473	641
RTOR Reduction (vph)	0	5	0	0	12	0	0	9	0	0	0	108
Lane Group Flow (vph)	368	1792	0	439	3144	0	360	548	0	303	473	533
Heavy Vehicles (%)	2%	3%	26%	3%	2%	1%	6%	1%	6%	0%	1%	1%
Turn Type	Prot			Prot			pm+pt			pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases							8			4		4
Actuated Green, G (s)	12.0	66.0		22.0	76.0		59.0	40.0		52.0	36.0	36.0
Effective Green, g (s)	12.0	66.0		22.0	76.0		59.0	40.0		52.0	36.0	36.0
Actuated g/C Ratio	0.08	0.41		0.14	0.48		0.37	0.25		0.32	0.22	0.22
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	257	2029		468	2374		258	444		228	423	360
v/s Ratio Prot	c0.11	0.36		0.13	c0.63		c0.17	0.31		0.13	0.25	
v/s Ratio Perm							c0.34			0.30		0.33
v/c Ratio	1.43	0.88		0.94	1.32		1.40	1.23		1.33	1.12	1.48
Uniform Delay, d1	74.0	43.4		68.3	42.0		50.4	60.0		47.4	62.0	62.0
Progression Factor	0.94	0.41		1.01	0.66		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	211.6	4.9		4.1	146.3		199.8	123.6		175.0	80.0	231.0
Delay (s)	281.0	22.9		73.2	174.0		250.2	183.6		222.4	142.0	293.0
Level of Service	F	C		E	F		F	F		F	F	F
Approach Delay (s)		66.8			161.7			209.8			227.5	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	153.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	130.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	243	259	3151	163	136	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0		7.0	7.0
Lane Util. Factor	0.97	1.00	0.91		0.97	0.91
Frt	1.00	1.00	0.99		0.93	0.85
Flt Protected	0.95	1.00	1.00		0.97	1.00
Satd. Flow (prot)	3502	1863	5032		3288	1455
Flt Permitted	0.95	1.00	1.00		0.97	1.00
Satd. Flow (perm)	3502	1863	5032		3288	1455
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	170%	170%	100%	170%	170%	170%
Adj. Flow (vph)	439	468	3352	295	246	434
RTOR Reduction (vph)	0	0	13	0	110	110
Lane Group Flow (vph)	439	468	3634	0	353	107
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%
Turn Type	Prot					Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	8.0	55.0	44.0		13.0	13.0
Effective Green, g (s)	8.0	55.0	44.0		13.0	13.0
Actuated g/C Ratio	0.10	0.69	0.55		0.16	0.16
Clearance Time (s)	3.0	5.0	5.0		7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	350	1281	2768		534	236
v/s Ratio Prot	c0.13	0.25	c0.72		c0.11	
v/s Ratio Perm						0.07
v/c Ratio	1.25	0.37	1.31		0.66	0.45
Uniform Delay, d1	36.0	5.2	18.0		31.4	30.3
Progression Factor	1.19	1.06	1.25		1.00	1.00
Incremental Delay, d2	124.8	0.4	141.1		6.3	6.2
Delay (s)	167.7	5.9	163.6		37.8	36.5
Level of Service	F	A	F		D	D
Approach Delay (s)		84.2	163.6		37.4	
Approach LOS		F	F		D	

