TRAFFIC IMPACT ANALYSIS

MSMC Cancer Center

Miami-Dade County
Miami Beach, Florida

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EXECUTIVE SUMMARY

Langan Engineering & Environmental Services, Inc. was retained to prepare a traffic-impact analysis for the MSMC Cancer Center development that will be built in Miami Beach, Florida. The proposed development will comprise a 216,558 square-foot cancer center (hospital) to be built by 2025 and will be located in the southwest corner of the existing Mount Sinai Medical Center Campus. We analyzed four signalized intersection for the 2025 build conditions. The peak-hour traffic-impact analyses with the proposed development's impacts in 2025 yielded the following results:

- All study intersections are expected to operate within their adopted Level of Service (LOS) during the morning and afternoon peak-hours with the project's impacts.
- We optimized the signal timing, without changing the cycle length, of Alton Road and 43rd Street during the morning and afternoon peak hour periods, and Alton Road and 41st Street during the afternoon peak hour period to mitigate the delay for the movements and approaches impacted by the proposed development.
- As this project is located approximately 0.4 miles within the Mount Sinai Medical Center Campus, traffic from the proposed development will access the site through the existing connections to 43rd Street. The main access to public roads is through 43rd Street and Alton Road, which operates at LOS D or better during the morning and afternoon peak hours.
- Queueing along the on-ramp and off-ramp to SR 112/I-195 will not exceed 11 vehicles during any 15-minute period during the peak-hours.
- Queuing along the northbound approaches of the intersections of Alton Road at 43rd and 41st streets are exceeding capacity in the existing conditions. The proposed signal timing optimization at these intersections will mitigate the expected queues at these approaches.
- The proposed gate-controlled access points will not cause entering traffic to spillback onto the adjacent internal roadways.

We conducted intersection-capacity analyses for the existing, no build (future without project) and build (future with project) conditions. The proposed development is expected to generate 2,038 daily, 156 morning peak-hour, and 163 afternoon peak-hour net-new trips.

INTRODUCTION

Langan was retained to prepare this traffic impact-analysis report for the proposed MSMC Cancer Center development that will be built in Miami Beach, Florida. The approximately 6.4-acre site lies within one parcel in the southwest corner of the existing Mount Sinai Medical Center Campus. The proposed development comprises a 216,558 square feet cancer center (hospital) to be built by 2025. **Appendix A** contains the figures of this report and **Figure 1** illustrates the site location.

We analyzed four signalized intersections during the morning and afternoon peak hours, and found that all four are expected to operate within their adopted LOS during the morning and afternoon peak-hours with the proposed project's impacts. We optimized the signal timing, without changing the cycle length, of Alton Road and 43rd Street during the morning and afternoon peak hour periods, and Alton Road and 41st Street during the afternoon peak hour period to mitigate the delay for the movements and approaches impacted by the proposed development. The queuing analysis along the on/off ramp to I-195/SR 112 shows that the existing queues and expected queues will not exceed their storage capacity. The queues of the northbound approaches at Alton Road and 43rd and 41st streets are exceeding capacity in the existing conditions and the proposed signal timing optimization at these intersections will mitigate the existing and expected queues. The proposed gate-controlled driveway connections will have sufficient vehicle-stacking storage to accommodate the expected morning and afternoon peak-hour queues due to entering traffic. This report presents the traffic-data and traffic-impact analysis for this proposed development.

Project Description

The proposed development is located at the furthest point within the campus, and is approximately 0.4 miles from the nearest public road. The main access to enter the campus is through 43rd Street and Alton Road, and egress is available via 43rd Street and Alton Road, or a dedicated on-ramp with direct access to I-195 westbound. **Appendix B** contains copies of the site plans showing the proposed development program and a list of the development's parcel (Folio No. 02-3222-011-0360). Once within the campus, the development will be accessible through an internal road that leads to an on-street parking lot and parking garage, as well as a roundabout drop-off to the east of the building.

Scope of Study

Langan undertook the following steps to prepare this study in accordance with the methodology accepted by Miami-Dade County Department of Transportation and Public Works Traffic Division. **Appendix C** contains a copy of the methodology letter accepted by county staff.

- Collected morning (7 to 9 AM) and afternoon (4 to 6 PM) peak-hour vehicle turning-movement volumes at the following study intersections:
    - Alton Road & 47th Street (signalized)
    - Alton Road & 43rd Street (signalized)
    - Alton Road & 41st Street (signalized)
    - Alton Road & Chase Avenue (signalized)
- Collected morning (6 to 10 AM) and afternoon (3 to 7 PM) queueing data at the following locations
    - SR112/I-195 westbound on-ramp
    - SR 112/I-195 eastbound off-ramp
    - Northbound approach at Alton Road & 43rd Street
    - Northbound approach at Alton Road & 41st Street
- Developed a COVID-adjustment factor by comparing early 2020 traffic data to 2022 traffic data along the segment of the on-ramp to westbound I-195 to convert the traffic data into peak-season volumes.
- The COVID-adjustment factor calculated for the morning and afternoon peak-hours were 0.90 and 0.76, respectively. Since the COVID-adjustment factor was less than one, we applied the FDOT peak season conversion factor of 1.02 since this corresponds to when the data was collected.
- Prepared trip-generation estimates for the proposed development, based on accepted trip-generation rates developed by the Institute of Transportation Engineers (ITE).
- Calculated a growth rate for background traffic by using FDOT historical data from traffic-count stations near the project.
- Developed trip-distribution estimates for the project, based on the cardinal distribution for the corresponding Traffic Analysis Zone of the Miami-Dade County 2045 Long Range Transportation Plan (LRTP). A computer program used to develop the *2045 LRTP Directional Distribution Report* generates directional distributions for each TAZ for the eight secondary-intercardinal directions (NNE; ENE; ESE; SSE; SSW; WSW; WNW; NNW).

  Prepared morning and afternoon peak-hour intersection-capacity analyses for the following conditions at the study intersections: 2022 existing, 2025 future no-build, and 2025 future build.

DESCRIPTION OF EXISTING CONDITIONS

Langan visited the study area to collect the lane-configuration and traffic-control data shown in **Figure 2**. **Appendix D** contains the county's signal-timing data.

Roads

Segment 28 (Alton Road)
According to the Miami Beach Master Plan, Segment 28 is SR 907/Alton Road spanning between Dade Boulevard and 41st Street (1.521 miles). This is a four-lane, north-south, state-maintained minor arterial with a 35 MPH posted speed limit.

Segment 29 (Alton Road)
According to the Miami Beach Master Plan, Segment 29 is SR 907/Alton Road spanning between 41st Street and 63rd Street (2.504 miles). This is a four-lane, north-south, state-maintained minor arterial with a 35 MPH posted speed limit.

Segment 49 (47th Street)
According to the Miami Beach Master Plan, Segment 49 is 47th Street spanning between Alton Road and Pine Tree Drive (0.608 miles). 47th Street is a two-lane, east-west, undivided, city-maintained major collector roadway with a 25 MPH posted speed limit.

43rd Street
43rd Street is a four-lane, east-west, divided, city-maintained minor arterial roadway with a 30 MPH posted speed limit east of Alton Road. West of Alton Road, the street becomes Ed Sullivan Drive and enters into the Mount Sinai Medical Campus.

Segment 20 (SR 112/Julia Tuttle Causeway)
According to the Miami Beach Master Plan, Segment 20 is SR 112/Julia Tuttle Causeway spanning between the City Limits and Alton Road (3.136 miles). SR 112/Julia Tuttle Causeway is a six-lane, divided, east-west, state-maintained principal arterial interstate with a 55 MPH.

Segment 21 (SR 112/41st Street)
According to the Miami Beach Master Plan, Segment 21 is SR 112/41st Street spanning between Alton Road and Collins Avenue (0.815 miles). SR 112/41st Street is a four-lane, undivided, east-west, state-maintained principal arterial roadway with a 35 MPH posted speed limit.

Chase Avenue

Chase Avenue is a two-lane, undivided, east-west, city maintained local roadway with a 30 MPH posted.

Traffic Volumes

We collected traffic-volume data on Thursday, May 5, 2022 from 7:00 to 9:00 AM and 4:00 to 6:00 PM. We developed peak-hour COVID-adjustment factors (0.90 morning and 0.76 afternoon) by comparing the 2022 traffic data collected along the westbound on-ramp to SR112/I-195 to early 2020 traffic counts collected at the same segment. We applied FDOT's seasonal adjustment factors (1.02) to convert the traffic data into peak-season volumes to provide a conservative analysis because the COVID-adjustment factors calculated were less than one. We compared the data of each intersection and determined that the peak hour occurred between 7:30 and 8:30 AM and between 5:00 and 6:00 PM for the study area. **Figure 3** illustrates the existing weekday morning and afternoon peak-hour traffic volumes. Appendix D contains the traffic data and seasonal-adjustment factors.

Intersection Capacity Analysis (Level of Service)

We conducted 2022 existing-conditions capacity analyses for the study intersections using Synchro software. We found that all study intersections operate within their adopted LOS during the morning and afternoon peak-hour periods. **Table 1** summarizes the results of the existing-conditions analysis. **Appendix E** contains intersection-volume tables; **Appendix F** contains the capacity-analyses worksheets.

Capacity analyses for stop-sign controlled intersections are calculated for certain intersection approaches, not for the entire intersection. The stop-sign controlled approaches of stop-sign controlled intersections often exceed their adopted LOS during peak hours because all vehicles must stop and incur a delay before proceeding through the intersection. Capacity analysis provides an indication of the adequacy of intersection and roadway facilities to serve traffic demand. The evaluation criteria used to analyze the study intersections is based on the *Highway Capacity Manual* published by the Transportation Research Board. The adopted maximum LOS for intersections and roadways is LOS D for county roadways and LOS E for state roadways.

Table 1 - 2022 Existing Intersection Capacity Analysis Summary

Location	Traffic Control	Approach	AM Peak Hour		PM Peak Hour	
			LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Alton Road & 47th Street	Signalized	Overall	A	6.9	A	8.3
Alton Road & 43rd Street	Signalized	Overall	D	37.7	C	22.1
Alton Road & 41st Street	Signalized	Overall	C	29.5	D	36.6
Alton Road & Chase Avenue	Signalized	Overall	B	10.2	B	15.3

PLANNED AND PROGRAMMED ROADWAY IMPROVEMENTS

We reviewed the Transportation Planning Organization's 2022 Transportation Improvement Program (2022 through 2025), the county Long Range Transportation Plan (2045), the Miami Beach Transportation Plan, and the FDOT Five Year Work Program (2022 through 2025) and found three planned roadway improvements in the TIP's program network, and three unfunded projects in the Miami Beach Transportation Master Plan. The proposed improvement project number DT4291931 will reconstruct Alton Road with flexible pavement from 43rd Street to Michigan Avenue. The proposed improvement project number DT4402281 is a transportation-planning project under FDOT that will construct express bus lanes on SR112/I-195 from NW 12th Avenue to Alton Road. The proposed improvement project number MDT229 is a 2045 LRTP project for providing rapid transit service along SR112/I-195 from the Golden Glades Multimodal Transportation Facility to the Miami Beach Convention Center as part of the Miami Dade County SMART Plan. The three unfunded projects from the Miami Beach Transportation Master Plan include the I-195 Express Enhanced Bus (Central), the I-195 Express Enhanced Bus (North), and the Miami Beach LRT Collins Extension. Appendix D includes excerpts from the 2045 LRTP, the Miami Beach Transportation Master Plan, and the plans showing the planned improvements.

FUTURE CONDITIONS

This section of the report covers background traffic growth, site-generated trips, trip distribution, and future traffic volumes. The project should be completed by the end of 2025. We developed 2025 no-build traffic volumes by applying a compounded growth rate to the 2022 volumes. We added site-generated trips to the 2025 no-build traffic volumes to develop 2025 build traffic volumes.

Background Traffic

We conducted intersection capacity analyses and found that all four study-intersections are expected to operate within their adopted LOS during the morning and afternoon peak hours. We used a 1.37 percent annual growth-rate factor to develop future background volumes based on FDOT historical traffic volumes. The growth-rate factor accounts for increased background traffic volumes and was applied to the existing volumes to develop 2025 no-build traffic volumes. **Figure 4** illustrates the 2025 no-build traffic volumes. **Table 2** summarizes the results of the 2025 no-build conditions capacity analysis. Appendix F contains the capacity-analyses worksheets.

Table 2 - 2025 No Build Intersection Capacity Analysis Summary

Location	Traffic Control	Approach	AM Peak Hour		PM Peak Hour	
			LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Alton Road & 47th Street	Signalized	Overall	A	7.2	A	8.6
Alton Road & 43rd Street	Signalized	Overall	D	40.1	C	22.8
Alton Road & 41st Street	Signalized	Overall	C	30.8	D	39.2
Alton Road & Chase Avenue	Signalized	Overall	B	10.6	B	16.5

Site-Generated Trips

The proposed development is expected to generate 2,038 daily, 156 morning peak-hour, and 163 afternoon net-new peak-hour trips. We prepared daily, morning peak-hour and afternoon peak-hour trip estimates for the proposed development using equations from the 11th Edition of the ITE *Trip Generation Manual*. We applied a 12.6% multimodal reduction factor based on census data. We did not take into account the construction of the exclusive bus lanes being constructed along I-195, which will provide a faster access to the site, to provide a conservative analysis. **Table 3** summarizes the trip-generation estimates for the proposed development. **Appendix G** contains the trip-generation data.

The existing school on site (Mater Academy) will be demolished as part of the proposed development. To provide a conservative analysis we did not take into account that the proposed school will no longer be on site.

Table 3 - Trip Generation Estimates

Use	Size	Daily	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Hospital	216,558 SF	2,038	104	52	156	57	106	163

Trip Distribution

We determined the directional distribution of site-generated trips based on the cardinal distribution data for TAZ 629 from the Miami-Dade County 2045 Transportation Model (see Appendix D) and from the development's access to the surrounding roadway network. We interpolated the 2015 and 2045 directional-distribution values from the model data to develop percentages for 2025. **Table 4** shows the proposed development's trip distributions. **Figure 5** shows the proposed development's traffic distributions to the study intersections. **Figure 6** illustrates the morning and afternoon development-traffic assignments at the study intersections.

Table 4 - Cardinal Distribution

Year	NNE	ENE	ESE	SSE	SSW	WSW	WNW	NNW
2015	10.50%	4.20%	2.60%	12.60%	13.00%	28.30%	12.70%	16.00%
2045	9.90%	3.60%	2.20%	9.90%	10.60%	35.40%	13.90%	14.60%
2025	**10.30%**	**4.00%**	**2.47%**	**11.70%**	**12.20%**	**30.67%**	**13.10%**	**15.53%**

Build Traffic Volumes

We conducted intersection capacity analyses for the study intersections and found that all four study-intersections are expected to operate within their adopted LOS during the morning and afternoon peak hours. We optimized the signal timing, without changing the cycle length, of Alton Road and 43rd Street during the morning and afternoon peak hour periods, and Alton Road and 41st Street during the afternoon peak hour period to mitigate the delay for the movements and approaches impacted by the proposed development. The 2025 build traffic volumes were derived by adding the total site-generated trips to the 2025 no-build traffic volumes. **Figure 7** illustrates the 2025 build morning and afternoon peak-hour traffic volumes. **Table 5** summarizes the 2025 build LOS for the morning and afternoon peak hours.

Table 5 - 2025 Build Intersection Capacity Analysis Summary

Location	Traffic Control	Approach	AM Peak Hour		PM Peak Hour	
			LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Alton Road & 47th Street	Signalized	Overall	A	7.3	A	8.7
Alton Road & 43rd Street	Signalized	Overall	D	46.4	C	25.8
		Overall[1]	D	51.5	C	25.8
Alton Road & 41st Street	Signalized	Overall	C	30.8	D	39.6
		Overall[1]	-	-	D	42.1
Alton Road & Chase Avenue	Signalized	Overall	B	10.7	B	16.6

[1] Optimized signal timing without changing cycle length

Driveway Volumes and Turn Lane Analysis

The development is located in the far southwest corner of the Mount Sinai Medical Center Campus, which is approximately 0.4 miles to the nearest public roadway. The only access into the site is through 43rd Street and Alton Road, which operates at LOS D or better during the morning and afternoon peak hours. Additionally, 43rd Street and Alton Road currently provides an exclusive southbound right turn lane, and two exclusive northbound left turn lanes, which serve as the pathways into the site. As this intersection already provides the necessary turn lanes to access the site, no further turn lane analysis was studied.

Once within the campus, drivers will travel along Ed Sullivan Drive to access parking lots and a roundabout drop-off, which provide direct access to the new cancer center. To exit the site, drivers traveling north, east and south will use Ed Sullivan Drive to access 43rd Street and Alton Road. Drivers traveling west will use the south internal road, which leads to an exclusive on-ramp with direct access to SR112/I-195 westbound.

Figure 8 shows the project site generated trips along the internal roadways; Appendix F contains the capacity analysis worksheets.

Intersection Queueing Analysis

We prepared a queuing analysis at the on/off-ramp to SR 112/I-195 and at the northbound approaches of Alton Rd at 43rd and 41st streets and determined that the existing queues and expected queues along the ramps will not exceed their storage capacity. The existing northbound queues at the signalized intersections along Alton Road are exceeding capacity and cannot be extended due to physical constrains. The proposed optimization at these signalized intersections are expected to mitigate the existing and expected queues. We collected minutely queuing data between 6:00 AM – 10:00 AM and from 3:00 – 7:00 PM along the ramps, and collected beginning of green and end of yellow queuing data for each northbound phase at the two intersections that occurred between 6:00 AM – 10:00 AM and from 3:00 – 7:00 PM on Thursday, May 5, 2022.

I-195 on/off ramps

We aggregated the minute queueing data into 15-minute queueing data to produce a worst-case scenario of queueing. Based on our findings, over a 15-minute period, the westbound on-ramp experienced a maximum queue of 11 vehicles between 4:00 and 5:30 PM; and the eastbound off-ramp has a maximum queue of 10 vehicles from 8:15 – 8:30 AM. The westbound on-ramp has over 1700 feet of queueing capacity (approximately 77 vehicles) before it merges onto I-195, and the eastbound off-ramp has over 1800 feet of queueing capacity (approximately 82 vehicles) before it merges onto Alton Road. As such, no significant queueing was observed under existing conditions. Currently there are approximately between 1,000 and 1,300 vehicles per hour using these ramps within the study area peak-hours. We anticipate 46 and 25 project-generated trips during the morning and afternoon peak hours, respectively, to utilize the eastbound off-ramp to access the site. As this occurs over an hour period, we do not expect the additional project generated traffic to cause significant queuing along the off-ramp. Similarly, we anticipate 23 and 47 project-generated trips during the morning and afternoon peak hours, respectively, to utilize the exclusive westbound-on ramp that derives from the Mount Sinai Medical Center. Occurring over an hour period, we do not expect these trips to cause any significant queuing along the on-ramp. In addition, based on the expected traffic, the proposed development will add less than 4% of traffic compared to existing conditions. **Table 6** provides a summary of the 15-minute queuing data observed on the ramps. **Appendix H** provides the queueing data and 24-hour counts.

Table 6 - Ramp Queueing Summary

AM Peak Hour	Westbound Queue	Eastbound Queue	PM Peak Hour	Westbound Queue	Eastbound Queue
7:00 AM	0	0	4:00 PM	4	0
7:15 AM	0	0	4:15 PM	**11**	0
7:30 AM	0	0	4:30 PM	2	0
7:45 AM	0	0	4:45 PM	7	0
8:00 AM	0	0	5:00 PM	0	0
8:15 AM	0	4	5:15 PM	9	0
8:30 AM	0	**10**	5:30 PM	**11**	0
8:45 AM	0	9	5:45 PM	3	0
9:00 AM	0	0	6:00 PM	8	0

Alton Road & W. 43rd Street

The northbound approach of Alton Road and W. 43rd Street has two exclusive left turn lanes (an inner lane and an outer lane), and has two through lanes (an inner lane and an outer lane). During each cycle, the number of vehicles queued at the beginning of the green was recorded, and then again at the end of yellow. This established what number of vehicles are waiting in the queue when the light turns green, and what number of vehicles did not process through the signal's green cycle, and will have to wait until the next. Under existing conditions, the inner northbound left turn lane has a storage capacity of 300 linear-feet (14 vehicles). Based on the collected data, the inner-lane experienced a maximum queue of 13 vehicles, which occurred between 8-9 AM. The outer northbound left turn lane has a storage capacity of 400 linear-feet (18 vehicles) and experienced a maximum of queue of 19 vehicles between 7-8 AM. We should note that between 6:45-6:50 AM the outer northbound left-turn experienced a queue of 21 vehicles, which caused vehicles to block the through movements for vehicles traveling from the eastbound off-ramp, but was cleared in less than 5 minutes. The maximum queue within the peak-hour occurred between 7-8 AM with 19 vehicles. The data shows that 95% of the time all left-turn vehicles are processed at the intersection and that the vehicles that were not processed were cleared within the following cycle within the 8-hour study period. We anticipate 71 morning and 39 afternoon peak-hour project-generated northbound left turn trips at the approach, which can utilize both of the northbound left turn lanes. It should be noted that the existing Mater Academy Mount Sinai Academic facility will be removed to support the construction of the proposed surface parking lot of the proposed Cancer Cent. In order to provide a conservative analysis, the traffic analysis does not take into account the removal of the school the build traffic volumes conservatively over-estimates the expected traffic volume into the site.

Based on the build conditions with the proposed signal timing optimization, the northbound left-turn is expected to have a maximum queue of 520 linear feet (approximately 21 vehicles) and can be accommodated within the two existing turn lanes. In addition, we analyzed the northbound left-turn lanes using SIM Traffic, and determined that the expected queue length in both lanes during the optimized morning peak hour is 339 linear feet. Given the total length of both lanes, the total expected queues should be accommodated. The northbound left-turn lane cannot be extended because of its proximity to the I-195 Alton Road off-ramp. This is not a feasible mitigation measure because the extension of the northbound left turn lanes would lead to unsafe weaving between the northbound left turn lane and the Alton Road northbound through lanes. If the northbound left turn lanes were extended, the northbound left-turn lane would start before the northbound through lane would have the opportunity to merge left. Even though the northbound left-turn is expected to exceed capacity on occasion, it is expected that the left-turn lanes can be cleared within one cycle 95% of the time with an average delay of 70.4 seconds.

Under existing conditions, the northbound through lanes experienced a maximum queue of 16 vehicles during the morning and afternoon peak-hours and are all processed within one cycle. The proposed development will not impact the through lanes at the subject intersection and based on the intersection capacity analysis the northbound queue is expected to increase by one vehicle. **Table 7** provides a brief summary of the findings during the peak-hour periods. Appendix H provides the queueing data and Appendix F contains the synchro queueing report.

Table 7 – W. 43rd Street and Alton Road Queuing Summary

Lane Usage	Storage Length	Storage Capacity (vehicles)	2022 Max Queue Recorded during Peak Hour	2025 Build Max Queue during Peak Hour*	Queue Greater Than Storage
NBLL Inside	300	14	13	13	NO
NBLL Outside	400	18	19	15	NO

**Results based on proposed optimization.*

Alton Road & W. 41st Street

The northbound approach of Alton Road and W. 41st Street has one northbound shared through and left turn lane, and one northbound shared through and right turn lane. Because these lanes are shared lanes, they do not have a storage capacity. During each cycle, the number of vehicles queued at the beginning of the green was recorded, and then again at the end of yellow. Under existing conditions, the shared through and left turn lane has a maximum queue of 24 vehicles and the northbound shared through and right turn lane has a maximum queue of 12 vehicles, which occurred between 5-6 PM. The data shows that during the peak-hour more than 50% of the northbound left-turns and more than 70% of the through and right-turns are being cleared during each cycle. The existing intersection capacity analysis shows that the northbound outer

lane is experiencing a delay of 126 seconds. It should be noted that the proposed development will not be impacting this approach, because patrons accessing the site from the south can go through the I-195 westbound on ramp and avoid the traffic signal at Alton Road and 41st Street. With the proposed signal timing optimization at this intersection, the expected delay and queues of the northbound approach will be reduced approximately by 50%. **Table 8** provides a brief summary of the findings during the peak-hour periods. Appendix H provides the queueing data and Appendix F contains the synchro queueing report.

Table 8 – W. 41st Street and Alton Road Queuing Summary

Lane Usage	2022 Max Queue Recorded during Peak Hour	2025 Build Max Queue during Peak Hour*
NBLTL	24	12
NBTL	12	9

**Results based on proposed optimization.*

GATE QUEUEING ANALYSIS

We prepared a queuing analysis for the proposed gate-controlled entrance for the development and found that they will not cause entering traffic to spillback onto the adjacent internal roadways. The internal roadway will lead approximately 0.4 miles within the medical campus to the two gate-controlled entrances to the surface parking lots.

We used the queuing-analysis methodology from *Transportation and Land Development* published by the ITE. This methodology requires hourly rates of vehicle arrival and service times for the gate-controlled driveway to determine vehicle-queue lengths. The queues resulting from this analysis are 95th percentile queues, which are those expected to be generated 95 percent of the time. The vehicle arrival rate was based on the project's peak-hour trip generation, summarized in Table 3.

The gate operation will use gate arms that operate vertically and will be controlled through an auto-spit ticket card. All patrons entering the surface parking lot will receive a ticket to access. We applied the auto-spit ticket-machine service time for all patrons accessing the garage. The service-time data is included in **Appendix I** and shows that the average service time was based on the ITE standard service time of 0.13 minutes for each vehicle entering and the queuing analysis calculations. We assumed 50% of the traffic would use the north entrance point, and 50% of the traffic would use the south entrance point. Vehicle lengths of 25 feet were used to convert the number of vehicles to linear feet. **Table 9** summarizes the results of the gate queuing

analysis and indicates that queues for the proposed gated entrance are not expected to exceed one vehicle and will not exceed vehicle-storage capacity. Appendix I also contains the spec sheet of the proposed gates.

Table 9 - Gate Queuing Analysis Summary

Entrance	Storage Capacity (feet)	95th Percentile Queue Length		Exceeds Capacity?
		Vehicles	Feet	
North Entrance	50	1	25	**NO**
South Entrance	50	1	25	**NO**

MODES OF TRANSPORTATION

The proposed development is approximately 0.1 mile from the nearest transit stop at the Mount Sinai Hospital & Gumenick Building. The Mount Sinai Medical Center campus is well served by several Miami Dade Bus Routes, as well as the Miami Beach Trolley. The campus provides sidewalk access to the various bus stops, and it is expected that the new cancer center will provide sidewalk and crosswalks to ensure pedestrians can access other parts of the campus, as well as bus stops. There are currently no bike lanes within the internal roadway network of the campus. Therefore, we do not anticipate patrons from the proposed development to bike to access the site. The transit routes that are serving the area are routes 113, 115, 241, MB-MID, 110 and 150. Route 113 provides east-west service between the Civic Center and Mount Sinai Center. Route 115 provides north-south service between 88th Street in Mid Beach and Lincoln Road in South Beach, with stops along Alton Road. Route 224 provides limited east west service between Biscayne Boulevard in Midtown to the Mount Sinai Medical Center. MB-MID is the Mid Beach Trolley Service that provides north-south service from the Mount Sinai Medical Center to South Beach, with stops along Collins Avenue. Route 110 provides east-west service between Miami Springs and Mid Beach with stops along NW 36th Street. Route 150 provides east-west and north-south service between Miami International Airport and South Pointe in South Beach, with stops along 41st Street, and Collins Avenue. Appendix D contains a copy of the transit route maps.

CONCLUSIONS

Langan performed a traffic-impact analysis for the MSMC Cancer Center development expected to be completed by 2025. The analysis shows the following results for the 2025 build conditions:

- All study intersections are expected to operate within their adopted LOS during the morning and afternoon peak-hours with the project's impacts.
- We optimized the signal timing, without changing the cycle length, of Alton Road and 43rd Street during the morning and afternoon peak hour periods, and Alton Road and 41st Street during the afternoon peak hour period to mitigate the delay for the movements and approaches impacted by the proposed development.
- As this project is located approximately 0.4 miles within the Mount Sinai Medical Center Campus, there are no driveway connections to public roadways, and no driveway analysis was required. The main access to public roads is through 43rd Street and Alton Road, which operates at LOS D or better during the morning and afternoon peak hours.
- Queueing along the on-ramp and off-ramp to SR112/I-195 will not exceed 11 vehicles during any 15-minute period.
- Queuing along the northbound approaches of the intersections of Alton Road at 43rd and 41st streets are exceeding capacity in the existing conditions. The proposed signal timing optimization at these intersections will mitigate the expected queues at the northbound approaches of these intersections.
- The proposed development gate-controlled access points will not cause entering traffic to spillback onto the adjacent internal roadways.

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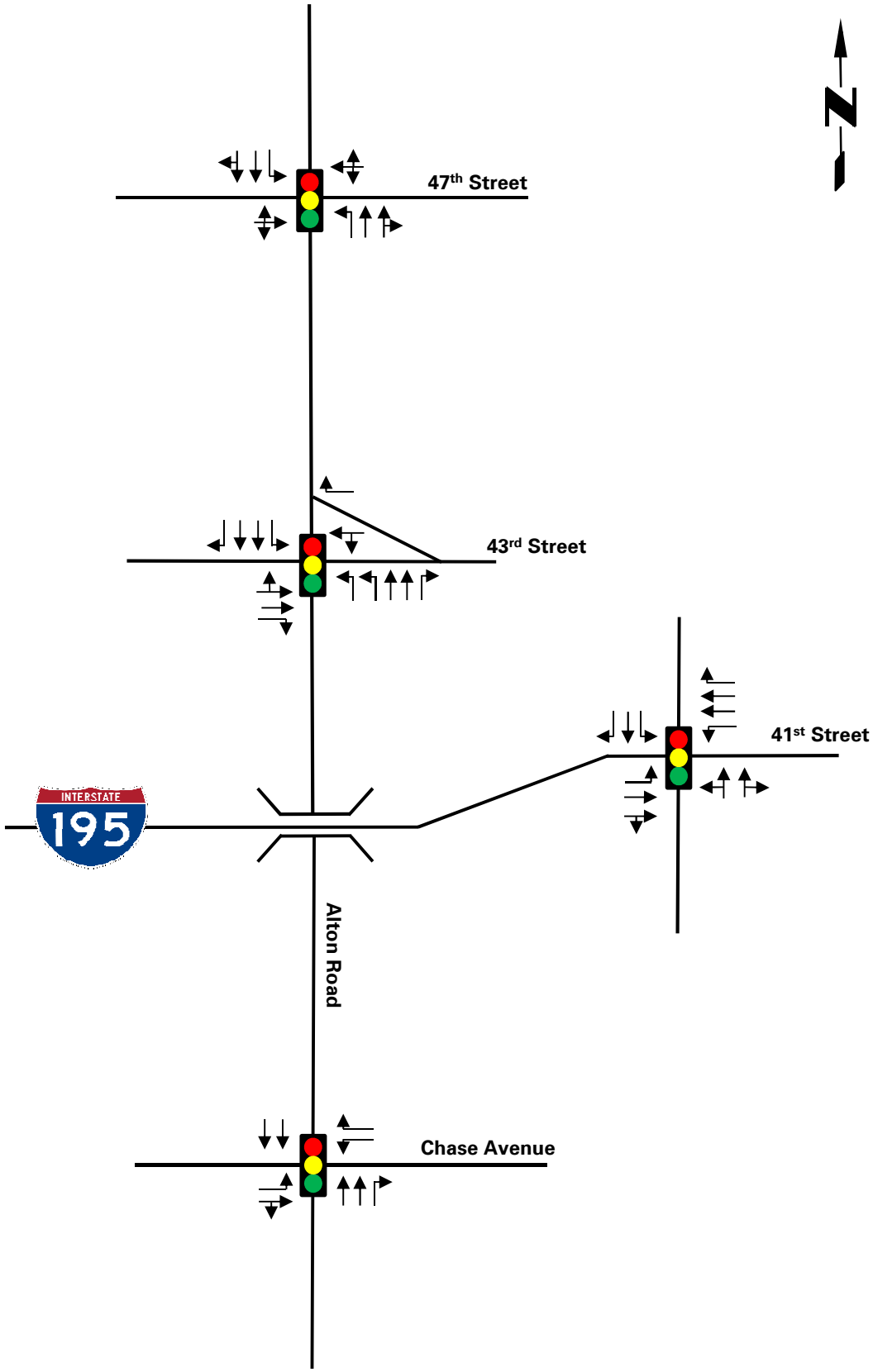
APPENDIX A
FIGURES

LANGAN ENGINEERING & ENVIRONMENTAL SERVICES 15150 NW 79th Court, Suite 200, Miami Lakes, FL 33016 P: 786.264.7221 F: 786.264.7201 www.langan.com FL CERTIFICATE OF AUTHORIZATION No. 00006601	Project MSMC CANCER CENTER MIAMI BEACH MIAMI DADE / FLORIDA	Figure Title SITE LOCATION MAP	Project No. 330089601 Date 6/17/2022 Scale NTS	FIGURE 1



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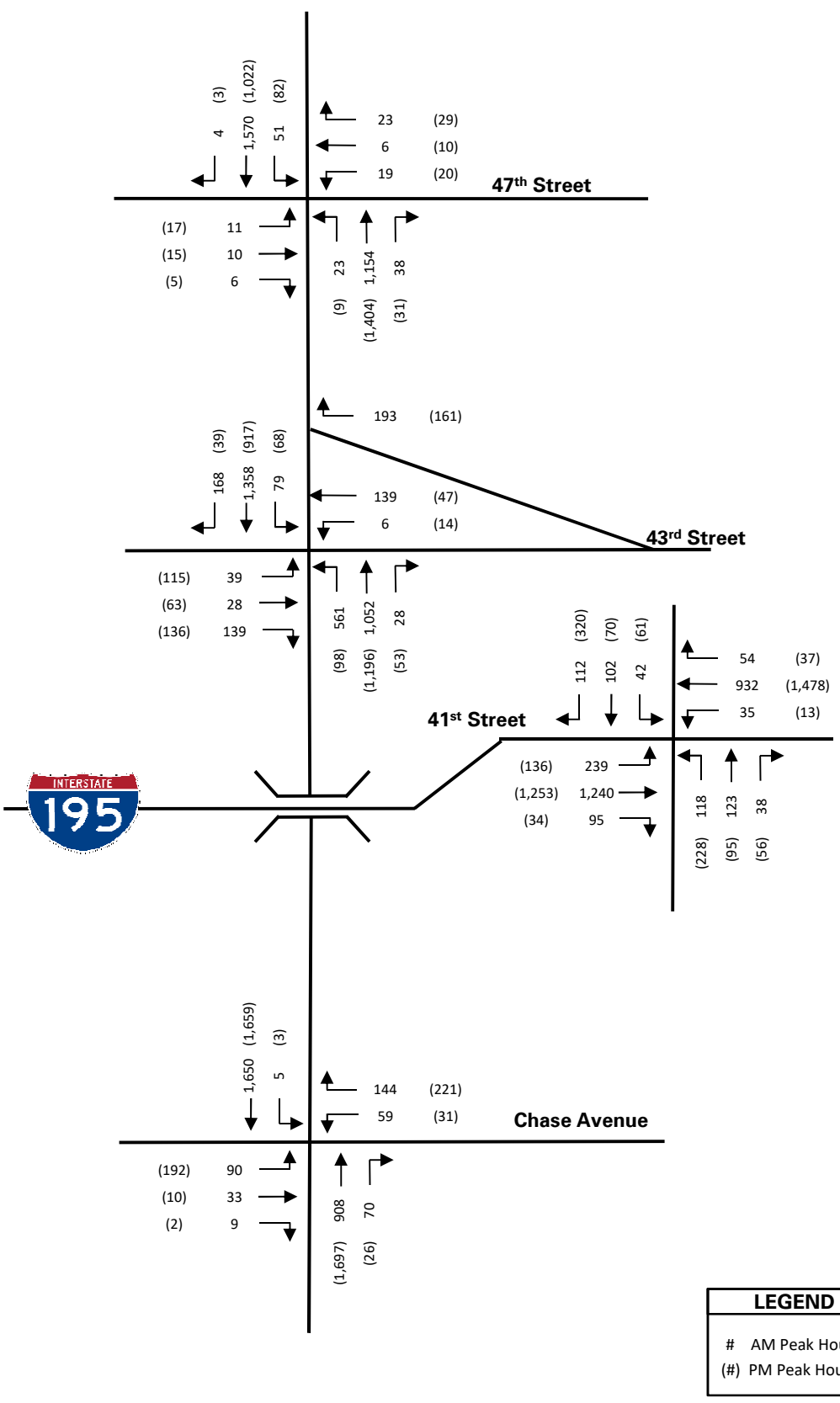
FL CERTIFICATE OF AUTHORIZATION No. 00006601

Project	Figure Title	Project No.	
MSMC CANCER CENTER MIAMI BEACH MIAMI DADE FLORIDA	INTERSECTION LANE CONFIGURATIONS	330089601	FIGURE 2
		Date 6/17/2022	
		Scale NTS	



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FL CERTIFICATE OF AUTHORIZATION No. 00006601

Project
MSMC CANCER CENTER
MIAMI BEACH
MIAMI DADE FLORIDA

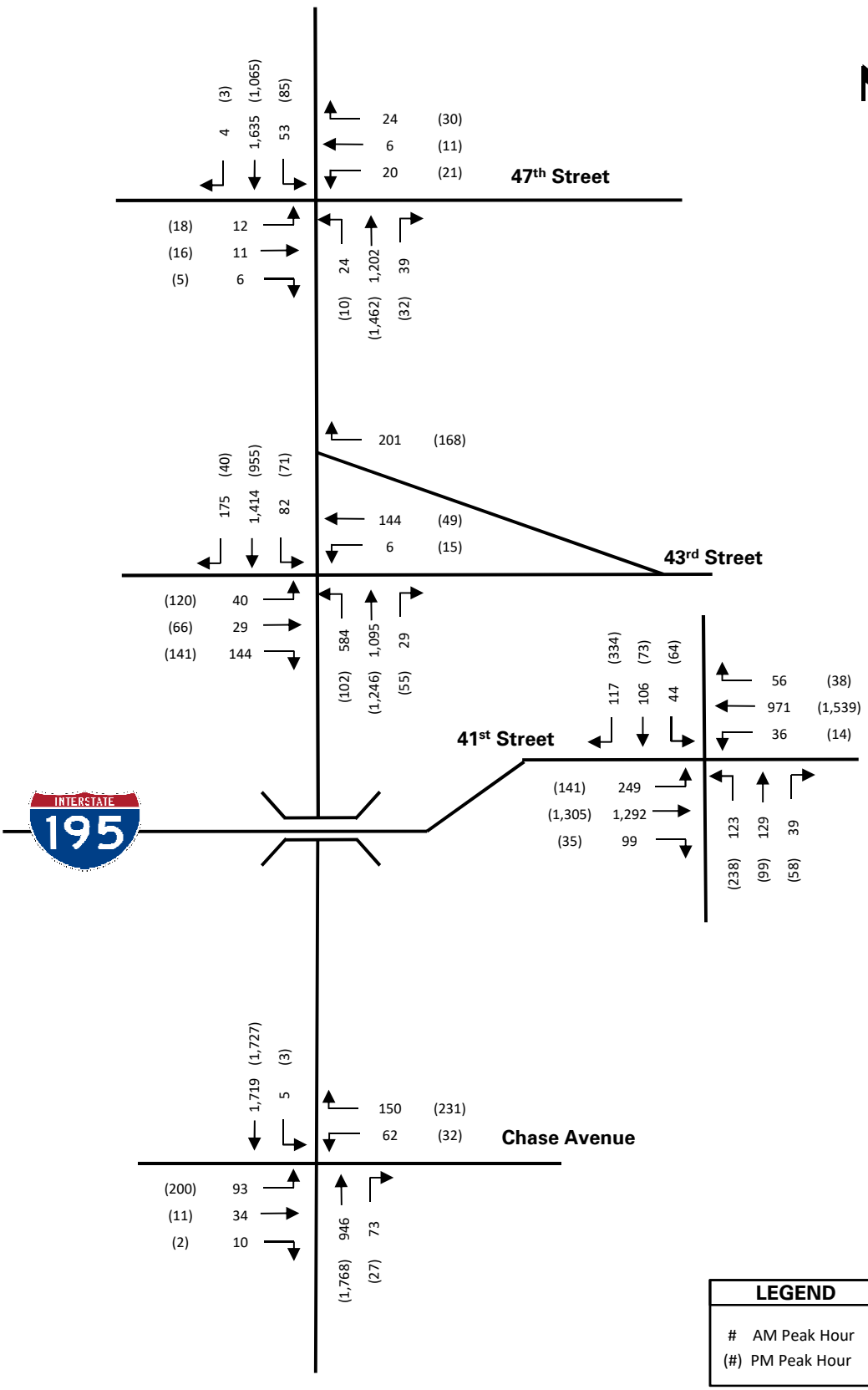
Figure Title
2022 EXISTING TRAFFIC VOLUMES