Intersection Summary			
HCM Average Control Delay	133.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	103.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	168	677	201	429	2396	191	590	578	219	152	573	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3467	4841		3367	4989		3367	3574	1524	3400	3448	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3467	4841		3367	4989		3367	3574	1524	3400	3448	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor (vph)	170%	170%	170%	170%	100%	170%	100%	170%	170%	170%	170%	170%
Adj. Flow (vph)	291	1174	349	744	2445	331	602	1003	380	264	994	206
RTOR Reduction (vph)	0	34	0	0	11	0	0	0	162	0	11	0
Lane Group Flow (vph)	291	1489	0	744	2765	0	602	1003	218	264	1189	0
Heavy Vehicles (%)	1%	3%	5%	4%	2%	3%	4%	1%	6%	3%	2%	2%
Turn Type	Prot			Prot			Prot		custom	Prot		
Protected Phases	1	6		5	2		4	8		7	3	
Permitted Phases									4			
Actuated Green, G (s)	11.0	50.0		27.0	66.0		22.0	47.8	22.0	14.2	40.0	
Effective Green, g (s)	11.0	50.0		27.0	66.0		22.0	47.8	22.0	14.2	40.0	
Actuated g/C Ratio	0.07	0.31		0.17	0.41		0.14	0.30	0.14	0.09	0.25	
Clearance Time (s)	3.0	6.0		3.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	238	1513		568	2058		463	1068	210	302	862	
v/s Ratio Prot	c0.08	0.31		0.22	c0.55		c0.18	0.28		0.08	c0.34	
v/s Ratio Perm									0.14			
v/c Ratio	1.22	0.98		1.31	1.34		1.30	0.94	1.04	0.87	1.38	
Uniform Delay, d1	74.5	54.6		66.5	47.0		69.0	54.7	69.0	72.0	60.0	
Progression Factor	0.91	0.65		0.91	0.90		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	120.8	14.6		140.6	155.0		150.2	14.9	72.2	23.2	177.9	
Delay (s)	188.4	50.2		201.0	197.1		219.2	69.6	141.2	95.3	237.9	
Level of Service	F	D		F	F		F	E	F	F	F	
Approach Delay (s)		72.4			197.9			128.7			212.1	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	158.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	130.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	216	1171	82	77	3103	220	38	27	51	125	46	226
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0			5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	0.97	0.91		0.97	0.91			1.00	1.00	0.97	0.95	0.95
Frt	1.00	0.99		1.00	0.98			1.00	0.85	1.00	0.90	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	4993		3502	5058			1846	1583	3502	1603	1504
Flt Permitted	0.95	1.00		0.95	1.00			0.68	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	4993		3502	5058			1293	1583	3502	1603	1504
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor (vph)	170%	170%	170%	170%	100%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	379	2052	144	135	3199	386	67	47	89	219	81	396
RTOR Reduction (vph)	0	5	0	0	9	0	0	0	83	0	45	96
Lane Group Flow (vph)	379	2191	0	135	3576	0	0	114	6	219	198	138
Heavy Vehicles (%)	1%	3%	1%	0%	1%	0%	0%	0%	2%	0%	0%	2%
Turn Type	Prot			Prot			Perm		Perm	Prot		Perm
Protected Phases	1	6		5	2			4		3	8	
Permitted Phases							4		4			8
Actuated Green, G (s)	14.0	104.7		10.3	101.0			11.0	11.0	17.0	32.0	32.0
Effective Green, g (s)	14.0	104.7		10.3	101.0			11.0	11.0	17.0	32.0	32.0
Actuated g/C Ratio	0.09	0.65		0.06	0.63			0.07	0.07	0.11	0.20	0.20
Clearance Time (s)	3.0	5.0		3.0	5.0			5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	303	3267		225	3193			89	109	372	321	301
v/s Ratio Prot	c0.11	0.44		0.04	c0.71					0.06	c0.12	
v/s Ratio Perm								c0.09	0.00			0.09
v/c Ratio	1.25	0.67		0.60	1.12			1.28	0.06	0.59	0.62	0.46
Uniform Delay, d1	73.0	17.0		72.8	29.5			74.5	69.6	68.2	58.4	56.4
Progression Factor	0.65	0.28		1.25	0.25			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	131.1	0.8		1.7	55.9			188.3	0.2	6.7	8.6	5.0
Delay (s)	178.5	5.6		92.9	63.1			262.8	69.9	74.9	67.0	61.3
Level of Service	F	A		F	E			F	E	E	E	E
Approach Delay (s)		31.0			64.2			178.2			67.6	
Approach LOS		C			E			F			E	