Project No.
330089601

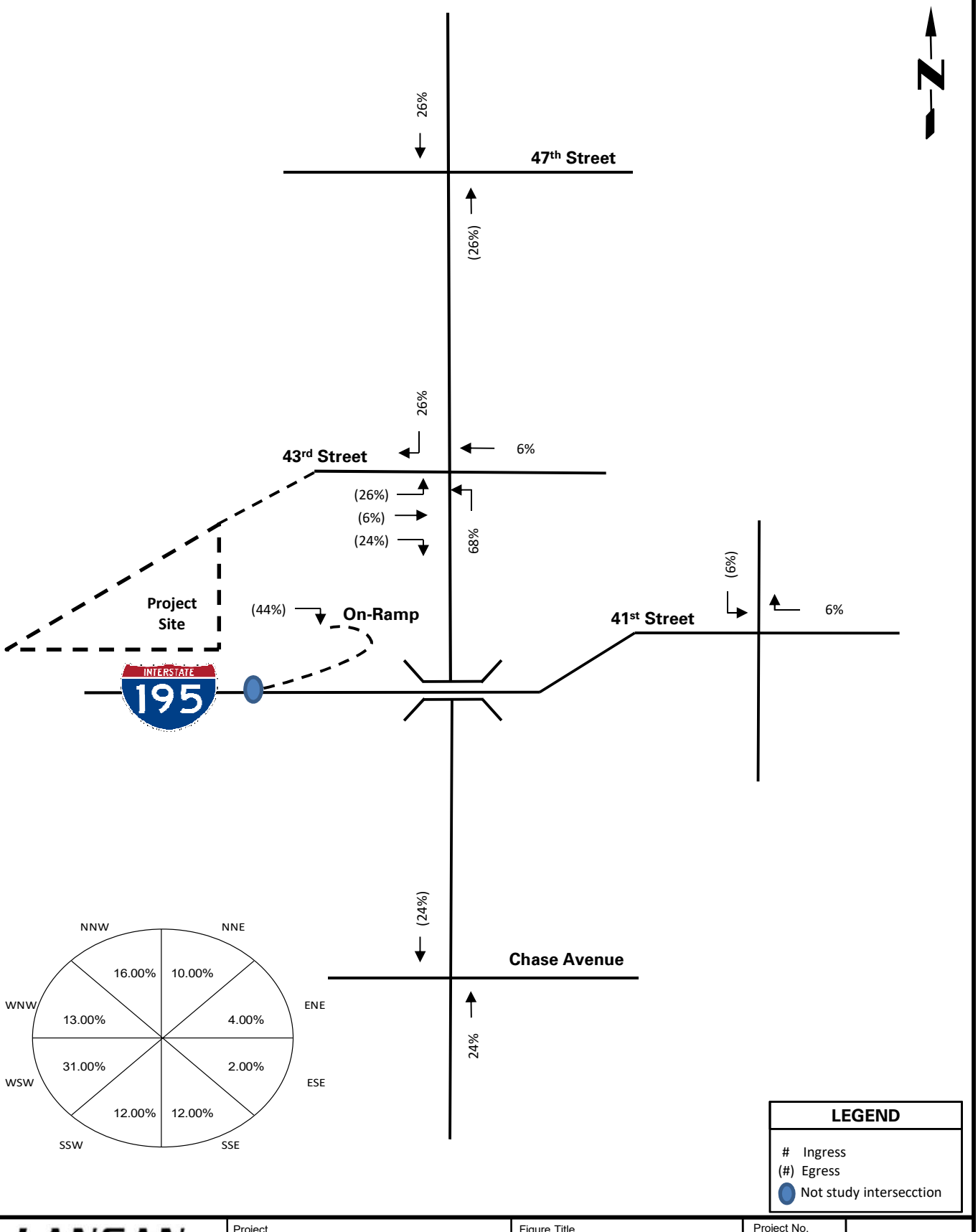
Date
6/17/2022

Scale
NTS

FIGURE 3

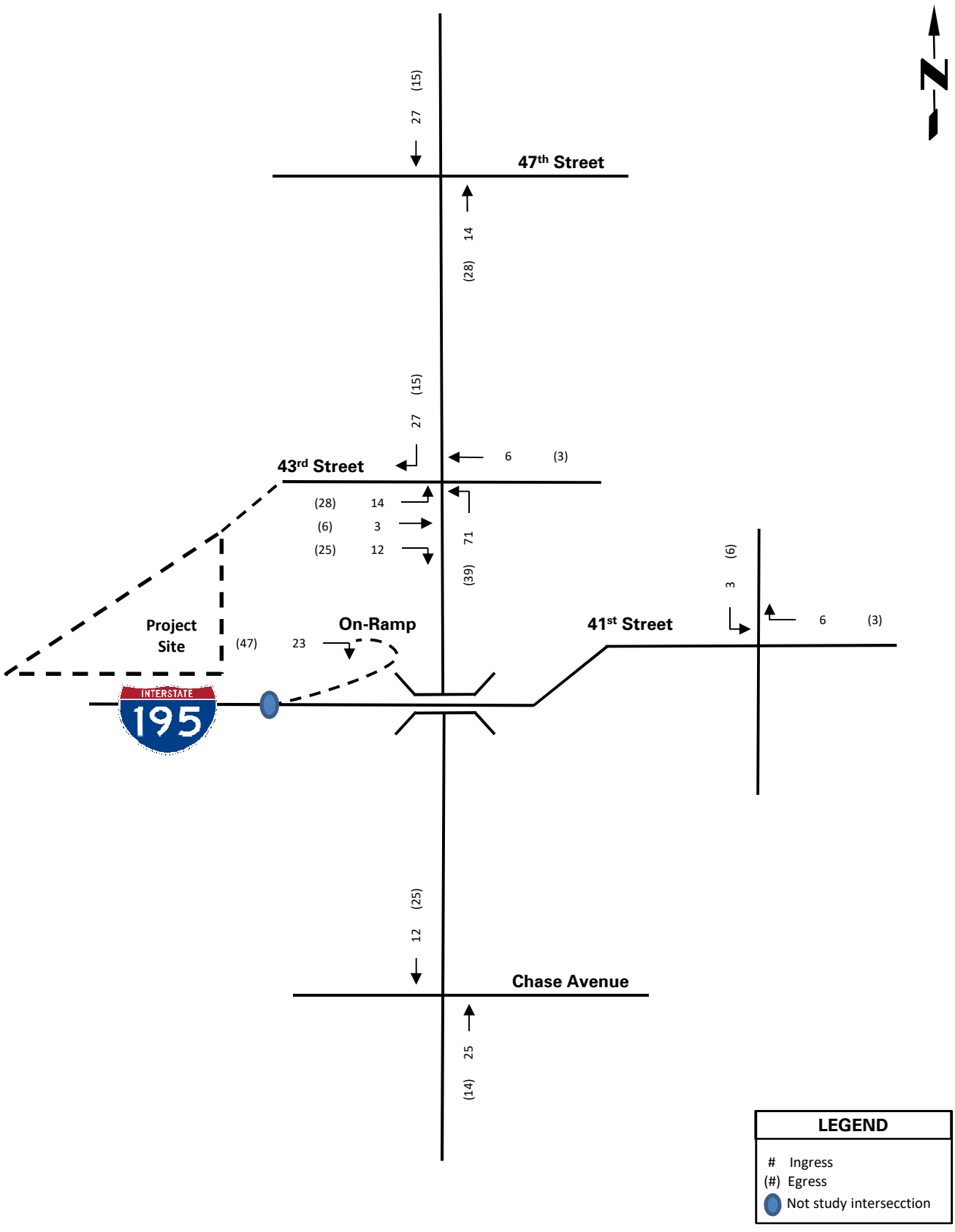


LANGAN ENGINEERING & ENVIRONMENTAL SERVICES 15150 NW 79th Court, Suite 200, Miami Lakes, FL 33016 P: 786.264.7221 F: 786.264.7201 www.langan.com FL CERTIFICATE OF AUTHORIZATION No. 00006601	Project **MSMC CANCER CENTER** MIAMI BEACH MIAMI DADE FLORIDA	Figure Title **2025 NO BUILD TRAFFIC VOLUMES**	Project No. 330089601 Date 6/17/2022 Scale NTS	**FIGURE 4**

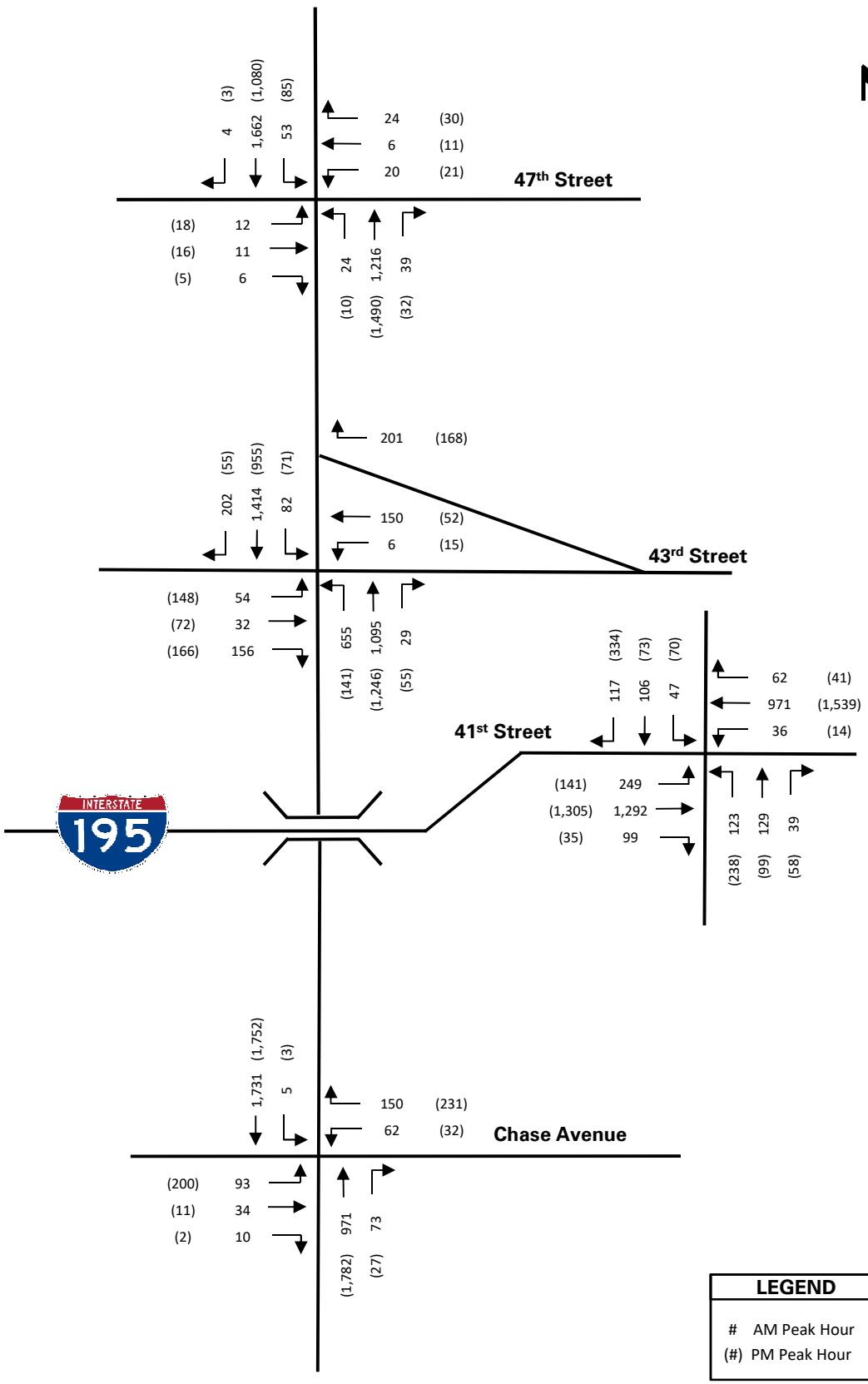


LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES
15150 NW 79th Court, Suite 200, Miami Lakes, FL 33016
P: 786.264.7221 F: 786.264.7201 www.langan.com
FL CERTIFICATE OF AUTHORIZATION No. 00006601

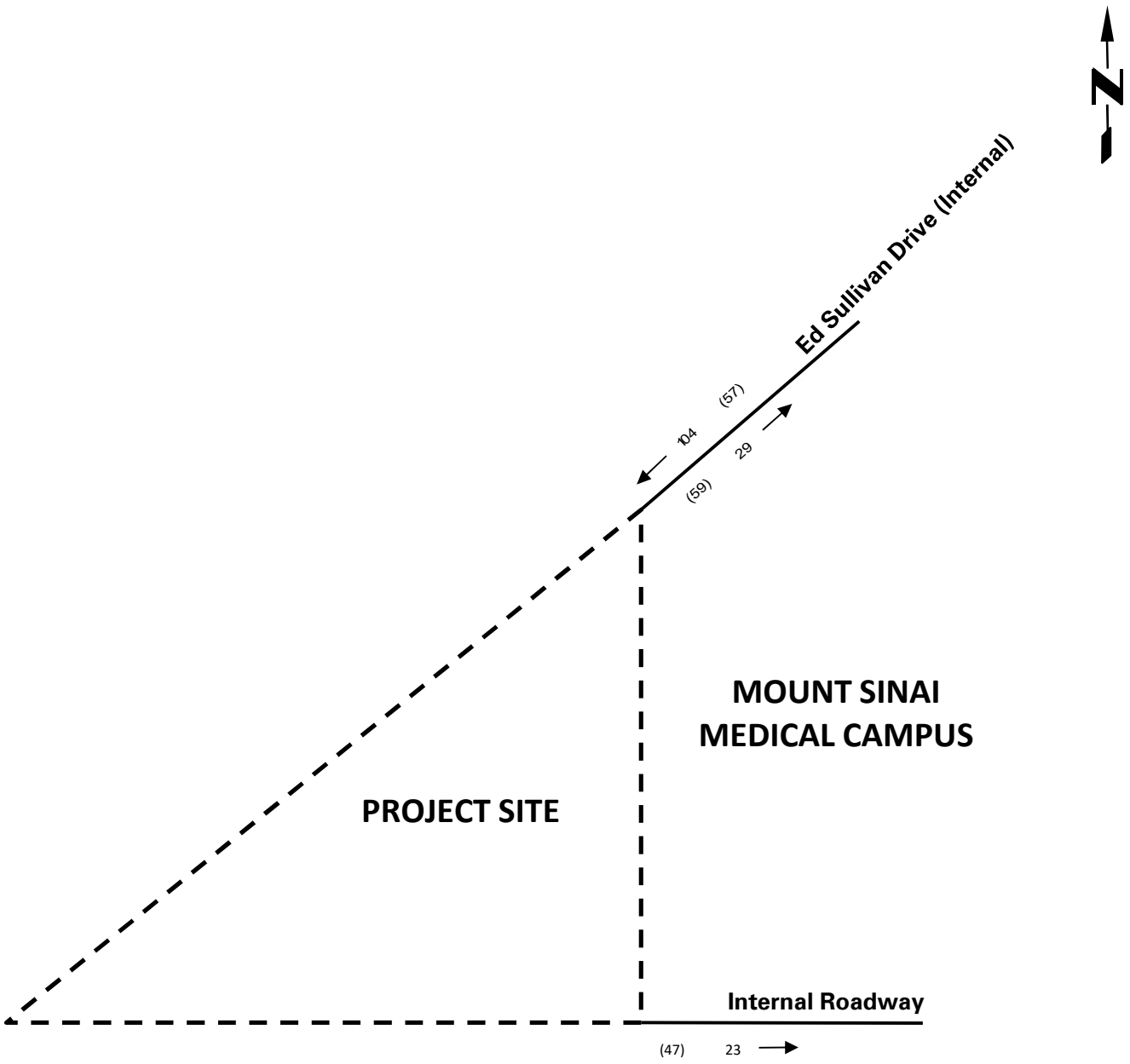
Project	Figure Title	Project No.	
MSMC CANCER CENTER MIAMI BEACH MIAMI DADE FLORIDA	PROJECT TRAFFIC DISTRIBUTION	330089601	FIGURE 5
		Date 6/17/2022	
		Scale NTS	



LANGAN ENGINEERING & ENVIRONMENTAL SERVICES 15150 NW 79th Court, Suite 200, Miami Lakes, FL 33016 P: 786.264.7221 F: 786.264.7201 www.langan.com FL CERTIFICATE OF AUTHORIZATION No. 00006601	Project **MSMC CANCER CENTER** MIAMI BEACH MIAMI DADE FLORIDA	Figure Title **PROJECT TRAFFIC**	Project No. 330089601 Date 6/17/2022 Scale NTS	**FIGURE 6**



LANGAN ENGINEERING & ENVIRONMENTAL SERVICES 15150 NW 79th Court, Suite 200, Miami Lakes, FL 33016 P: 786.264.7221 F: 786.264.7201 www.langan.com FL CERTIFICATE OF AUTHORIZATION No. 00006601	Project MSMC CANCER CENTER MIAMI BEACH MIAMI DADE FLORIDA	Figure Title 2025 BUILD TRAFFIC VOLUMES	Project No. 330089601 Date 6/17/2022 Scale NTS	FIGURE 7



LEGEND
AM Peak Hour
(#) PM Peak Hour
Driveway

LANGAN ENGINEERING & ENVIRONMENTAL SERVICES 15150 NW 79th Court, Suite 200, Miami Lakes, FL 33016 P: 786.264.7221 F: 786.264.7201 www.langan.com FL CERTIFICATE OF AUTHORIZATION No. 00006601	Project **MSMC CANCER CENTER** MIAMI BEACH MIAMI DADE FLORIDA	Figure Title **DRIVEWAY VOLUMES**	Project No. 330089601 Date 6/17/2022 Scale NTS	**FIGURE 8**

APPENDIX B
SITE PLAN

Mount Sinai
MEDICAL CENTER
Braman Cancer Center

CANNONDESIGN
1100 Clark Ave
St. Louis, MO 63102
P: 314.241.6250
F: 314.241.2570
www.cannondesign.com

ARCHITECT CORPORATION
CANNON FLORIDA INC.
AAC000314 8874

CannonDesign
Structural Engineering
50 Fountain Plaza
Suite 200
Buffalo, New York 14202
716.773.6800

TLC Engineering
Mechanical Engineering
Electrical Engineering
Plumbing Engineering
Fire Protection Engineering
Technology Engineering
255 S Orange Ave
Suite 1600
Orlando, Florida 32801
407.841.9050

Langan Engineering
Civil Engineering
Parkside Corporate Center
15150 NW 79th Court
Suite 200
Miami Lakes, Florida 33016-5848
786.264.7200

GSLA Design
17670 NW 78th Ave
Suite 214
Miami, Florida, 33015
305.392.1016

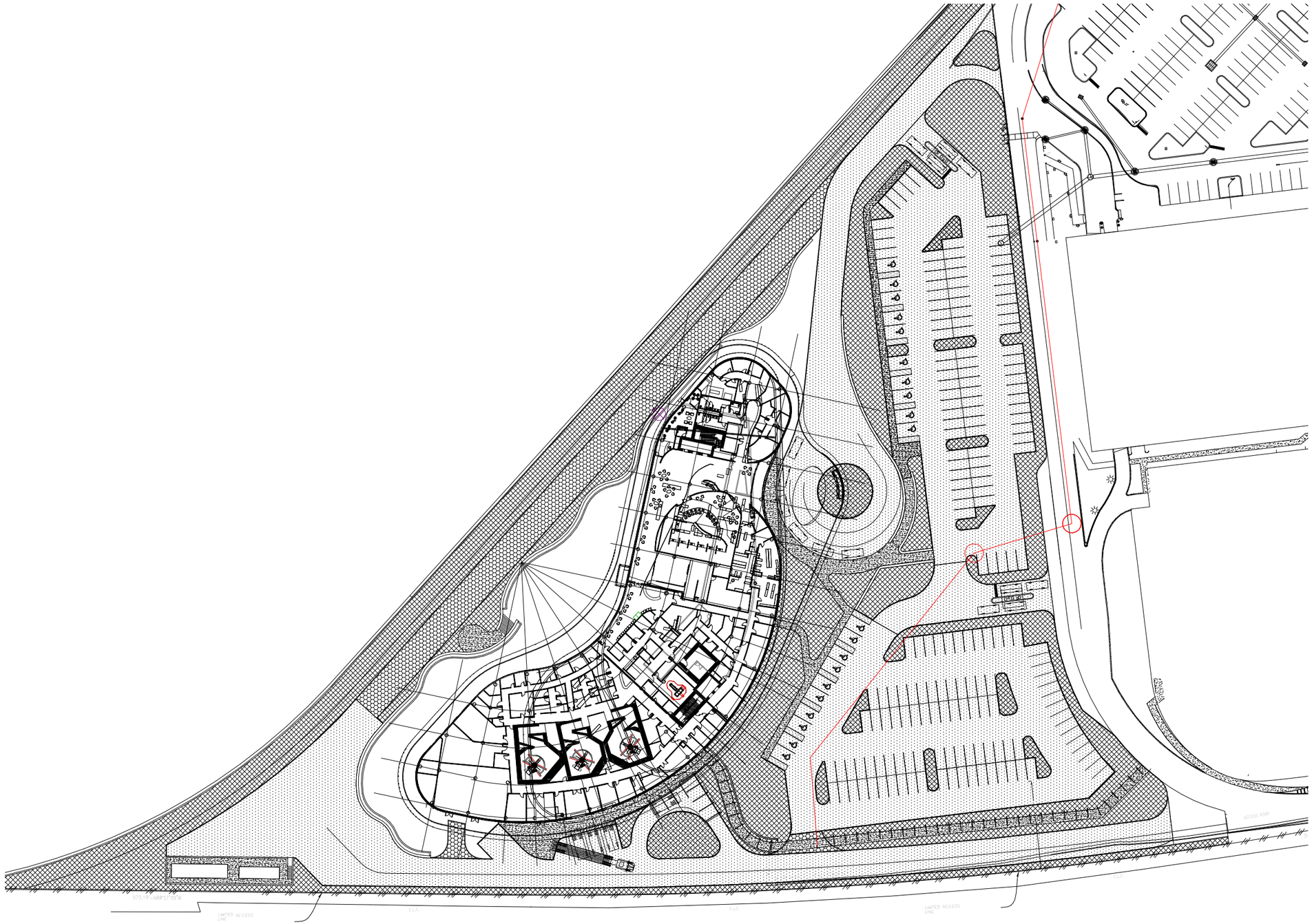
DRB22-0845
1ST SUBMISSION
3 June 2022

Drawing Scale: Not to Scale

SITE LANDSCAPE DIAGHRAM

Project No.: 006607

A012



Braman Cancer Center Site

1 : 1080

Mount Sinai
MEDICAL CENTER
Braman Cancer Center

CANNONDESIGN
ARCHITECT CORPORATION
CANNON FLORIDA INC.
AAC000314 8874

TLC ENGINEERING SOLUTIONS

LANGAN

GS DESIGN

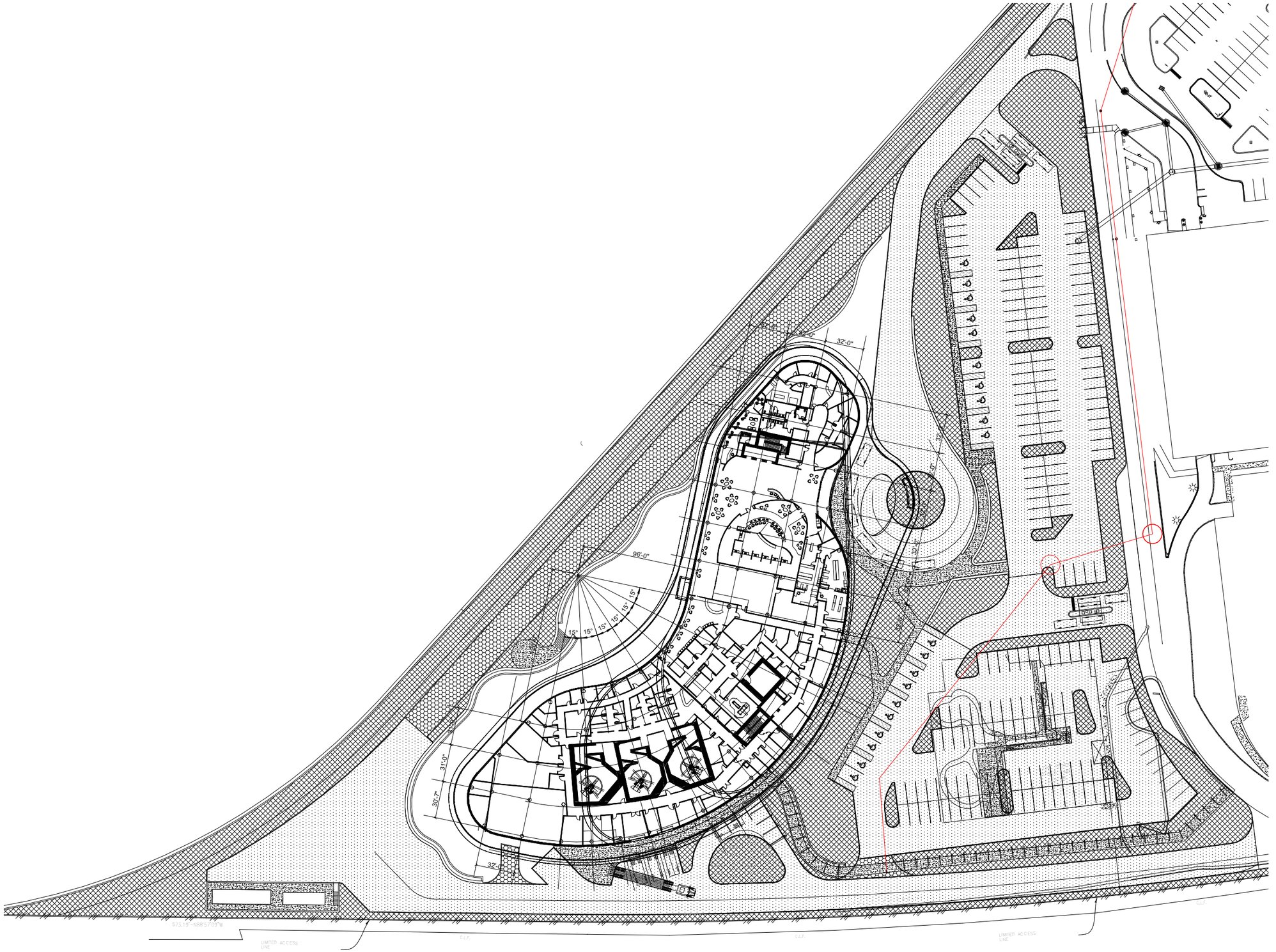
DRB22-0845
First Submission
21 June 2022

ARCHITECT OF RECORD
NUMBER

N

Zoning Conformance

A013



Mount Sinai
MEDICAL CENTER
Braman Cancer Center

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ARCHITECT CORPORATION
CANNON FLORIDA INC.
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LANGAN

GS DESIGN

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First Submission
21 June 2022

ARCHITECT OF RECORD
NUMBER

N

SITE MATERIALS & AREAS

A013A

Braman Cancer Center Site

Mount Sinai
MEDICAL CENTER
Braman Cancer Center

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ARCHITECT CORPORATION
CANNON FLORIDA INC.
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TLC ENGINEERING SOLUTIONS

LANGAN

GSA DESIGN

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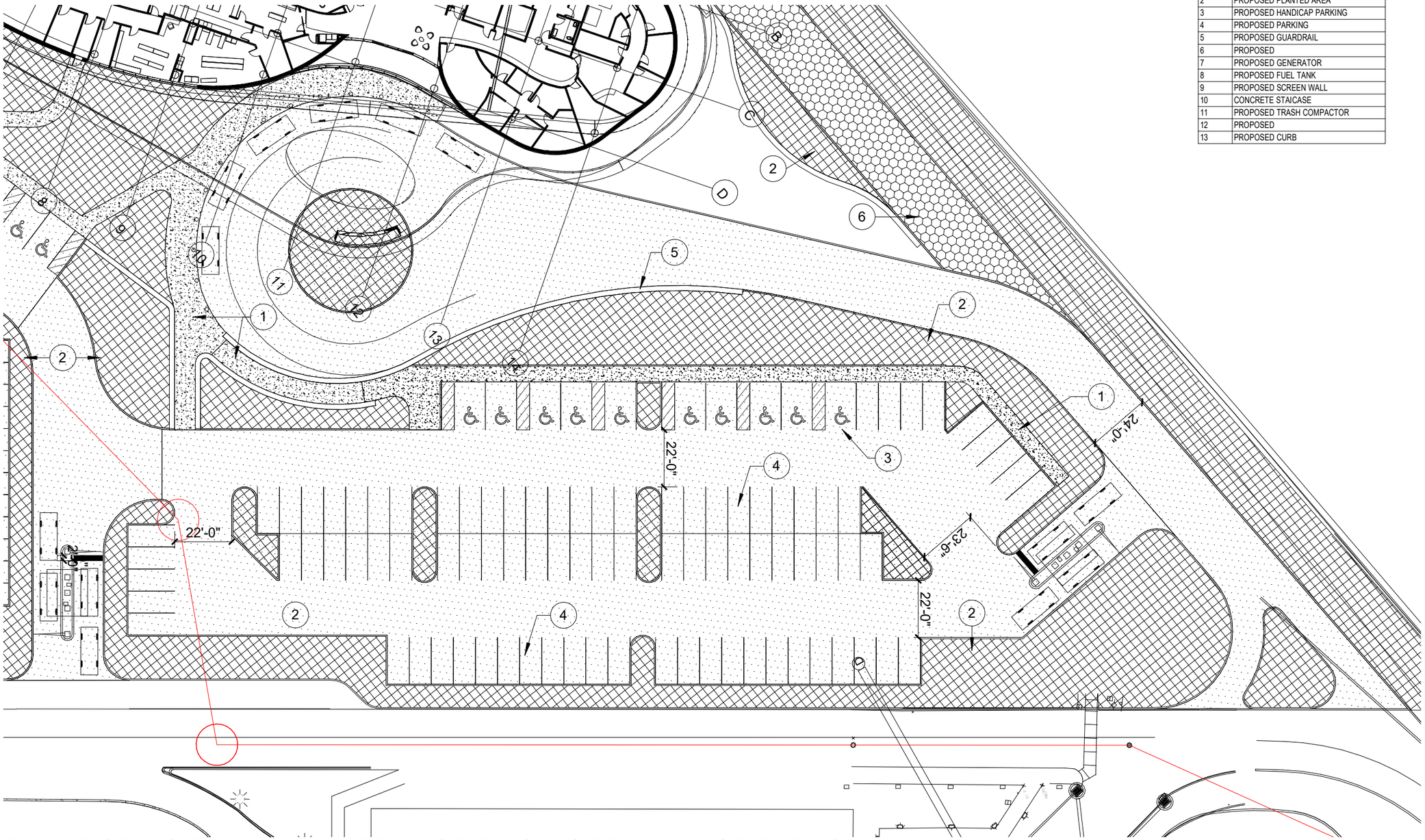
ARCHITECT OF RECORD
NUMBER

N

ENLARGED SITEPLAN KEY

A013B



SITE PLAN - KEY NOTES	
Circle Keynote	Description
1	PROPOSED SIDEWALK
2	PROPOSED PLANTED AREA
3	PROPOSED HANDICAP PARKING
4	PROPOSED PARKING
5	PROPOSED GUARDRAIL
6	PROPOSED
7	PROPOSED GENERATOR
8	PROPOSED FUEL TANK
9	PROPOSED SCREEN WALL
10	CONCRETE STAICASE
11	PROPOSED TRASH COMPACTOR
12	PROPOSED
13	PROPOSED CURB

ENLARGED SITE PLAN- ENTRANCE DROP-OFF AND NORTHEAST PARKING

1" = 40'-0"

Mount Sinai
MEDICAL CENTER
Braman Cancer Center

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LANGAN

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21 June 2022

ARCHITECT OF RECORD NUMBER

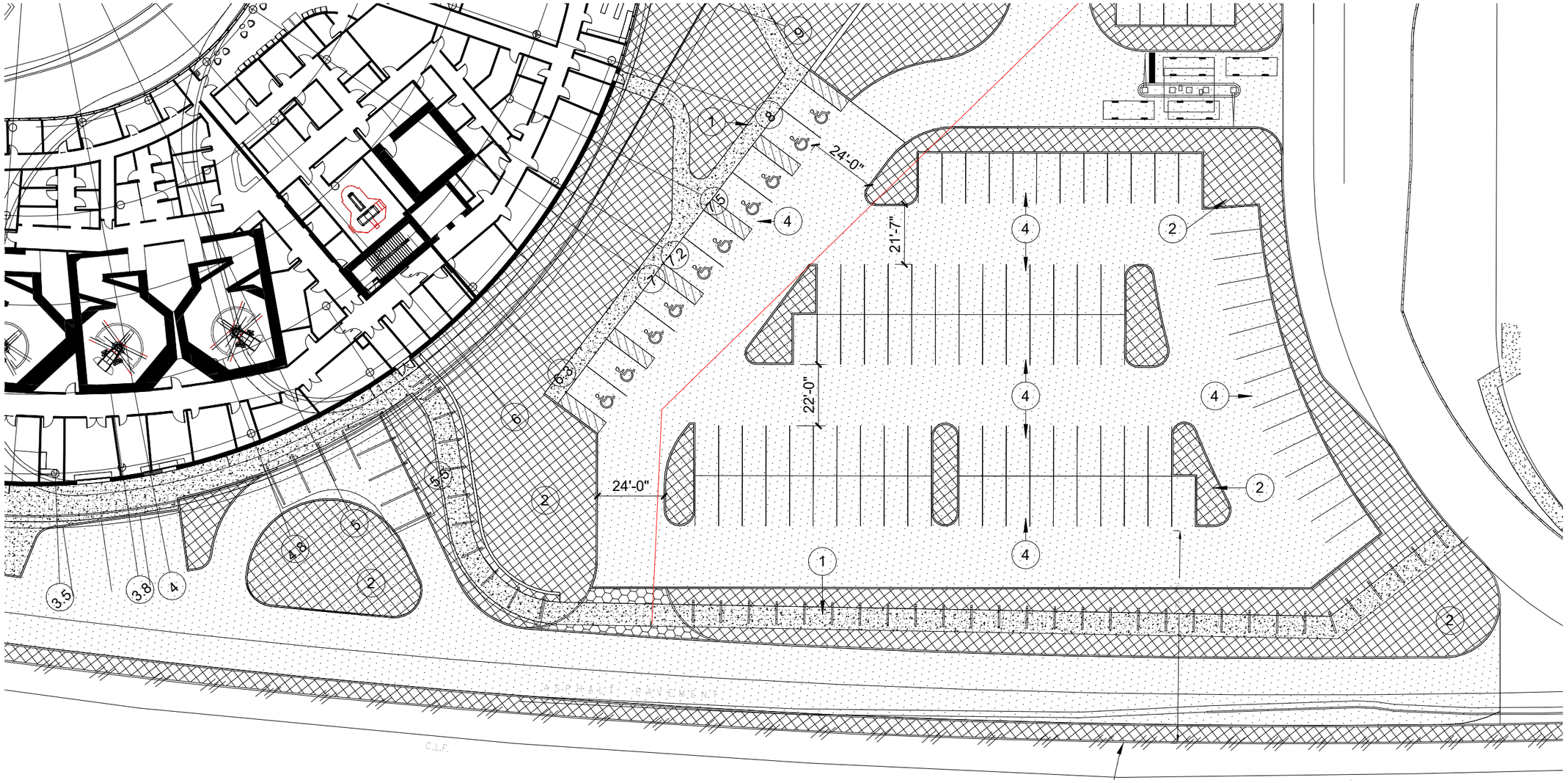
N

ENTRANCE DROP-OFF NORTHEAST SURFACE PARKING

A0150

SITE PLAN - KEY NOTES	
Circle Keynote	Description
1	PROPOSED SIDEWALK
2	PROPOSED PLANTED AREA
3	PROPOSED HANDICAP PARKING
4	PROPOSED PARKING
5	PROPOSED GUARDRAIL
6	PROPOSED
7	PROPOSED GENERATOR

SITE PLAN - KEY NOTES	
Circle Keynote	Description
8	PROPOSED FUEL TANK
9	PROPOSED SCREEN WALL
10	CONCRETE STAICASE
11	PROPOSED TRASH COMPACTOR
12	PROPOSED
13	PROPOSED CURB



SOUTH EAST PARKING LOT AND EMPLOYEE PEDESTRAIN CANOPY

1 — 1" = 40'-0"

Mount Sinai MEDICAL CENTER
Braman Cancer Center

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ARCHITECT CORPORATION
CANNON FLORIDA INC.
AAC000314 8874

TLC ENGINEERING SOLUTIONS
LANGAN
GS DESIGN

DRB22-0845
First Submission
21 June 2022

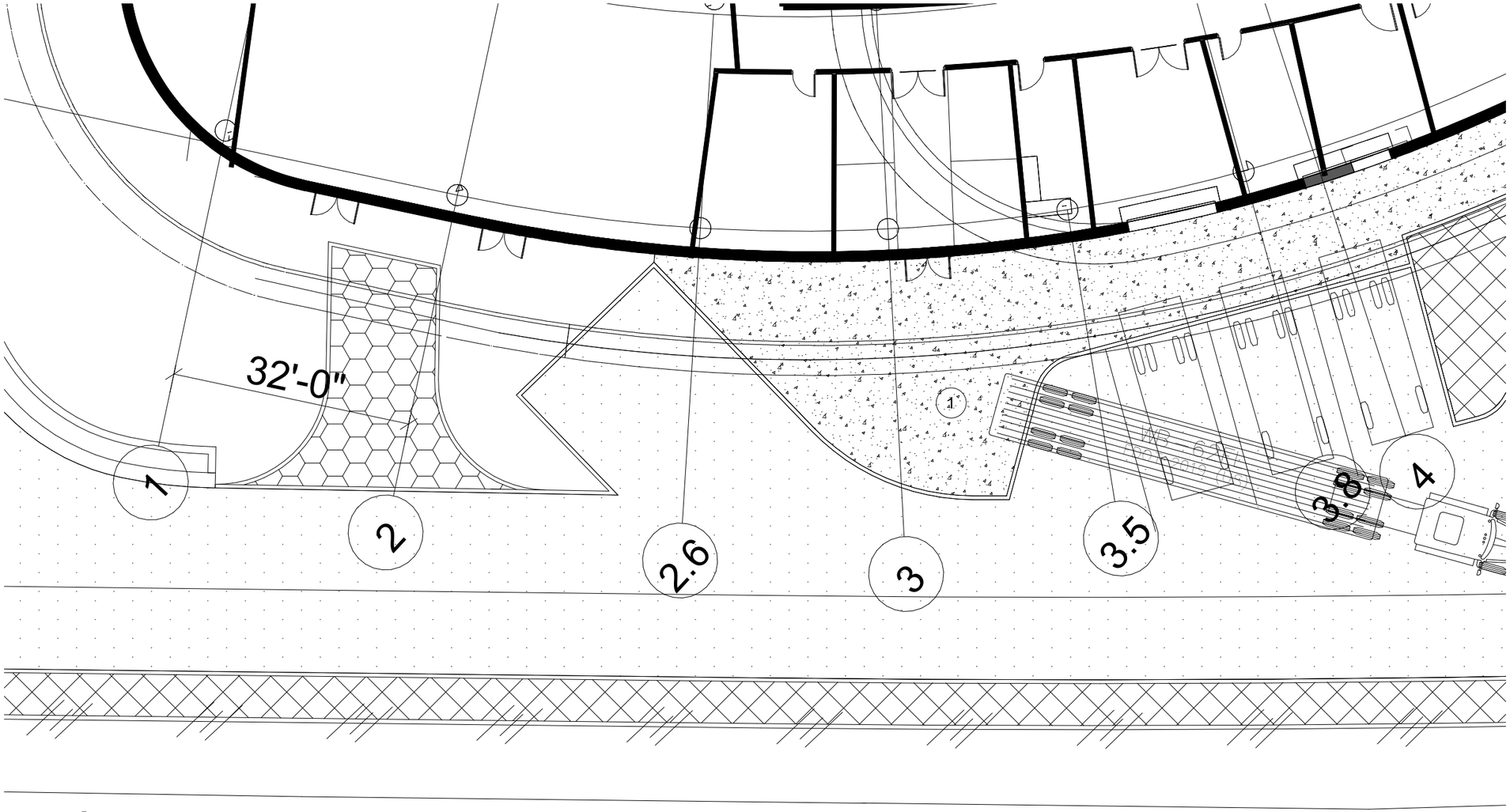
ARCHITECT OF RECORD NUMBER

ENLARGED SITE PLAN SOUTHEAST PARKING

A013D

SITE PLAN - KEY NOTES	
Circle Keynote	Description
1	PROPOSED SIDEWALK
2	PROPOSED PLANTED AREA
3	PROPOSED HANDICAP PARKING
4	PROPOSED PARKING
5	PROPOSED GUARDRAIL
6	PROPOSED
7	PROPOSED GENERATOR