Intersection Summary			
HCM Average Control Delay	55.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	113.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	822	133	343	1321	209	472	611	198	216	458	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3467	4903		3467	5136	1615	3400	3574	1538	3400	3404	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3467	4903		3467	5136	1615	3400	3574	1538	3400	3404	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	100%	170%	170%	170%	170%	170%
Adj. Flow (vph)	204	1456	236	607	2339	370	492	1082	351	382	811	255
RTOR Reduction (vph)	0	14	0	0	0	68	0	0	97	0	19	0
Lane Group Flow (vph)	204	1678	0	607	2339	302	492	1082	254	382	1047	0
Heavy Vehicles (%)	1%	4%	1%	1%	1%	0%	3%	1%	5%	3%	2%	3%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			
Actuated Green, G (s)	9.0	49.0		26.0	66.0	66.0	21.0	48.0	48.0	17.0	44.0	
Effective Green, g (s)	9.0	49.0		26.0	66.0	66.0	21.0	48.0	48.0	17.0	44.0	
Actuated g/C Ratio	0.06	0.31		0.16	0.41	0.41	0.13	0.30	0.30	0.11	0.28	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	195	1502		563	2119	666	446	1072	461	361	936	
v/s Ratio Prot	0.06	0.34		c0.18	c0.46		c0.14	0.30		0.11	c0.31	
v/s Ratio Perm						0.19			0.16			
v/c Ratio	1.05	1.12		1.08	1.10	0.45	1.10	1.01	0.55	1.06	1.12	
Uniform Delay, d1	75.5	55.5		67.0	47.0	34.0	69.5	56.0	47.0	71.5	58.0	
Progression Factor	1.18	0.84		0.81	0.41	0.21	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	68.4	60.3		38.8	47.5	0.2	73.6	29.8	1.4	63.5	67.7	
Delay (s)	157.4	106.9		92.8	66.7	7.2	143.1	85.8	48.4	135.0	125.7	
Level of Service	F	F		F	E	A	F	F	D	F	F	
Approach Delay (s)		112.3			64.8			93.6			128.2	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	92.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	108.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	199	1008	215	460	1521	99	399	832	559	104	794	259
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.91	
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3099	4802		3273	4975		3467	3406	1568	3467	4792	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3099	4802		3273	4975		3467	3406	1568	3467	4792	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	364	1843	393	841	2780	181	729	1521	1022	190	1451	473
RTOR Reduction (vph)	0	21	0	0	5	0	0	0	232	0	36	0
Lane Group Flow (vph)	364	2215	0	841	2956	0	729	1521	790	190	1888	0
Heavy Vehicles (%)	13%	5%	6%	7%	3%	8%	1%	6%	3%	1%	4%	5%
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	14.0	53.0		27.0	66.0		23.0	57.0	57.0	7.0	41.0	
Effective Green, g (s)	14.0	53.0		27.0	66.0		23.0	57.0	57.0	7.0	41.0	
Actuated g/C Ratio	0.09	0.33		0.17	0.41		0.14	0.36	0.36	0.04	0.26	
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	271	1591		552	2052		498	1213	559	152	1228	
v/s Ratio Prot	0.12	c0.46		c0.26	c0.59		c0.21	0.45		0.05	c0.39	
v/s Ratio Perm									0.50			
v/c Ratio	1.34	1.39		1.52	1.44		1.46	1.25	1.41	1.25	1.54	
Uniform Delay, d1	73.0	53.5		66.5	47.0		68.5	51.5	51.5	76.5	59.5	
Progression Factor	0.73	0.60		0.94	0.58		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	165.9	178.4		240.6	199.9		219.6	121.2	196.6	155.4	245.8	
Delay (s)	219.4	210.5		302.9	227.2		288.1	172.7	248.1	231.9	305.3	
Level of Service	F	F		F	F		F	F	F	F	F	
Approach Delay (s)		211.7			244.0			221.9			298.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	240.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	133.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	2019	49	151	1631	29	97	67	154	58	132	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.90		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	5010		1719	5019		1736	1605		1805	1760	
Flt Permitted	0.05	1.00		0.05	1.00		0.26	1.00		0.20	1.00	
Satd. Flow (perm)	90	5010		88	5019		482	1605		376	1760	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	145	3538	86	265	2858	51	170	117	270	102	231	112
RTOR Reduction (vph)	0	2	0	0	1	0	0	52	0	0	11	0
Lane Group Flow (vph)	145	3622	0	265	2908	0	170	335	0	102	332	0
Heavy Vehicles (%)	5%	3%	10%	5%	3%	7%	4%	6%	6%	0%	3%	2%
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	90.0	90.0		96.0	94.0		43.0	43.0		43.0	43.0	
Effective Green, g (s)	90.0	90.0		96.0	94.0		43.0	43.0		43.0	43.0	
Actuated g/C Ratio	0.56	0.56		0.60	0.59		0.27	0.27		0.27	0.27	
Clearance Time (s)	3.0	5.0		3.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	152	2818		196	2949		130	431		101	473	
v/s Ratio Prot	0.06	c0.72		c0.12	0.58			0.21			0.19	
v/s Ratio Perm	0.47			c0.69			c0.35			0.27		
v/c Ratio	0.95	1.29		1.35	0.99		1.31	0.78		1.01	0.70	
Uniform Delay, d1	50.7	35.0		69.1	32.4		58.5	54.1		58.5	52.7	
Progression Factor	1.49	0.73		0.74	0.46		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.6	128.7		161.5	2.7		183.0	8.6		92.3	4.7	
Delay (s)	88.0	154.2		212.5	17.7		241.5	62.7		150.8	57.4	
Level of Service	F	F		F	B		F	E		F	E	
Approach Delay (s)		151.7			34.0			117.2			78.8	
Approach LOS		F			C			F			E	

Intersection Summary			
HCM Average Control Delay	98.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	126.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	2053	30	354	1705	351	99	119	592	592	229	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.91		0.97	0.91		1.00	0.95	0.95	0.91	0.91	
Frt	1.00	1.00		1.00	0.97		1.00	0.90	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	0.98	
Satd. Flow (prot)	1752	5074		3213	4798		1787	1556	1490	1595	3182	
Flt Permitted	0.95	1.00		0.95	1.00		0.26	1.00	1.00	0.07	0.60	
Satd. Flow (perm)	1752	5074		3213	4798		497	1556	1490	118	1965	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	123	3674	54	633	3051	628	177	213	1059	1059	410	97
RTOR Reduction (vph)	0	1	0	0	20	0	0	46	115	0	5	0
Lane Group Flow (vph)	123	3727	0	633	3660	0	177	601	510	529	1032	0
Heavy Vehicles (%)	3%	2%	3%	9%	5%	7%	1%	7%	3%	3%	7%	2%
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	1	6		5	2			4			3	
Permitted Phases							4		4	3		
Actuated Green, G (s)	7.0	48.0		13.0	56.0		22.0	22.0	22.0	57.0	57.0	
Effective Green, g (s)	7.0	48.0		13.0	56.0		22.0	22.0	22.0	57.0	57.0	
Actuated g/C Ratio	0.04	0.30		0.08	0.35		0.14	0.14	0.14	0.36	0.36	
Clearance Time (s)	3.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	77	1522		261	1679		68	214	205	42	700	
v/s Ratio Prot	0.07	c0.73		0.20	c0.76			c0.39				
v/s Ratio Perm							0.36		0.34	c4.49	0.53	
v/c Ratio	1.60	2.45		2.43	2.18		2.60	2.81	2.49	12.60	11.04dl	
Uniform Delay, d1	76.5	56.0		73.5	52.0		69.0	69.0	69.0	51.5	51.5	
Progression Factor	1.06	1.36		0.86	0.80		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	274.3	652.2		648.0	531.9		762.0	827.2	684.5	5264.0	221.5	
Delay (s)	355.6	728.2		711.4	573.6		831.0	896.2	753.5	5315.5	273.0	
Level of Service	F	F		F	F		F	F	F	F	F	
Approach Delay (s)		716.3			593.8			826.7			1976.3	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	859.9	HCM Level of Service	F
HCM Volume to Capacity ratio	6.42		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	162.3%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1450	1985	0	362	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		6.0	
Lane Util. Factor		0.91	0.91		0.94	
Frt		1.00	1.00		0.99	
Flt Protected		1.00	1.00		0.95	
Satd. Flow (prot)		5085	4940		4513	
Flt Permitted		1.00	1.00		0.95	
Satd. Flow (perm)		5085	4940		4513	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor (vph)	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	0	2801	3835	0	699	27
RTOR Reduction (vph)	0	0	0	0	1	0
Lane Group Flow (vph)	0	2801	3835	0	725	0
Heavy Vehicles (%)	0%	2%	5%	0%	12%	29%
Turn Type						
Protected Phases		6	2		4	
Permitted Phases						
Actuated Green, G (s)		125.0	125.0		24.0	
Effective Green, g (s)		125.0	125.0		24.0	
Actuated g/C Ratio		0.78	0.78		0.15	
Clearance Time (s)		5.0	5.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		3973	3859		677	
v/s Ratio Prot		0.55	c0.78		c0.16	
v/s Ratio Perm						
v/c Ratio		0.71	0.99		1.07	
Uniform Delay, d1		8.5	17.1		68.0	
Progression Factor		0.66	0.62		1.00	
Incremental Delay, d2		0.1	11.7		55.2	
Delay (s)		5.7	22.2		123.2	
Level of Service		A	C		F	
Approach Delay (s)		5.7	22.2		123.2	
Approach LOS		A	C		F	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1876	0	0	1405	428	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	6.0	
Lane Util. Factor	0.91			0.91	0.94	
Frt	1.00			1.00	0.98	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	4988			5036	4777	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	4988			5036	4777	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor (vph)	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	3254	0	0	2437	742	99
RTOR Reduction (vph)	0	0	0	0	2	0
Lane Group Flow (vph)	3254	0	0	2437	839	0
Heavy Vehicles (%)	4%	0%	0%	3%	6%	2%
Turn Type						
Protected Phases	6			2	4	
Permitted Phases						
Actuated Green, G (s)	116.0			116.0	33.0	
Effective Green, g (s)	116.0			116.0	33.0	
Actuated g/C Ratio	0.72			0.72	0.21	
Clearance Time (s)	5.0			5.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	3616			3651	985	
v/s Ratio Prot	c0.65			0.48	c0.18	
v/s Ratio Perm						
v/c Ratio	0.90			0.67	0.85	
Uniform Delay, d1	17.4			11.7	61.2	
Progression Factor	0.59			1.00	1.00	
Incremental Delay, d2	2.6			1.0	9.2	
Delay (s)	12.7			12.7	70.4	
Level of Service	B			B	E	
Approach Delay (s)	12.7			12.7	70.4	
Approach LOS	B			B	E	