SITE PLAN - KEY NOTES	
Circle Keynote	Description
8	PROPOSED FUEL TANK
9	PROPOSED SCREEN WALL
10	CONCRETE STAICASE
11	PROPOSED TRASH COMPACTOR
12	PROPOSED
13	PROPOSED CURB



ENLARGED SITE PLAN

1/16" = 1'-0"

Mount Sinai
MEDICAL CENTER
Braman Cancer Center

CANNONDESIGN
ARCHITECT CORPORATION
CANNON FLORIDA INC.
AAC000314 8874

TLC ENGINEERING SOLUTIONS

LANGAN

GS DESIGN

DRB22-0845
First Submission
21 June 2022

ARCHITECT OF RECORD
NUMBER

N

ENLARGED SITE PLAN AREAS SERVICE AREA

A013E

Program Summary

Approved Program: 216,558 BGSF

Program - Key Rooms

- **Lobby:** Lobby front desk, Patient Access, Donor Lounge and Conference Center
- **Supportive Services:** Appearance Center, Spa, Meditation/Respite and 2 Integrative Therapy Rooms
- **Retail:** Café
- **Physician Practices:** 65 Exam Rooms (*15 shelled*)
- **Infusion Center:** 56 Infusion Spaces (*17 shelled*) - Including 36 Infusion Bays, 12 Private Rooms, 4 Fast Track, and 4 Cold Cap Spaces
- **Radiation Oncology:** 3 Linear Accelerators (*1 shelled*), 1 HDR, 1 CT Sim and 6 Exam Rooms
- **Imaging:** 2 MRI (*1 shelled*) , 1 CT, 1 PET CT, 2 Ultrasound Machines, 2 General Radiology/X-ray (*1 shelled*) and Nuclear Medicine (*shelled*)
- **Women's/Breast Center:** 5 Mammography with 5 Ultrasound with 2 Procedure rooms.
- **Rehab:** Small Rehab Gym, 2 Lymphedema Rooms and Speech Therapy Consult Room
- **Pharmacies:** Infusion Pharmacy, Retail Pharmacy and Specialty Pharmacy
- **Phlebotomy and Lab:** 10 Stations
- **Clinical Research:** Offices and Workstations for Staff
- **Physician Offices:** 28 Private Offices plus Workstations for Staff

During the programming and Concept Design phases, Mt.Sinai and Cannon Design worked together developing the Key programmatic elements that will be housed within the Cancer Center. The goal is to create a comprehensive center, that would be able to serve not only the current needs of the community but have the ability to grow and adapt for the future. The Key room list details the final growth capacity for each department, and the shelled portion to be built out in the future.

OFFICE OF THE PROPERTY APPRAISER

Summary Report

Generated On : 4/13/2022

Property Information	
Folio:	02-3222-011-0360
Property Address:	4300 ALTON RD Miami Beach, FL 33140-2800
Owner	MOUNT SINAI MEDICAL CTR OF FL INC
Mailing Address	4300 ALTON RD 5TH FL MIAMI BEACH, FL 33140-2800
PA Primary Zone	9600 HOSPITALS
Primary Land Use	8543 HOSPITAL - GOVERNMENTAL : HEALTH CARE
Beds / Baths / Half	0 / 0 / 0
Floors	10
Living Units	0
Actual Area	Sq.Ft
Living Area	Sq.Ft
Adjusted Area	1,803,527 Sq.Ft
Lot Size	2,315,133 Sq.Ft
Year Built	Multiple (See Building Info.)

Assessment Information			
Year	2021	2020	2019
Land Value	$23,151,330	$23,151,330	$23,151,330
Building Value	$143,048,613	$142,552,936	$156,210,754
XF Value	$4,760,738	$4,762,964	$4,751,229
Market Value	$170,960,681	$170,467,230	$184,113,313
Assessed Value	$170,960,681	$170,467,230	$184,113,313

Benefits Information				
Benefit	Type	2021	2020	2019
Hosp and Nurs Homes	Exemption	$153,864,613	$153,420,507	$165,701,982
Note: Not all benefits are applicable to all Taxable Values (i.e. County, School Board, City, Regional).				

Short Legal Description
22-27 53 42
NAUTILUS SUB PB 8-95
LOT 41 & JOHNS & COLLINS ISLAND &
SUBMERGED LAND PER OR 1825-497 &
1825-494 ALL LESS 36 ST CAUSEWAY

Taxable Value Information			
	2021	2020	2019
County			
Exemption Value	$153,864,613	$153,420,507	$165,701,982
Taxable Value	$17,096,068	$17,046,723	$18,411,331
School Board			
Exemption Value	$153,864,613	$153,420,507	$165,701,982
Taxable Value	$17,096,068	$17,046,723	$18,411,331
City			
Exemption Value	$153,864,613	$153,420,507	$165,701,982
Taxable Value	$17,096,068	$17,046,723	$18,411,331
Regional			
Exemption Value	$153,864,613	$153,420,507	$165,701,982
Taxable Value	$17,096,068	$17,046,723	$18,411,331

Sales Information			
Previous Sale	Price	OR Book-Page	Qualification Description
03/01/2006	$0	24351-0386	Sales which are disqualified as a result of examination of the deed

Version:

APPENDIX C
METHODOLOGY LETTER

25 April 2022

Josiel Ferrer-Diaz, P.E.,
Assistant Transportation Director
City of Miami Beach
1688 Meridian Ave, Suite 801,
Miami Beach, FL 33139

Re: Traffic Analysis Methodology
MSMC Cancer Center
Langan Project No.: 330089601

Dear Mr. Ferrer:

Langan Engineering and Environmental Services, Inc. was retained to prepare a traffic-impact analysis for the proposed Mount Sinai Medical Center (MSMC) Cancer Center development expected to be built by 2025. The proposed development will comprise a 216,558 square-foot cancer center (hospital) and will be located in the southwest corner of the existing Mt. Sinai Medical Center Campus in Miami Beach, Florida (see Figure 1 below). The approximately 5.30-acre site is currently occupied by a surface parking lot that serves the general public and the Mater Academy Mount Sinai campus. A copy of the site plan for the proposed project is included in Attachment A. Please accept this letter as the traffic-analysis methodology for the proposed development.

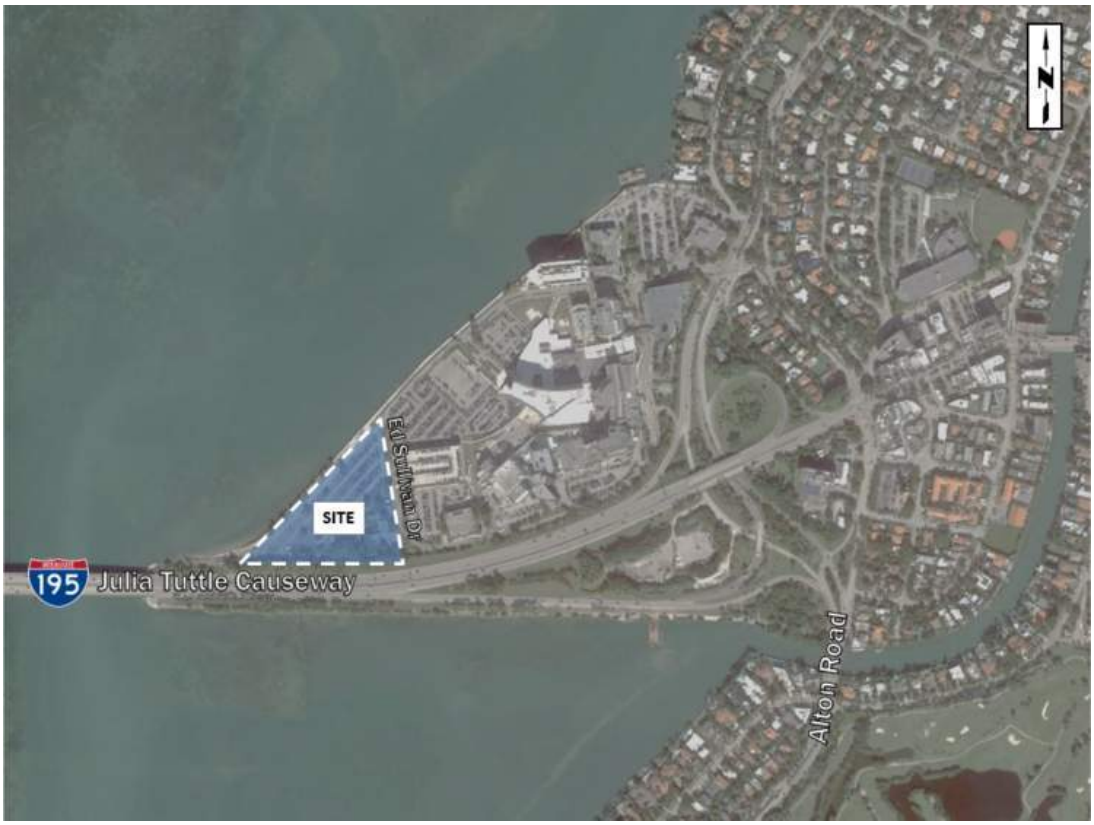


Figure 1 – Site Aerial Photograph

Trip Generation

Trip generation will be based on information contained in the Institute of Transportation Engineer's (ITE), Trip Generation Manual, 11th Edition. We applied a 12.6% multimodal reduction based on census data and per recommendation by the City of Miami Beach. The proposed development is expected to generate 2,038 daily, 156 morning and 163 afternoon peak-hour net new trips as summarized in **Table 1** below. The trip generation data are included in Attachment B.

Table 1 - Trip Generation Estimates

Use	Size	Daily	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
MSMC Cancer Center (Hospital)	216,558 SF	2,038	104	52	156	57	106	163

Data Collection

Morning and afternoon peak hour turning movement data will be collected on a typical weekday at the following intersections:

- Alton Road and 47th Street
- Alton Road and 43rd Street
- Alton Road and 41st Street
- Alton Road and Chase Avenue

Data will be collected for four hours between 7:00 and 9:00 AM and between 4:00 and 6:00 PM and will be adjusted to include a COVID adjustment factor by comparing 2020 synopsis data to 2022 counts along the same segment of roadway impacted by the development to convert traffic into peak-season traffic volumes.

In addition, we will collect 24 hour data on a typical weekday at the following locations:

- Westbound on-ramp to I-195 / Julia Tuttle Causeway
- Eastbound I-195 / Julia Tuttle Causeway off-ramp to Alton Road

In order to assess queueing on the roadway network, we will collect four hours of morning and four hours of afternoon queueing data along the following roadway segments:

- Westbound on-ramp to I-195 / Julia Tuttle Causeway between the Causeway and Edward Sullivan Drive
- Eastbound I-195 / Julia Tuttle Causeway off-ramp to Alton Road between the Causeway and Alton Road
- The northbound approach to Alton Road and 41st Street
- The northbound approach to Alton Road and 43rd Street

Project Distribution

Project trip distribution will be based on the cardinal distribution for Traffic Analysis Zones 629 of the Miami-Dade County 2045 Transportation Model. **Table 2** below shows the interpolated cardinal distribution based on a 2025 build out year. Attachment B includes the cardinal distribution data.

Table 2 - Cardinal Distribution

Year	NNE	ENE	ESE	SSE	SSW	WSW	WNW	NNW
2015	10.50%	4.20%	2.60%	12.60%	13.00%	28.30%	12.70%	16.00%
2045	9.90%	3.60%	2.20%	9.90%	10.60%	35.40%	13.90%	14.60%
2025	**10.30%**	**4.00%**	**2.47%**	**11.70%**	**12.20%**	**30.67%**	**13.10%**	**15.53%**

Future Traffic

We will develop future traffic volumes by applying a compound growth rate to the collected traffic data. The growth rate will be based on FDOT historical data from traffic count stations near the project. A one-half percent annual growth rate will be used if a negative growth rate is determined. We will review the county's platting database and include traffic from any approved but unbuilt projects. We will also include any roadway improvements planned within the first three years of the county's Transportation Improvement Program.

Intersection Analysis

Intersection capacity analysis will be performed for the study intersections using software based on the Highway Capacity Manual methodology. The analysis will be performed for morning and afternoon peak-hour conditions using Synchro Software. The analysis scenarios will include the existing (2022), no-build (2025 without project) and build (2025 with project) conditions. Project driveways will be analyzed for the build conditions. We will provide tables in the appendices that summarize the LOS and delay for each intersection and intersection approaches for the existing, no-build and build conditions. Tables summarizing the LOS and delay for each intersection and intersection approaches for the existing, no-build and build conditions will be included in the report appendices. We will include Synchro reports for 95th percentile queue lengths and tables summarizing this information for all exclusive turn-lanes. We will evaluate the need for exclusive left and right turn lanes on abutting public roads for the project driveways. We will provide gate-queuing analysis if the development proposed gate-controlled access.

Valet Operation Queueing Analysis

A queueing analysis for the proposed development's valet operations will be performed at all valet locations. We will use the queueing-analysis methodology from the *Transportation and Land Development* published by the ITE. This methodology requires hourly rates of vehicle arrival and service times for the valet operations to determine the vehicle-queue lengths. We will include the 95th %tile queue lengths and tables summarizing this information.

Report

The study methodology, analysis and findings will be summarized in a report that will be signed and sealed by a Florida registered professional engineer. Synchro LOS, queuing and timing reports will be included in report's appendices. If you have any questions regarding the information contained herein, please do not hesitate to contact me at (954) 320-2155.

Sincerely,

Langan Engineering and Environmental Services, Inc.

Maximo G. Polanco, P.E.
Project Engineer

MGP:mgp

Attachments

Attachment A – Preliminary Site Plan
Attachment B – Trip Generation & TAZ Data

\\langan.com\data\FTL\data6\330089601\Project Data\Correspondence\Methodology\2022-04-25 MSMC Cancer Center Traffic Methodology.docx

APPENDIX D
TRAFFIC, TAZ, SIGNAL TIMING & FDOT DATA

National Data & Surveying Services Intersection Turning Movement Count

Location: Alton Rd & I-195/SR 112/W 41st St/Arthur Godfrey Rd
City: Miami Beach
Control: Signalized

Project ID: 22-140217-003
Date: 5/5/2022

Data - Total

NS/EW Streets:	Alton Rd				Alton Rd				I-195/SR 112/W 41st St/Arthur Godfrey Rd				I-195/SR 112/W 41st St/Arthur Godfrey Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	15	8	5	0	7	6	27	0	57	336	9	1	2	200	8	0	681
7:15 AM	21	12	10	0	7	20	25	0	52	300	26	1	6	205	12	0	697
7:30 AM	47	37	6	0	7	39	30	0	57	234	36	0	12	218	12	0	735
7:45 AM	38	27	11	0	8	26	17	0	65	338	33	1	3	217	9	0	793
8:00 AM	18	32	14	0	11	22	32	0	53	326	12	1	11	232	16	0	780
8:15 AM	13	25	6	0	15	13	31	0	57	318	12	0	8	247	16	0	761
8:30 AM	18	35	15	0	13	24	33	0	63	261	14	0	9	281	11	0	777
8:45 AM	28	54	15	0	13	22	53	0	77	284	14	2	11	213	16	0	802
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	198	230	82	0	81	172	248	0	481	2397	156	6	62	1813	100	0	6026
APPROACH %'s :	38.82%	45.10%	16.08%	0.00%	16.17%	34.33%	49.50%	0.00%	15.82%	78.85%	5.13%	0.20%	3.14%	91.80%	5.06%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	77	146	50	0	52	81	149	0	250	1189	52	3	39	973	59	0	3120
PEAK HR FACTOR :	0.688	0.676	0.833	0.000	0.867	0.844	0.703	0.000	0.812	0.912	0.929	0.375	0.886	0.866	0.922	0.000	0.973
	0.704				0.801				0.953				0.890				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	52	25	9	0	13	14	63	0	33	308	11	2	3	341	8	0	882
4:15 PM	53	24	19	0	14	26	76	0	26	266	10	1	5	338	6	0	864
4:30 PM	37	21	12	0	19	31	86	0	24	358	18	1	5	366	11	0	989
4:45 PM	49	24	8	0	17	25	75	1	32	320	20	1	7	378	7	0	964
5:00 PM	51	27	15	0	18	29	84	0	29	292	7	0	5	362	7	0	926
5:15 PM	38	24	16	0	16	14	85	0	29	309	13	1	3	384	7	0	939
5:30 PM	79	25	10	0	13	17	73	0	34	331	10	0	2	351	14	0	959
5:45 PM	56	17	14	0	13	9	72	0	34	296	3	6	3	352	8	0	883
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	415	187	103	0	123	165	614	1	241	2480	92	12	33	2872	68	0	7406
APPROACH %'s :	58.87%	26.52%	14.61%	0.00%	13.62%	18.27%	68.00%	0.11%	8.53%	87.79%	3.26%	0.42%	1.11%	96.60%	2.29%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	175	96	51	0	70	99	330	1	114	1279	58	3	20	1490	32	0	3818
PEAK HR FACTOR :	0.858	0.889	0.797	0.000	0.921	0.798	0.959	0.250	0.891	0.893	0.725	0.750	0.714	0.970	0.727	0.000	0.965
	0.866				0.919				0.906				0.978				

PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	116	121	37	0	41	100	110	0	232	1216	93	2	34	914	53	0	3069

PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	224	93	55	0	60	69	314	0	126	1228	33	7	13	1449	36	0	3707

Prepared by National Data & Surveying Services

Alton Rd & I-195/SR 112/W 41st St/Arthur Godfrey Rd

Peak Hour Turning Movement Count

ID: 22-140217-003
City: Miami Beach

Day: Thursday
Date: 5/5/2022

PEAK HOURS	COUNT PERIODS
08:00 AM - 09:00 AM	7:00 AM - 09:00 AM
NONE	NONE
04:30 PM - 05:30 PM	4:00 PM - 06:00 PM

CONTROL: Signalized

	TEV	AM	NOON	PM
	3120	0	3818	
PHF		0.97		0.97

SOUTHBOUND (Alton Rd)

	L	T	R	U	Total	
AM	149	81	52	0	455	AM
NOON	0	0	0	0	0	NOON
PM	330	99	70	1	243	PM

EASTBOUND (I-195/SR 112/W 41st St/Arthur Godfrey Rd)

	L	T	R	U	Total	
AM	3	0	3	0	0	AM
NOON	250	0	114	0	0	NOON
PM	1189	0	1279	0	0	PM
	52	0	58	0	0	
	1202	0	1998	0	0	

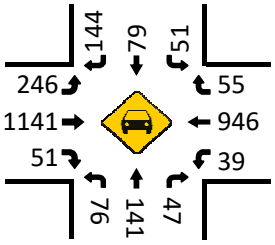
WESTBOUND (I-195/SR 112/W 41st St/Arthur Godfrey Rd)

	L	T	R	U	Total	
PM	32	0	59	0	0	PM
NOON	1490	0	973	0	0	NOON
AM	20	0	39	0	0	AM
	0	0	0	0	0	
	1400	0	1291	0	0	

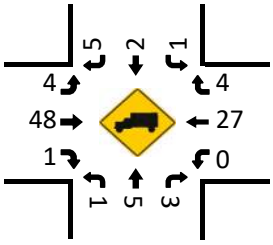
NORTHBOUND (Alton Rd)