Intersection Summary			
HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: EB NW 36 Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
NW 87 Avenue	II	40	90.4	204.5	294.9	1.00	12.3	F
NW 82 Avenue	II	40	47.2	154.5	201.7	0.51	9.1	F
NW 79 Avenue	II	39	28.1	678.9	707.0	0.26	1.3	F
SR 826 SB Off-Ramp	II	37	19.8	5.8	25.6	0.16	22.2	C
SR 826 NB Off-Ramp	II	40	21.5	13.0	34.5	0.19	19.5	D
Total	II		207.0	1056.7	1263.7	2.11	6.0	F

Arterial Level of Service: WB NW 36 Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
SR 826 NB Off-Ramp	II	38	24.0	12.9	36.9	0.21	20.3	D
SR 826 SB Off-Ramp	II	40	21.5	22.8	44.3	0.19	15.2	E
NW 79 Avenue	II	36	19.8	549.7	569.5	0.16	1.0	F
NW 82 Avenue	II	40	28.1	18.5	46.6	0.26	19.7	D
NW 87 Avenue	II	40	47.2	225.2	272.4	0.51	6.7	F
Total	II		140.6	829.1	969.7	1.32	4.9	F

Arterial Level of Service: EB NW 41 Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	40	13.1	6.3	19.4	0.11	21.1	D
Turnpike NB Off-Ramp	II	40	18.7	8.5	27.2	0.16	21.6	D
NW 115 Avenue	II	40	14.2	41.9	56.1	0.12	7.9	F
NW 114 Avenue	II	40	17.1	23.0	40.1	0.15	13.4	E
NW 112 Avenue	II	40	27.5	6.0	33.5	0.25	26.9	C
NW 107 Avenue	II	40	46.6	49.3	95.9	0.50	18.8	D
NW 102 Avenue	II	40	45.7	5.6	51.3	0.49	34.5	B
NW 97 Avenue	II	40	48.1	102.5	150.6	0.52	12.4	F
Total	II		231.0	243.1	474.1	2.31	17.5	D

Arterial Level of Service: WB NW 41 Street

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
NW 97 Avenue	II	40	90.4	68.5	158.9	1.00	22.8	C
NW 102 Avenue	II	40	48.1	67.1	115.2	0.52	16.2	E
NW 107 Avenue	II	40	45.7	188.9	234.6	0.49	7.5	F
NW 112 Avenue	II	40	46.6	164.4	211.0	0.50	8.5	F
NW 114 Avenue	II	40	27.5	172.8	200.3	0.25	4.5	F
NW 115 Avenue	II	40	17.1	13.6	30.7	0.15	17.5	D
Turnpike NB On-Ramp	II	40	14.2	15.7	29.9	0.12	14.9	E
Turnpike SB Off-Ramp	II	40	18.7	9.0	27.7	0.16	21.2	D
Total	II		308.3	700.0	1008.3	3.20	11.4	F

Appendix K

2040 Total Delay Analysis

For No-Build, 5A and 6A Alternatives

62: NW 41 Street & Performance by movement

Movement	EBT	WBT	NER	All
Total Delay (hr)	0.1	122.5	0.1	122.7
Delay / Veh (s)	1.8	1395.7	0.6	479.0
Total Stops	8	131	8	147
Travel Dist (mi)	14.1	16.5	8.9	39.5
Travel Time (hr)	0.5	122.9	0.6	124.1
Avg Speed (mph)	27	0	15	1
Fuel Used (gal)	0.8	28.4	0.2	29.3
HC Emissions (g)	11	45	1	57
CO Emissions (g)	565	1940	25	2530
NOx Emissions (g)	37	46	2	86
Vehicles Entered	188	336	417	941
Vehicles Exited	191	296	416	903
Hourly Exit Rate	191	296	416	903
Input Volume	671	3617	1318	5606
% of Volume	28	8	32	16
Denied Entry Before	0	0	0	0
Denied Entry After	0	202	0	202

Total Network Performance

Total Delay (hr)	13784.6
Delay / Veh (s)	5187.1
Total Stops	24354
Travel Dist (mi)	7731.5
Travel Time (hr)	14014.1
Avg Speed (mph)	2
Fuel Used (gal)	3396.3
HC Emissions (g)	21191
CO Emissions (g)	504648
NOx Emissions (g)	29606
Vehicles Entered	11122
Vehicles Exited	8014
Hourly Exit Rate	8014
Input Volume	237268
% of Volume	3
Denied Entry Before	329
Denied Entry After	25096

62: NW 41 Street & Performance by movement

Movement	EBT	WBT	NER	All
Total Delay (hr)	0.3	121.1	0.2	121.7
Delay / Veh (s)	2.6	227.1	1.3	141.2
Total Stops	18	1034	80	1132
Travel Dist (mi)	35.1	102.3	14.6	152.0
Travel Time (hr)	1.5	123.7	1.2	126.4
Avg Speed (mph)	23	5	12	7
Fuel Used (gal)	2.1	30.9	0.3	33.4
HC Emissions (g)	30	55	2	86
CO Emissions (g)	1537	2503	46	4086
NOx Emissions (g)	102	169	4	275
Vehicles Entered	469	1929	711	3109
Vehicles Exited	470	1912	712	3094
Hourly Exit Rate	470	1912	712	3094
Input Volume	671	3611	1318	5600
% of Volume	70	53	54	55
Denied Entry Before	0	1	0	1
Denied Entry After	0	244	0	244

Total Network Performance

Total Delay (hr)	11723.1
Delay / Veh (s)	3092.3
Total Stops	35109
Travel Dist (mi)	10968.0
Travel Time (hr)	12051.3
Avg Speed (mph)	4
Fuel Used (gal)	3051.0
HC Emissions (g)	20618
CO Emissions (g)	514446
NOx Emissions (g)	33653
Vehicles Entered	14879
Vehicles Exited	12413
Hourly Exit Rate	12413
Input Volume	236124
% of Volume	5
Denied Entry Before	365
Denied Entry After	21299

62: NW 41 Street & Performance by movement

Movement	EBT	WBT	NER	All
Total Delay (hr)	0.3	128.9	0.2	129.4
Delay / Veh (s)	2.5	239.2	1.1	149.3
Total Stops	24	1135	61	1220
Travel Dist (mi)	34.5	102.6	14.6	151.7
Travel Time (hr)	1.5	131.5	1.1	134.1
Avg Speed (mph)	23	5	13	6
Fuel Used (gal)	2.1	32.7	0.3	35.1
HC Emissions (g)	28	55	2	85
CO Emissions (g)	1490	2565	49	4103
NOx Emissions (g)	97	167	4	269
Vehicles Entered	466	1949	713	3128
Vehicles Exited	466	1931	714	3111
Hourly Exit Rate	466	1931	714	3111
Input Volume	671	3611	1318	5600
% of Volume	69	53	54	56
Denied Entry Before	0	0	0	0
Denied Entry After	0	239	0	239

Total Network Performance

Total Delay (hr)	10951.2
Delay / Veh (s)	2635.8
Total Stops	41612
Travel Dist (mi)	12417.9
Travel Time (hr)	11322.1
Avg Speed (mph)	5
Fuel Used (gal)	2927.8
HC Emissions (g)	20827
CO Emissions (g)	526214
NOx Emissions (g)	36357
Vehicles Entered	16203
Vehicles Exited	13708
Hourly Exit Rate	13708
Input Volume	235395
% of Volume	6
Denied Entry Before	376
Denied Entry After	19653