	L	T	R	U	Total	
PM	177	0	175	96	51	PM
NOON	0	0	0	0	0	NOON
AM	172	0	77	146	50	AM

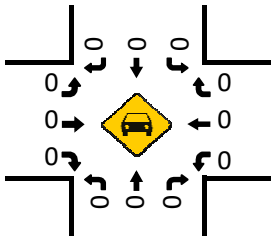
Cars (AM)



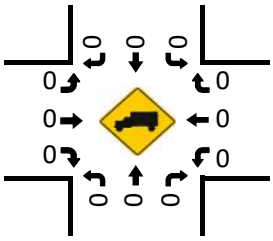
HT (AM)



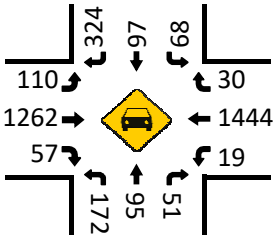
Cars (NOON)



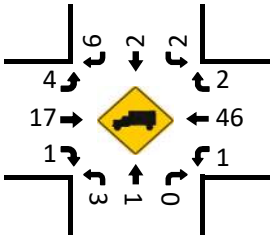
HT (NOON)



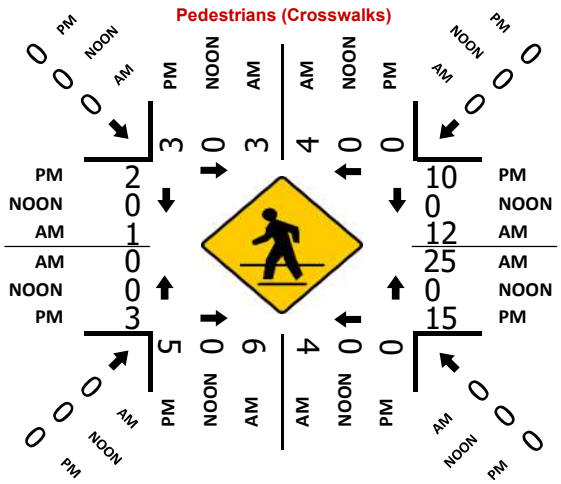
Cars (PM)



HT (PM)



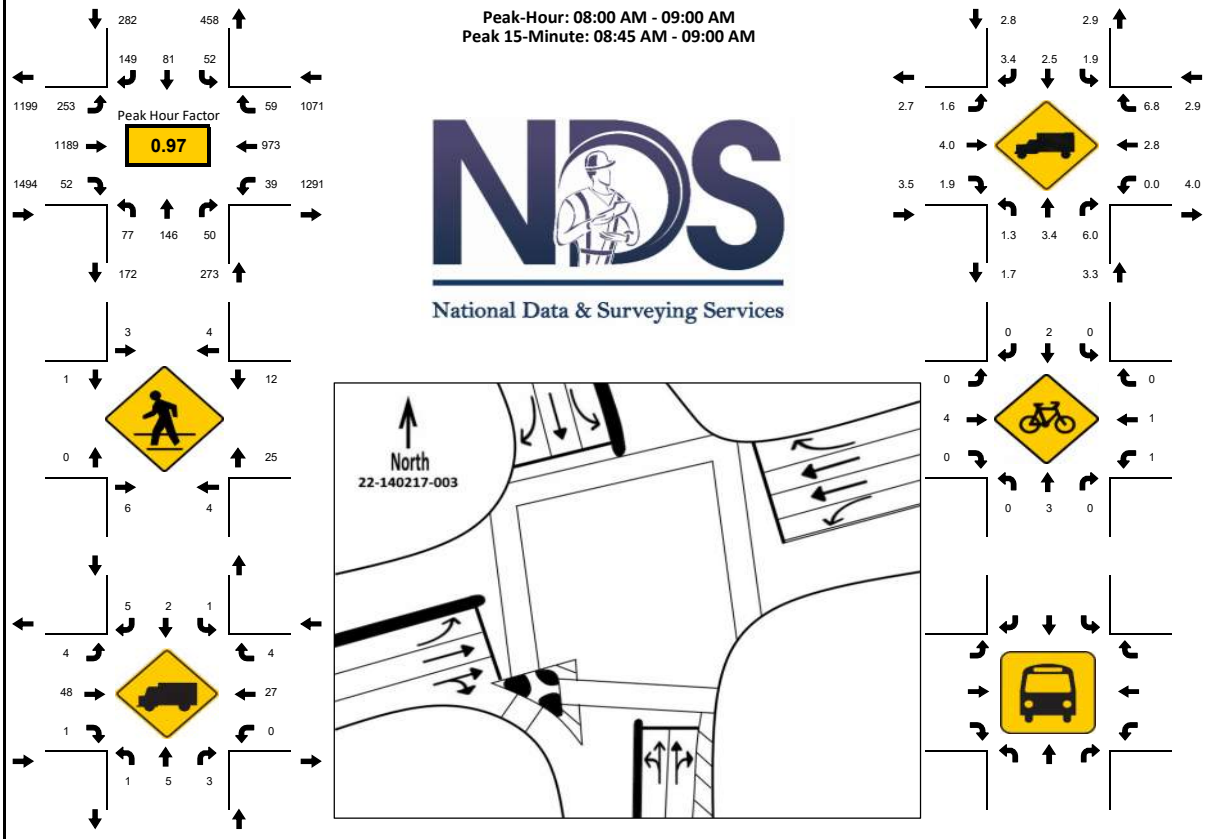
Pedestrians (Crosswalks)



LOCATION: Alton Rd & I-195/SR 112/W 41st St/Arthur Godfrey Rd
CITY/STATE: Miami Beach, FL

PROJECT ID: 22-140217-003
DATE: Thu, May 05, 2022

Peak-Hour: 08:00 AM - 09:00 AM
Peak 15-Minute: 08:45 AM - 09:00 AM

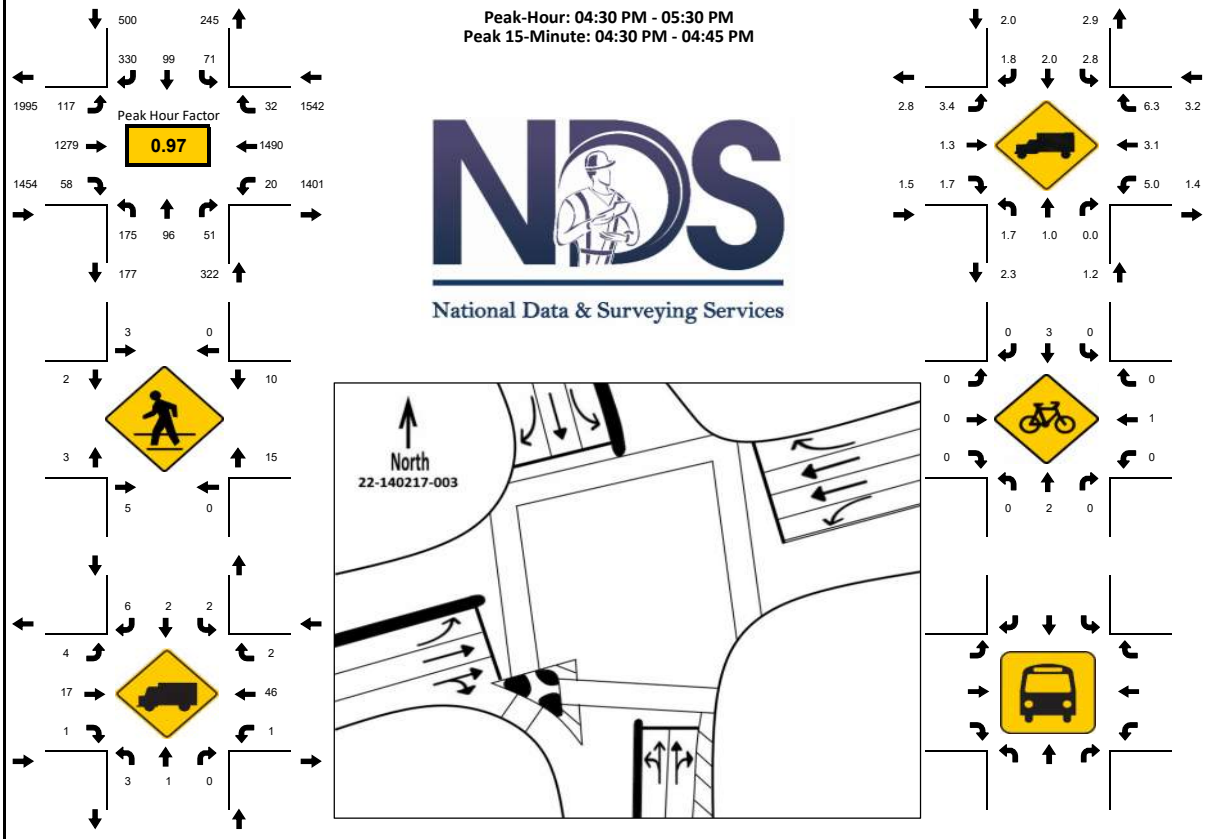


15-Min Count Period Beginning At	Alton Rd Northbound					Alton Rd Southbound					/SR 112/W 41st St/Arthur Godfre Eastbound					/SR 112/W 41st St/Arthur Godfre Westbound					Total	Hourly Total
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
07:00 AM	15	8	5	0		7	6	27	0		57	336	9	1		2	200	8	0		681	2906
07:15 AM	21	12	10	0		7	20	25	0		52	300	26	1		6	205	12	0		697	3005
07:30 AM	47	37	6	0		7	39	30	0		57	234	36	0		12	218	12	0		735	3069
07:45 AM	38	27	11	0		8	26	17	0		65	338	33	1		3	217	9	0		793	3111
08:00 AM	18	32	14	0		11	22	32	0		53	326	12	1		11	232	16	0		780	3120
08:15 AM	13	25	6	0		15	13	31	0		57	318	12	0		8	247	16	0		761	2340
08:30 AM	18	35	15	0		13	24	33	0		63	261	14	0		9	281	11	0		777	1579
08:45 AM	28	54	15	0		13	22	53	0		77	284	14	2		11	213	16	0		802	802
Peak 15-Min Flowrates	**Northbound**					**Southbound**					**Eastbound**					**Westbound**					**Total**	
	Left	**Thru**	**Rgt**	**U**	**R***	**Left**	**Thru**	**Rgt**	**U**	**R***	**Left**	**Thru**	**Rgt**	**U**	**R***	**Left**	**Thru**	**Rgt**	**U**	**R***		
All Vehicles	112	216	60	0		60	96	212	0		308	1304	56	8		44	1124	64	0		**3664**	
Heavy Trucks	4	8	8	0		4	4	8	0		8	76	4	0		0	36	8	0		**168**	
Pedestrians		20					12					4					52				**88**	
Bicycles	0	8	0	0		0	8	0	0		0	12	0	0		4	4	0	0		**36**	
Buses																						
Stopped Buses																						

LOCATION: Alton Rd & I-195/SR 112/W 41st St/Arthur Godfrey Rd
CITY/STATE: Miami Beach, FL

PROJECT ID: 22-140217-003
DATE: Thu, May 05, 2022

Peak-Hour: 04:30 PM - 05:30 PM
Peak 15-Minute: 04:30 PM - 04:45 PM



National Data & Surveying Services

15-Min Count Period Beginning At	Alton Rd Northbound					Alton Rd Southbound					/SR 112/W 41st St/Arthur Godfre Eastbound					/SR 112/W 41st St/Arthur Godfre Westbound					Total	Hourly Total
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
04:00 PM	52	25	9	0		13	14	63	0		33	308	11	2		3	341	8	0		882	3699
04:15 PM	53	24	19	0		14	26	76	0		26	266	10	1		5	338	6	0		864	3743
04:30 PM	37	21	12	0		19	31	86	0		24	358	18	1		5	366	11	0		989	3818
04:45 PM	49	24	8	0		17	25	75	1		32	320	20	1		7	378	7	0		964	3788
05:00 PM	51	27	15	0		18	29	84	0		29	292	7	0		5	362	7	0		926	3707
05:15 PM	38	24	16	0		16	14	85	0		29	309	13	1		3	384	7	0		939	2781
05:30 PM	79	25	10	0		13	17	73	0		34	331	10	0		2	351	14	0		959	1842
05:45 PM	56	17	14	0		13	9	72	0		34	296	3	6		3	352	8	0		883	883
Peak 15-Min Flowrates	**Northbound**					**Southbound**					**Eastbound**					**Westbound**					**Total**	
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
All Vehicles	204	108	64	0		76	124	344	4		128	1432	80	4		28	1536	44	0		**4176**	
Heavy Trucks	8	4	0	0		4	4	12	0		8	24	4	0		4	60	4	0		**136**	
Pedestrians		16					8					8					40				**72**	
Bicycles	0	4	0	0		0	8	0	0		0	0	0	0		0	4	0	0		**16**	
Buses																						
Stopped Buses																						

National Data & Surveying Services Intersection Turning Movement Count

Location: SR 907/Alton Rd & N Bay Rd/Chase Ave
City: Miami Beach
Control: Signalized

Project ID: 22-140217-004
Date: 5/5/2022

Data - Total

NS/EW Streets:	SR 907/Alton Rd				SR 907/Alton Rd				N Bay Rd/Chase Ave				N Bay Rd/Chase Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	209	1	0	2	394	0	0	8	2	1	0	6	0	37	0	660
7:15 AM	0	239	4	0	1	376	0	1	12	2	0	0	4	0	47	0	686
7:30 AM	0	213	3	0	1	409	0	1	26	1	1	0	9	0	23	0	687
7:45 AM	0	200	10	0	1	426	0	0	19	8	2	0	7	0	44	0	717
8:00 AM	0	217	13	0	1	398	0	0	26	9	2	0	20	0	39	1	726
8:15 AM	0	260	43	0	0	385	0	1	17	14	4	0	21	0	35	0	780
8:30 AM	0	220	18	0	0	425	0	0	28	8	0	0	31	0	43	0	773
8:45 AM	0	265	23	1	0	454	0	1	21	11	0	0	25	0	34	0	835
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1823	115	1	6	3267	0	4	157	55	10	0	123	0	302	1	5864
APPROACH %'s :	0.00%	94.02%	5.93%	0.05%	0.18%	99.69%	0.00%	0.12%	70.72%	24.77%	4.50%	0.00%	28.87%	0.00%	70.89%	0.23%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	0	962	97	1	1	1662	0	2	92	42	6	0	97	0	151	1	3114
PEAK HR FACTOR :	0.000	0.908	0.564	0.250	0.250	0.915	0.000	0.500	0.821	0.750	0.375	0.000	0.782	0.000	0.878	0.250	0.932
		0.875				0.915				0.946				0.841			

NS/EW Streets:	SR 907/Alton Rd				SR 907/Alton Rd				N Bay Rd/Chase Ave				N Bay Rd/Chase Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	409	5	0	1	372	0	0	49	12	0	0	7	0	49	0	904
4:15 PM	0	390	4	0	1	389	0	0	49	3	0	0	2	0	47	0	885
4:30 PM	0	375	6	0	0	416	0	0	46	3	2	0	4	0	49	0	901
4:45 PM	0	365	9	0	0	386	0	0	64	7	0	0	5	0	50	0	886
5:00 PM	0	426	7	0	0	378	0	0	45	3	0	0	6	0	49	0	914
5:15 PM	0	420	6	0	3	385	0	0	42	0	1	0	10	0	57	0	924
5:30 PM	0	399	7	0	0	447	0	0	55	3	1	0	4	0	53	0	969
5:45 PM	0	419	5	0	0	416	0	0	46	4	0	0	10	0	58	0	958
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	3203	49	0	5	3189	0	0	396	35	4	0	48	0	412	0	7341
APPROACH %'s :	0.00%	98.49%	1.51%	0.00%	0.16%	99.84%	0.00%	0.00%	91.03%	8.05%	0.92%	0.00%	10.43%	0.00%	89.57%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	1664	25	0	3	1626	0	0	188	10	2	0	30	0	217	0	3765
PEAK HR FACTOR :	0.000	0.977	0.893	0.000	0.250	0.909	0.000	0.000	0.855	0.625	0.500	0.000	0.750	0.000	0.935	0.000	0.971
		0.975				0.911				0.847				0.908			

PEAK HR :	7:30 AM - 8:30 AM																TOTAL
PEAK HR VOL :	0	890	69	0	3	1618	0	2	88	32	9	0	57	0	141	1	2910

Prepared by National Data & Surveying Services

SR 907/Alton Rd & N Bay Rd/Chase Ave

Peak Hour Turning Movement Count

ID: 22-140217-004
City: Miami Beach

Day: Thursday
Date: 5/5/2022

PEAK HOURS	
AM	08:00 AM - 09:00 AM
NOON	NONE
PM	05:00 PM - 06:00 PM

COUNT PERIODS	
AM	7:00 AM - 09:00 AM
NOON	NONE
PM	4:00 PM - 06:00 PM

SOUTHBOUND (SR 907/Alton Rd)

AM	0	1662	1	2	1207	AM
NOON	0	0	0	0	0	NOON
PM	0	1626	3	0	2069	PM

EASTBOUND (N Bay Rd/Chase Ave)

AM	NOON	PM	
0	0	0	
0	0	0	0
92	0	188	0
42	0	10	0
6	0	2	0
AM	NOON	PM	

WESTBOUND (N Bay Rd/Chase Ave)

PM	NOON	AM	
217	0	151	0
0	0	0	0
30	0	97	0
0	0	1	0
38	0	141	
PM	NOON	AM	

NORTHBOUND (SR 907/Alton Rd)

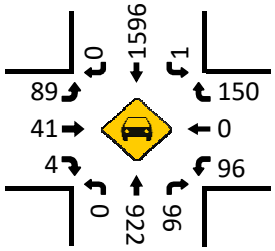
PM	1658	0	0	1664	25	PM
NOON	0	0	0	0	0	NOON
AM	1766	1	0	962	97	AM

CONTROL

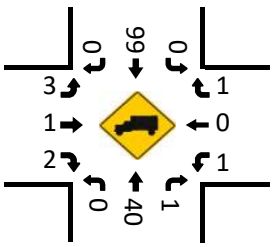
Signalized

TEV	3114 AM	0 NOON	3765 PM
PHF	0.93		0.97

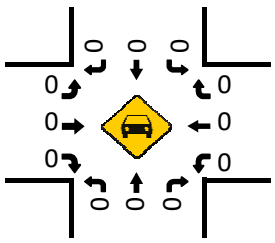
Cars (AM)



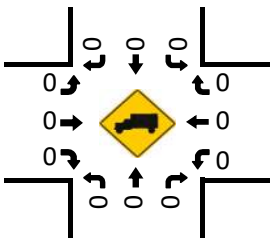
HT (AM)



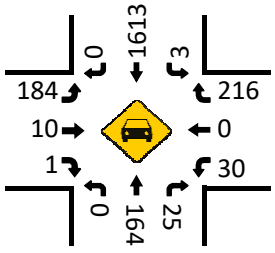
Cars (NOON)



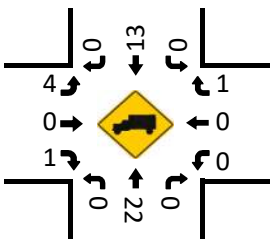
HT (NOON)



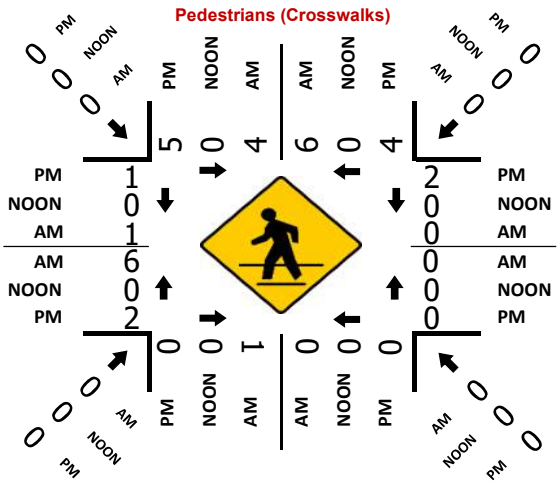
Cars (PM)



HT (PM)