Appendix L

2040 Weaving and Queue Analyses

For Alternative 5A

HCS 2010: Freeway Weaving Release 6.1

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JS
Agency/Co.:	Marlin
Date Performed:	3/22/2013
Analysis Time Period:	AM Peak Hour
Freeway/Dir of Travel:	Turnpike NB Off-Ramp
Weaving Location:	NB off-ramp
Analysis Year:	2040
Description:	Weaving Segment

Inputs

Segment Type	C-D Roadway/ Multilane Highways	
Weaving configuration	Two-Sided	
Number of lanes, N	3	ln
Weaving segment length, LS	470	ft
Freeway free-flow speed, FFS	60	mi/h
Minimum segment speed, SMIN	15	mi/h
Freeway maximum capacity, cIFL	2300	pc/h/ln
Terrain type	Level	
Grade		%
Length		mi

Conversion to pc/h Under Base Conditions

	Volume Components				
	VFF	VRF	VFR	VRR	
Volume, V	2062	51	200	244	veh/h
Peak hour factor, PHF	0.96	0.96	0.96	0.96	
Peak 15-min volume, v15	537	13	52	64	
Trucks and buses	7	7	7	7	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.966	0.966	0.966	0.966	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	2223	55	216	263	pc/h
Volume ratio, VR		0.095			

Configuration Characteristics

Number of maneuver lanes, NWL	0	ln
Interchange density, ID	2.00	int/mi
Minimum RF lane changes, LCRF		lc/pc
Minimum FR lane changes, LCFR		lc/pc
Minimum RR lane changes, LCRR	3	lc/pc
Minimum weaving lane changes, LCMIN	789	lc/h
Weaving lane changes, LCW	899	lc/h
Non-weaving vehicle index, INW	234	
Non-weaving lane change, LCNW	191	lc/h
Total lane changes, LCALL	1090	lc/h

Weaving and Non-Weaving Speeds

Weaving intensity factor, W	0.439

Average weaving speed, SW	46.3	mi/h
Average non-weaving speed, SNW	49.9	mi/h

__________Weaving Segment Speed, Density, Level of Service and Capacity__________

Weaving segment speed, S	49.5	mi/h
Weaving segment density, D	18.6	pc/mi/ln
Level of service, LOS	B	
Weaving segment v/c ratio	0.503	
Weaving segment flow rate, v	2757	pc/h
Weaving segment capacity, cW	5301	veh/h

__________________________Limitations on Weaving Segments__________________________

If limit reached, see note.

	Minimum	Maximum	Actual	Note
Weaving length (ft)	300	6627	470	a,b
		Maximum	Analyzed	
Density-based capacty, cIWL (pc/h/ln)		2300	1829	c
		Maximum	Analyzed	
v/c ratio		1.00	0.503	d

Notes:

a. In weaving segments shorter than 300 ft, weaving vehicles are assumed to make only necessary lane changes.

b. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments."

c. The density-based capacity exceeds the capacity of a basic freeway segment, under equivalent ideal conditions.

d. Volumes exceed the weaving segment capacity. The level of service is F.

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	46	3197	839	691	305	2126
v/c Ratio	0.14	1.74	0.37	0.47	0.49	1.66
Control Delay	3.4	353.2	14.0	2.1	25.9	323.5
Queue Delay	0.0	10.8	0.0	0.0	0.0	23.9
Total Delay	3.4	364.0	14.0	2.1	25.9	347.5
Queue Length 50th (ft)	5	~1437	79	20	133	~778
Queue Length 95th (ft)	m6	m#1391	m139	m47	211	#892
Internal Link Dist (ft)		442	668		1069	
Turn Bay Length (ft)	300			400		
Base Capacity (vph)	330	1834	2287	1468	626	1284
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	25	0	0	0	40
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	1.77	0.37	0.47	0.49	1.71