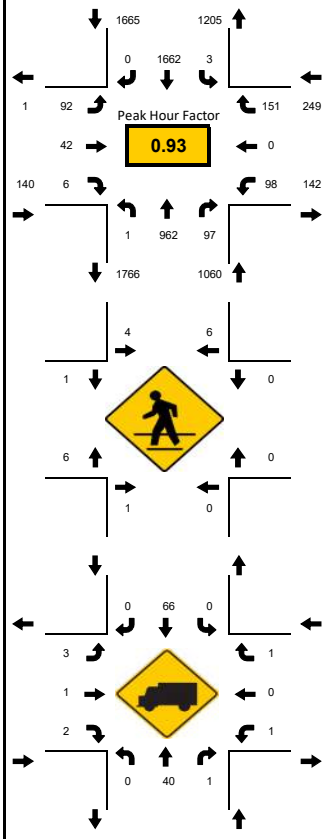
Pedestrians (Crosswalks)

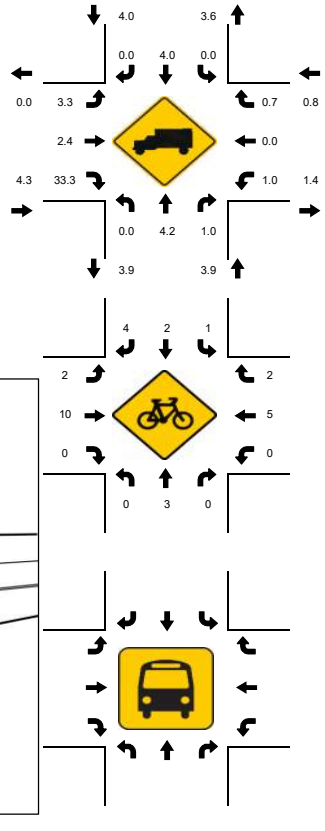


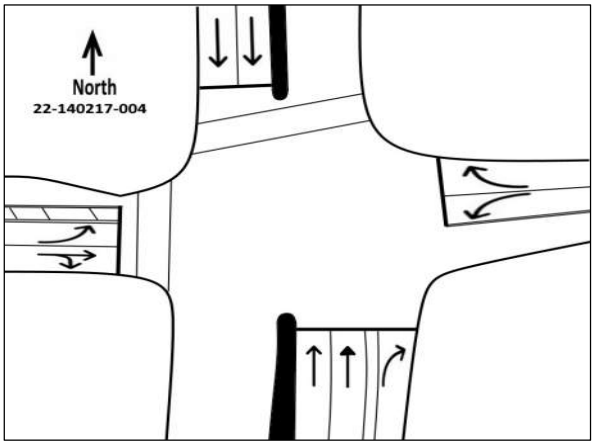
LOCATION: SR 907/Alton Rd & N Bay Rd/Chase Ave
CITY/STATE: Miami Beach, FL

PROJECT ID: 22-140217-004
DATE: Thu, May 05, 2022

Peak-Hour: 08:00 AM - 09:00 AM
Peak 15-Minute: 08:45 AM - 09:00 AM





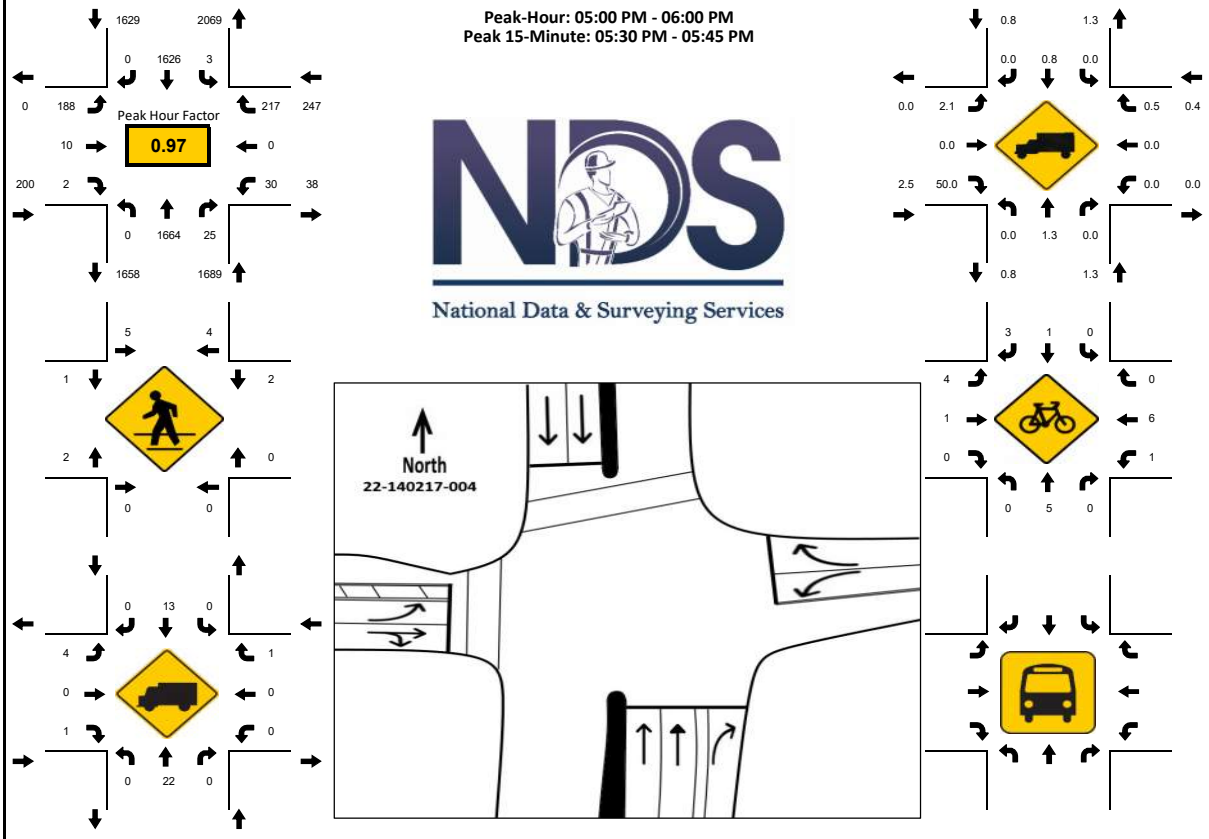


15-Min Count Period Beginning At	SR 907/Alton Rd Northbound					SR 907/Alton Rd Southbound					N Bay Rd/Chase Ave Eastbound					N Bay Rd/Chase Ave Westbound					Total	Hourly Total
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
07:00 AM	0	209	1	0		2	394	0	0		8	2	1	0		6	0	37	0		660	2750
07:15 AM	0	239	4	0		1	376	0	1		12	2	0	0		4	0	47	0		686	2816
07:30 AM	0	213	3	0		1	409	0	1		26	1	1	0		9	0	23	0		687	2910
07:45 AM	0	200	10	0		1	426	0	0		19	8	2	0		7	0	44	0		717	2996
08:00 AM	0	217	13	0		1	398	0	0		26	9	2	0		20	0	39	1		726	3114
08:15 AM	0	260	43	0		0	385	0	1		17	14	4	0		21	0	35	0		780	2388
08:30 AM	0	220	18	0		0	425	0	0		28	8	0	0		31	0	43	0		773	1608
08:45 AM	0	265	23	1		0	454	0	1		21	11	0	0		25	0	34	0		835	835
Peak 15-Min Flowrates	**Northbound**					**Southbound**					**Eastbound**					**Westbound**					**Total**	
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
All Vehicles	0	1060	172	4		4	1816	0	4		112	56	16	0		124	0	172	4		**3544**	
Heavy Trucks	0	48	4	0		0	104	0	0		4	4	8	0		4	0	4	0		**180**	
Pedestrians		4					20					12					0				**36**	
Bicycles	0	4	0	0		4	4	8	0		4	24	0	0		0	8	4	0		**60**	
Buses																						
Stopped Buses																						

LOCATION: SR 907/Alton Rd & N Bay Rd/Chase Ave
CITY/STATE: Miami Beach, FL

PROJECT ID: 22-140217-004
DATE: Thu, May 05, 2022

Peak-Hour: 05:00 PM - 06:00 PM
Peak 15-Minute: 05:30 PM - 05:45 PM



15-Min Count Period Beginning At	SR 907/Alton Rd Northbound					SR 907/Alton Rd Southbound					N Bay Rd/Chase Ave Eastbound					N Bay Rd/Chase Ave Westbound					Total	Hourly Total
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
04:00 PM	0	409	5	0		1	372	0	0		49	12	0	0		7	0	49	0		904	3576
04:15 PM	0	390	4	0		1	389	0	0		49	3	0	0		2	0	47	0		885	3586
04:30 PM	0	375	6	0		0	416	0	0		46	3	2	0		4	0	49	0		901	3625
04:45 PM	0	365	9	0		0	386	0	0		64	7	0	0		5	0	50	0		886	3693
05:00 PM	0	426	7	0		0	378	0	0		45	3	0	0		6	0	49	0		914	3765
05:15 PM	0	420	6	0		3	385	0	0		42	0	1	0		10	0	57	0		924	2851
05:30 PM	0	399	7	0		0	447	0	0		55	3	1	0		4	0	53	0		969	1927
05:45 PM	0	419	5	0		0	416	0	0		46	4	0	0		10	0	58	0		958	958
Peak 15-Min Flowrates	**Northbound**					**Southbound**					**Eastbound**					**Westbound**					**Total**	
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
All Vehicles	0	1704	28	0		12	1788	0	0		220	16	4	0		40	0	232	0		**4044**	
Heavy Trucks	0	32	0	0		0	24	0	0		8	0	4	0		0	0	4	0		**72**	
Pedestrians		0					36					12					8				**56**	
Bicycles	0	8	0	0		0	4	8	0		8	4	0	0		4	8	0	0		**44**	
Buses																						
Stopped Buses																						

National Data & Surveying Services Intersection Turning Movement Count

Location: SR 907/Alton Rd & W 47th St
City: Miami Beach
Control: Signalized

Project ID: 22-140217-001
Date: 5/5/2022

Data - Total

NS/EW Streets:	SR 907/Alton Rd				SR 907/Alton Rd				W 47th St				W 47th St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	2	194	2	1	1	315	0	0	2	0	1	0	3	1	1	0	523
7:15 AM	3	225	9	2	4	350	0	1	1	1	1	0	3	0	1	0	601
7:30 AM	3	264	7	1	7	400	1	0	1	2	1	0	4	3	2	0	696
7:45 AM	5	298	7	0	12	391	1	0	3	3	3	0	6	0	4	0	733
8:00 AM	5	302	10	0	12	401	0	0	5	0	0	0	3	3	8	0	749
8:15 AM	7	267	13	2	19	347	2	0	2	5	2	0	6	0	9	0	681
8:30 AM	1	263	18	0	15	244	1	0	4	4	2	0	8	2	11	0	573
8:45 AM	3	295	20	0	17	399	3	0	2	2	2	0	7	0	13	0	763
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	29	2108	86	6	87	2847	8	1	20	17	12	0	40	9	49	0	5319
APPROACH %'s :	1.30%	94.57%	3.86%	0.27%	2.96%	96.74%	0.27%	0.03%	40.82%	34.69%	24.49%	0.00%	40.82%	9.18%	50.00%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	20	1131	37	3	50	1539	4	0	11	10	6	0	19	6	23	0	2859
PEAK HR FACTOR :	0.714	0.936	0.712	0.375	0.658	0.959	0.500	0.000	0.550	0.500	0.500	0.000	0.792	0.500	0.639	0.000	0.954
	0.939				0.964				0.750				0.800				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	4	331	9	1	10	197	1	0	4	2	3	0	9	2	11	0	584
4:15 PM	4	316	10	0	9	372	1	0	5	2	4	0	9	2	9	0	743
4:30 PM	6	310	4	1	18	265	3	0	1	2	5	0	12	7	8	0	642
4:45 PM	4	314	10	0	24	244	2	0	3	1	4	0	3	2	9	0	620
5:00 PM	2	316	7	1	26	245	0	0	6	3	3	0	4	1	6	0	620
5:15 PM	3	329	9	0	21	243	0	0	4	4	0	0	6	4	5	0	628
5:30 PM	1	362	7	0	27	239	0	0	4	5	1	0	3	1	11	0	661
5:45 PM	1	369	7	1	6	275	3	0	3	3	1	0	7	4	6	0	686
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	25	2647	63	4	141	2080	10	0	30	22	21	0	53	23	65	0	5184
APPROACH %'s :	0.91%	96.64%	2.30%	0.15%	6.32%	93.23%	0.45%	0.00%	41.10%	30.14%	28.77%	0.00%	37.59%	16.31%	46.10%	0.00%	
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	16	1256	31	2	77	1126	6	0	15	8	16	0	28	12	32	0	2625
PEAK HR FACTOR :	0.667	0.994	0.775	0.500	0.740	0.757	0.500	0.000	0.625	0.667	0.800	0.000	0.583	0.429	0.889	0.000	0.883
	0.989				0.791				0.813				0.667				

PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	7	1376	30	2	80	1002	3	0	17	15	5	0	20	10	28	0	2595

Prepared by National Data & Surveying Services

SR 907/Alton Rd & W 47th St

Peak Hour Turning Movement Count

ID: 22-140217-001
City: Miami Beach

Day: Thursday
Date: 5/5/2022

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	7:00 AM - 09:00 AM
NONE	NONE
04:15 PM - 05:15 PM	4:00 PM - 06:00 PM

SOUTHBOUND (SR 907/Alton Rd)

AM	4	1539	50	0	1165	AM
NOON	0	0	0	0	0	NOON
PM	6	1126	77	0	1303	PM

EASTBOUND (W 47th St)

AM	NOON	PM	
30	0	34	
0	0	0	0
11	0	15	0
10	0	8	0
6	0	16	0
AM	NOON	PM	

WESTBOUND (W 47th St)

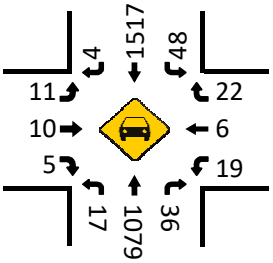
PM	NOON	AM	
32	0	23	0
12	0	6	0
28	0	19	0
0	0	0	0
116	0	97	
PM	NOON	AM	

NORTHBOUND (SR 907/Alton Rd)

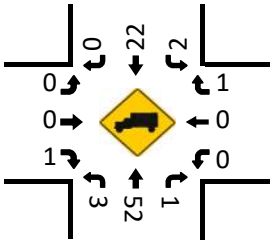
PM	1172	2	16	1256	31	PM
NOON	0	0	0	0	0	NOON
AM	1567	3	20	1131	37	AM

CONTROL			
Signalized			
TEV	2859 AM	0 NOON	2625 PM
PHF	0.95		0.88

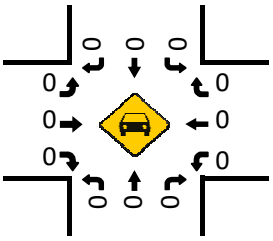
Cars (AM)



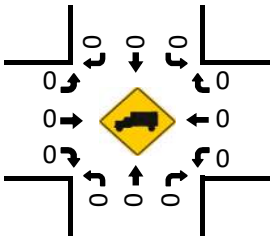
HT (AM)



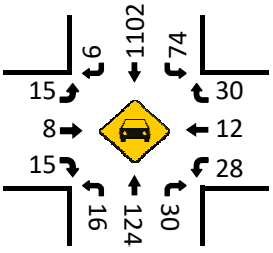
Cars (NOON)



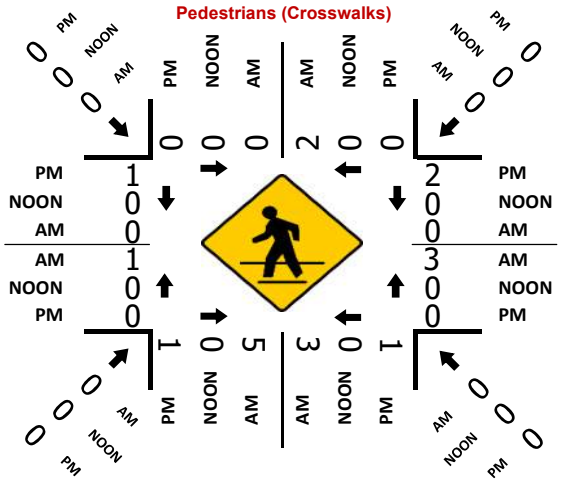
HT (NOON)



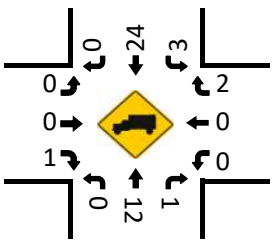
Cars (PM)



Pedestrians (Crosswalks)



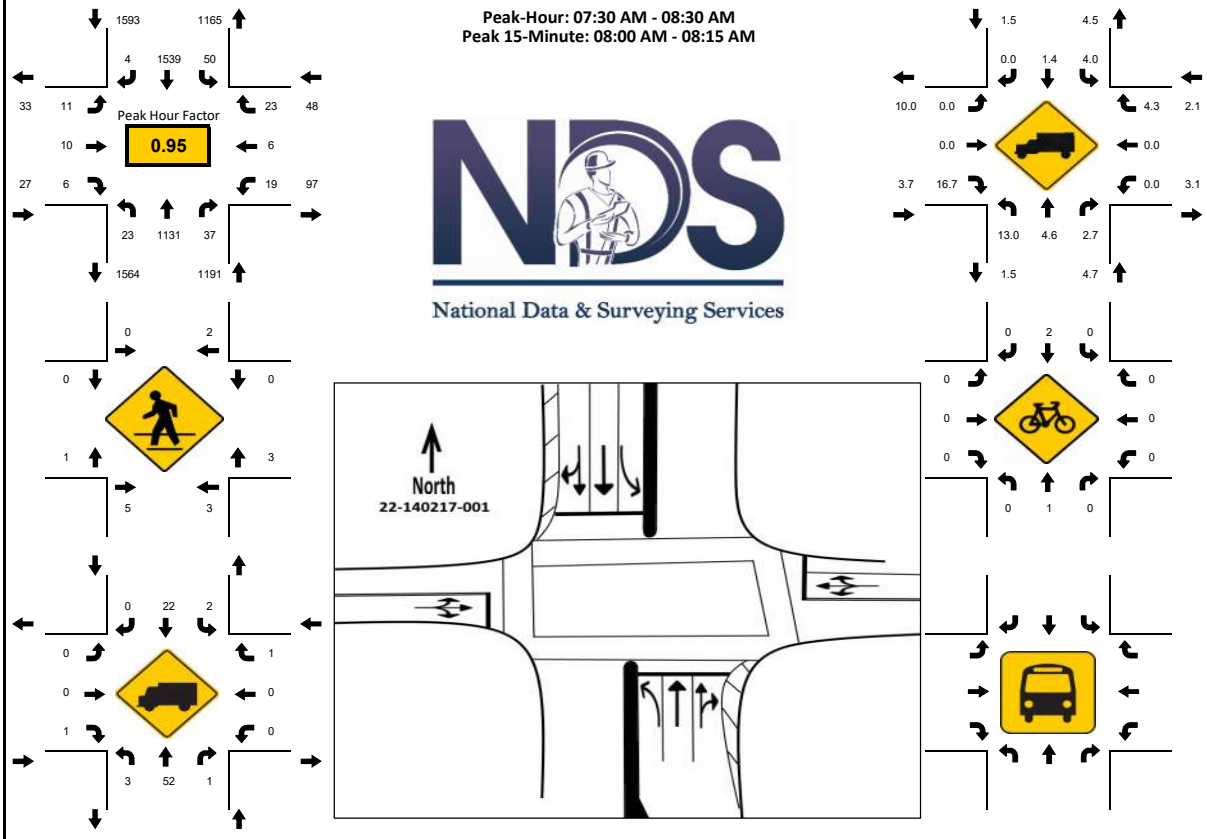
HT (PM)