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	1824	0	0	479	394	30	244	1213	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0			5.0	4.0		5.0	5.0			
Lane Util. Factor	1.00	0.95			0.91	1.00		1.00	0.76			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (prot)	1570	3438			4893	1468		1761	3610			
Flt Permitted	0.26	1.00			1.00	1.00		0.99	1.00			
Satd. Flow (perm)	437	3438			4893	1468		1761	3610			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor (vph)	170%	170%	170%	170%	170%	170%	170%	100%	170%	170%	170%	170%
Adj. Flow (vph)	46	3197	0	0	839	691	53	252	2126	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	46	3197	0	0	839	691	0	305	2126	0	0	0
Heavy Vehicles (%)	15%	5%	0%	0%	6%	10%	40%	0%	2%	0%	0%	0%
Turn Type	pm+pt					Free	Split		Prot			
Protected Phases	1	6			2		4	4	4			
Permitted Phases	6					Free						
Actuated Green, G (s)	48.0	48.0			40.9	90.0		32.0	32.0			
Effective Green, g (s)	48.0	48.0			40.9	90.0		32.0	32.0			
Actuated g/C Ratio	0.53	0.53			0.45	1.00		0.36	0.36			
Clearance Time (s)	3.0	5.0			5.0			5.0	5.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	285	1834			2224	1468		626	1284			
v/s Ratio Prot	0.01	c0.93			0.17			0.17	c0.59			
v/s Ratio Perm	0.08					0.47						
v/c Ratio	0.16	1.74			0.38	0.47		0.49	1.66			
Uniform Delay, d1	10.5	21.0			16.2	0.0		22.6	29.0			
Progression Factor	0.34	0.51			0.85	1.00		1.00	1.00			
Incremental Delay, d2	0.1	335.0			0.4	0.9		2.7	298.6			
Delay (s)	3.7	345.7			14.1	0.9		25.3	327.6			
Level of Service	A	F			B	A		C	F			
Approach Delay (s)		340.9			8.2			289.7			0.0	
Approach LOS		F			A			F			A	

Intersection Summary			
HCM Average Control Delay	252.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	142.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Appendix M

Cost Estimates

COST ESTIMATE FOR ALTERNATIVE # 5

Description	Unit	Quantity	Unit Price	Amount	Total Estimate
New Construction 1 lane roadway connection btwn NW 117 Ave & TPK Off Ramp NB to 41 St	mi	0.95	2,100,000	1,995,000	
Mill & Resurface for 1 additional lane Urban Arterial	mi	2.78	190,000	528,200	
Modification of Intersection NW 34 St & NW 117 Ave(Signing and Pavement Markings)	LS			12,000	
Retiming Traffic Signal and Signing & Pavement Marking Modification at NW 41 St & NW 117 Ave	LS			30,000	
Sub-Total					2,565,200
Total Roadway Cost includng 15 % Contigencies					2,949,980
Rounded Total Cost					**$2,950,000**

COST ESTIMATE FOR ALTERNATIVE # 5A

Description	Unit	Quantity	Unit Price	Amount	Total Estimate
New Construction 1 lane roadway connection btwn NW 117 Ave & TPK Off Ramp NB to 41 St	mi	0.95	2,100,000	1,995,000	
Mill & Resurface for 1 additional lane Urban Arterial	mi	2.78	190,000	528,200	
Modification of Intersection NW 34 St & NW 117 Ave(Signing and Pavement Markings)	LS	1	12,000	12,000	
Retiming Traffic Signal and Signing & Pavement Marking Modification at NW 41 St & NW 117 Ave	LS			30,000	
Update or Retiming Traffic Signal per intersection	Unit	6	3,500	21,000	
New Construction 1 lane (Auxiliaries) roadway for on Urban Arterial (3,715 Feet)	mi	0.7	2,100,000	1,470,000	
Sub-Total					4,056,200
Total Roadway Cost includng 15 % Contigencies					4,664,630
Rounded Total Cost					**$4,660,000**

COST ESTIMATE FOR ALTERNATIVE # 6

Description	Unit	Quantity	Unit Price	Amount	Total Estimate
Roadway Costs					
New Construction 1 lane roadway on Urnan arterial	mi	1	2,100,000	2,310,000	
Structural Costs					
New Bridge Construction	*	*	*	2,174,895	
Sub-Total					4,484,895
Total Roadway and Structural Costs includng 15 % Contigencies					5,157,629
Rounded Total Cost					**$5,160,000**

COST ESTIMATE FOR ALTERNATIVE # 6A

Description	Unit	Quantity	Unit Price	Amount	Total Estimate
Roadway Costs					
New Construction 1 lane roadway on Urnan arterial	mi	1.10	$2,100,000	$2,310,000	
Structural Costs					
New Bridge Construction	*	*	*	$2,174,895	
Update or Retiming Traffic Signal per intersection	Unit	6	$3,500	$21,000	
New Construction 1 lane (Auxiliaries) roadway for on Urban Arterial (3,715 Feet)	mi	0.7	$2,100,000	$1,470,000	
Sub-Total					$5,975,895
Total Roadway and Structural Costs includng 15 % Contigencies					$6,872,279
Rounded Total Cost					**$6,870,000**

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