LOCATION: SR 907/Alton Rd & W 47th St
CITY/STATE: Miami Beach, FL

PROJECT ID: 22-140217-001
DATE: Thu, May 05, 2022

Peak-Hour: 07:30 AM - 08:30 AM
Peak 15-Minute: 08:00 AM - 08:15 AM



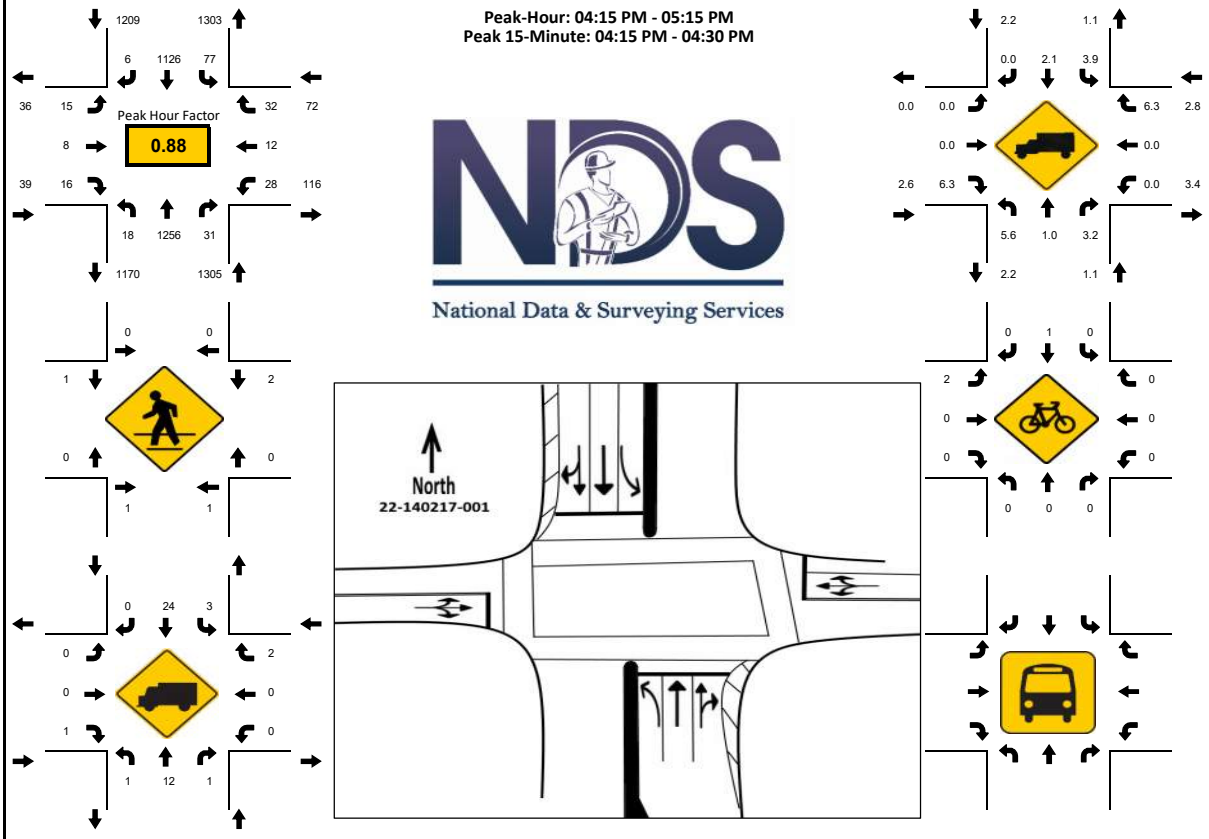
National Data & Surveying Services

15-Min Count Period Beginning At	SR 907/Alton Rd Northbound					SR 907/Alton Rd Southbound					W 47th St Eastbound					W 47th St Westbound					Total	Hourly Total
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
07:00 AM	2	194	2	1		1	315	0	0		2	0	1	0		3	1	1	0		523	2553
07:15 AM	3	225	9	2		4	350	0	1		1	1	1	0		3	0	1	0		601	2779
07:30 AM	3	264	7	1		7	400	1	0		1	2	1	0		4	3	2	0		696	2859
07:45 AM	5	298	7	0		12	391	1	0		3	3	3	0		6	0	4	0		733	2736
08:00 AM	5	302	10	0		12	401	0	0		5	0	0	0		3	3	8	0		749	2766
08:15 AM	7	267	13	2		19	347	2	0		2	5	2	0		6	0	9	0		681	2017
08:30 AM	1	263	18	0		15	244	1	0		4	4	2	0		8	2	11	0		573	1336
08:45 AM	3	295	20	0		17	399	3	0		2	2	2	0		7	0	13	0		763	763
Peak 15-Min Flowrates	**Northbound**					**Southbound**					**Eastbound**					**Westbound**					**Total**	
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
All Vehicles	28	1208	52	8		76	1604	8	0		20	20	12	0		24	12	36	0		**3108**	
Heavy Trucks	4	60	4	0		4	32	0	0		0	0	4	0		0	0	4	0		**112**	
Pedestrians		12					8					4					8				**32**	
Bicycles	0	4	0	0		0	8	0	0		0	0	0	0		0	0	0	0		**12**	
Buses																						
Stopped Buses																						

LOCATION: SR 907/Alton Rd & W 47th St
CITY/STATE: Miami Beach, FL

PROJECT ID: 22-140217-001
DATE: Thu, May 05, 2022

Peak-Hour: 04:15 PM - 05:15 PM
Peak 15-Minute: 04:15 PM - 04:30 PM



15-Min Count Period Beginning At	SR 907/Alton Rd Northbound					SR 907/Alton Rd Southbound					W 47th St Eastbound					W 47th St Westbound					Total	Hourly Total
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
04:00 PM	4	331	9	1		10	197	1	0		4	2	3	0		9	2	11	0		584	2589
04:15 PM	4	316	10	0		9	372	1	0		5	2	4	0		9	2	9	0		743	2625
04:30 PM	6	310	4	1		18	265	3	0		1	2	5	0		12	7	8	0		642	2510
04:45 PM	4	314	10	0		24	244	2	0		3	1	4	0		3	2	9	0		620	2529
05:00 PM	2	316	7	1		26	245	0	0		6	3	3	0		4	1	6	0		620	2595
05:15 PM	3	329	9	0		21	243	0	0		4	4	0	0		6	4	5	0		628	1975
05:30 PM	1	362	7	0		27	239	0	0		4	5	1	0		3	1	11	0		661	1347
05:45 PM	1	369	7	1		6	275	3	0		3	3	1	0		7	4	6	0		686	686
Peak 15-Min Flowrates	**Northbound**					**Southbound**					**Eastbound**					**Westbound**					**Total**	
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
All Vehicles	24	1264	40	4		104	1488	12	0		24	12	20	0		48	28	36	0		**3104**	
Heavy Trucks	0	20	4	4		8	40	0	0		0	0	4	0		0	0	8	0		**84**	
Pedestrians		8					0					4					8				**20**	
Bicycles	0	0	0	0		0	4	0	0		8	0	0	0		0	0	0	0		**12**	
Buses																						
Stopped Buses																						

National Data & Surveying Services Intersection Turning Movement Count

Location: SR 907/Alton Rd/N Bay Rd & 43rd St/Alton Rd
City: Miami Beach
Control: Signalized

Project ID: 22-140217-002
Date: 5/5/2022

Data - Total

NS/EW Streets:	SR 907/Alton Rd/N Bay Rd				SR 907/Alton Rd/N Bay Rd				43rd St/Alton Rd				43rd St/Alton Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	114	190	8	0	6	303	23	0	4	1	15	0	1	36	33	0	734
7:15 AM	124	221	2	2	15	304	28	0	4	3	18	0	0	23	26	0	770
7:30 AM	125	254	3	1	32	294	31	0	8	5	42	0	0	38	49	0	882
7:45 AM	141	294	9	0	18	375	39	0	8	2	35	0	1	30	55	2	1009
8:00 AM	132	269	8	0	18	352	45	0	8	8	29	0	1	24	39	1	934
8:15 AM	151	214	7	0	8	310	50	1	14	12	30	0	0	44	46	1	888
8:30 AM	123	274	5	0	9	207	24	0	14	14	26	1	2	31	32	0	762
8:45 AM	113	227	17	2	12	305	29	2	8	9	29	0	2	45	40	0	840
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1023	1943	59	5	118	2450	269	3	68	54	224	1	7	271	320	4	6819
APPROACH %'s :	33.76%	64.13%	1.95%	0.17%	4.15%	86.27%	9.47%	0.11%	19.60%	15.56%	64.55%	0.29%	1.16%	45.02%	53.16%	0.66%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	549	1031	27	1	76	1331	165	1	38	27	136	0	2	136	189	4	3713
PEAK HR FACTOR :	0.909	0.877	0.750	0.250	0.594	0.887	0.825	0.250	0.679	0.563	0.810	0.000	0.500	0.773	0.859	0.500	0.920
	0.905				0.910				0.897				0.909				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	33	281	13	0	23	241	16	0	35	13	45	1	4	18	37	1	761
4:15 PM	27	278	8	1	23	228	11	0	24	12	41	0	4	16	26	0	699
4:30 PM	31	277	19	2	23	187	11	2	31	20	40	0	6	10	35	0	694
4:45 PM	35	245	11	4	14	214	18	0	31	14	42	0	3	14	27	0	672
5:00 PM	23	260	13	1	20	198	16	1	32	20	45	0	2	12	36	0	679
5:15 PM	19	272	12	1	22	201	6	0	39	14	37	0	0	7	40	1	671
5:30 PM	15	294	14	3	13	216	9	0	17	18	27	0	6	13	42	1	688
5:45 PM	33	347	13	1	11	284	7	0	25	10	24	0	3	14	40	1	813
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	216	2254	103	13	149	1769	94	3	234	121	301	1	28	104	283	4	5677
APPROACH %'s :	8.35%	87.16%	3.98%	0.50%	7.39%	87.79%	4.67%	0.15%	35.62%	18.42%	45.81%	0.15%	6.68%	24.82%	67.54%	0.95%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	90	1173	52	6	66	899	38	1	113	62	133	0	11	46	158	3	2851
PEAK HR FACTOR :	0.682	0.845	0.929	0.500	0.750	0.791	0.594	0.250	0.724	0.775	0.739	0.000	0.458	0.821	0.940	0.750	0.877
	0.838				0.831				0.794				0.879				

Prepared by National Data & Surveying Services

SR 907/Alton Rd/N Bay Rd & 43rd St/Alton Rd

Peak Hour Turning Movement Count

ID: 22-140217-002
City: Miami Beach

Day: Thursday
Date: 5/5/2022

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	7:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	4:00 PM - 06:00 PM

SOUTHBOUND (SR 907/Alton Rd/N Bay Rd)

AM	165	1331	76	1	1259	AM
NOON	0	0	0	0	0	NOON
PM	38	899	66	1	1445	PM

EASTBOUND (43rd St/Alton Rd)

AM	NOON	PM	
850	0	174	
0	0	0	0
38	0	113	0
27	0	62	0
136	0	133	0
AM	NOON	PM	

WESTBOUND (43rd St/Alton Rd)

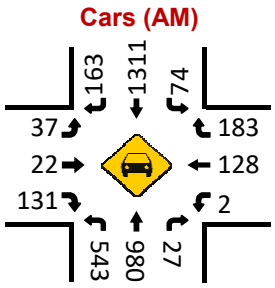
PM	NOON	AM	
158	0	189	0
46	0	136	0
11	0	2	0
3	0	4	0
183	0	134	
PM	NOON	AM	

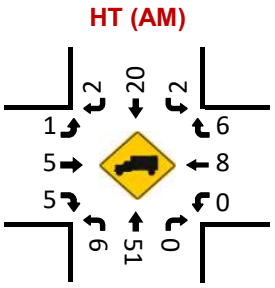
CONTROL: Signalized

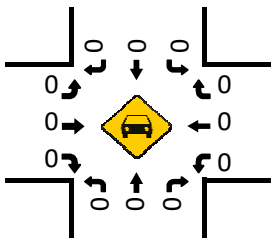
TEV	3713 AM	0 NOON	2851 PM
PHF	0.92		0.88

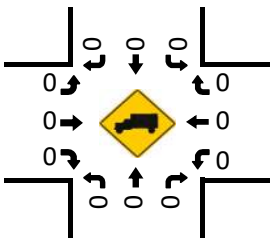
NORTHBOUND (SR 907/Alton Rd/N Bay Rd)

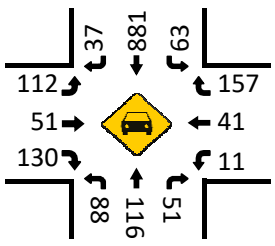
PM	1049	6	90	1173	52	PM
NOON	0	0	0	0	0	NOON
AM	1470	1	549	1031	27	AM

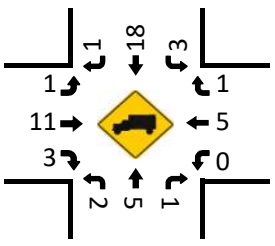


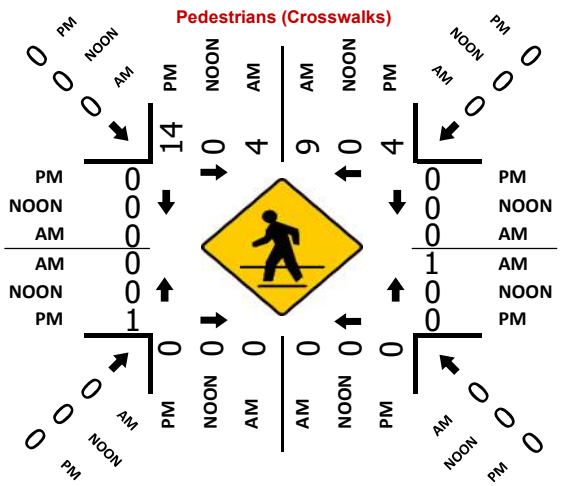








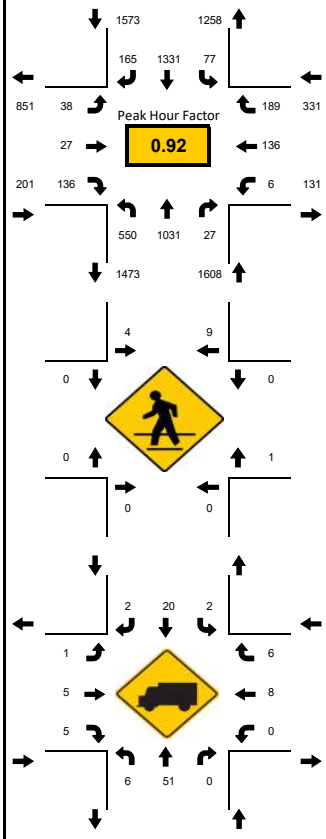


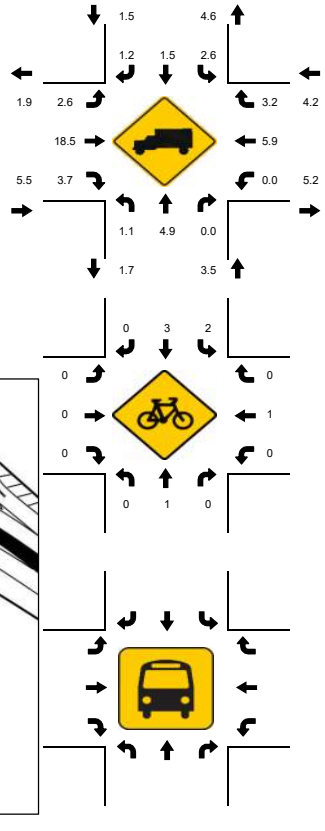


LOCATION: SR 907/Alton Rd/N Bay Rd & 43rd St/Alton Rd
CITY/STATE: Miami Beach, FL

PROJECT ID: 22-140217-002
DATE: Thu, May 05, 2022

Peak-Hour: 07:30 AM - 08:30 AM
Peak 15-Minute: 07:45 AM - 08:00 AM





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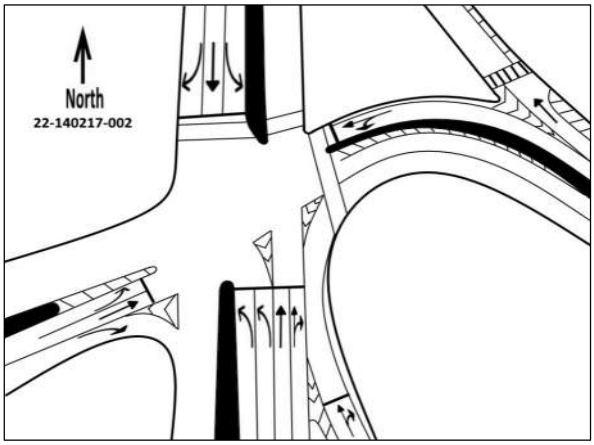
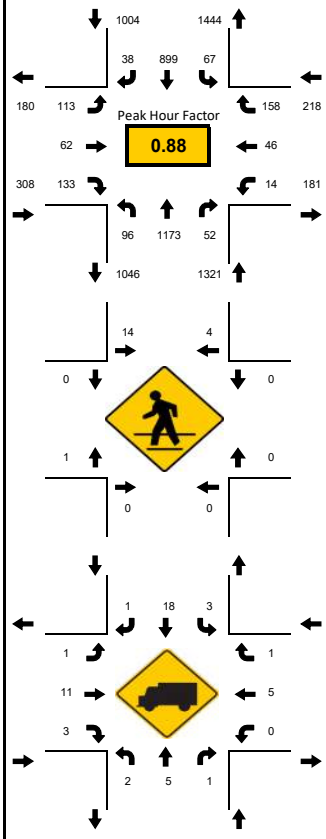


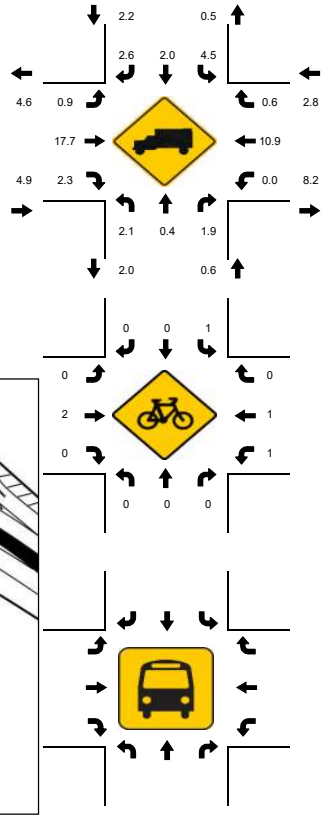
15-Min Count Period	SR 907/Alton Rd/N Bay Rd Northbound					SR 907/Alton Rd/N Bay Rd Southbound					43rd St/Alton Rd Eastbound					43rd St/Alton Rd Westbound						
Beginning At	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Total	Hourly Total
07:00 AM	114	190	8	0		6	303	23	0		4	1	15	0		1	36	33	0		734	3395
07:15 AM	124	221	2	2		15	304	28	0		4	3	18	0		0	23	26	0		770	3595
07:30 AM	125	254	3	1		32	294	31	0		8	5	42	0		0	38	49	0		882	3713
07:45 AM	141	294	9	0		18	375	39	0		8	2	35	0		1	30	55	2		1009	3593
08:00 AM	132	269	8	0		18	352	45	0		8	8	29	0		1	24	39	1		934	3424
08:15 AM	151	214	7	0		8	310	50	1		14	12	30	0		0	44	46	1		888	2490
08:30 AM	123	274	5	0		9	207	24	0		14	14	26	1		2	31	32	0		762	1602
08:45 AM	113	227	17	2		12	305	29	2		8	9	29	0		2	45	40	0		840	840
Peak 15-Min Flowrates	**Northbound**					**Southbound**					**Eastbound**					**Westbound**					**Total**	
	Left	**Thru**	**Rgt**	**U**	**R***	**Left**	**Thru**	**Rgt**	**U**	**R***	**Left**	**Thru**	**Rgt**	**U**	**R***	**Left**	**Thru**	**Rgt**	**U**	**R***		
All Vehicles	604	1176	36	4		128	1500	200	4		56	48	168	0		4	176	220	8		**4332**	
Heavy Trucks	12	60	0	0		4	32	8	0		4	8	8	0		0	12	8	0		**156**	
Pedestrians		0					20					0					4				**24**	
Bicycles	0	4	0	0		8	8	0	0		0	0	0	0		0	4	0	0		**24**	
Buses																						
Stopped Buses																						

LOCATION: SR 907/Alton Rd/N Bay Rd & 43rd St/Alton Rd
CITY/STATE: Miami Beach, FL

PROJECT ID: 22-140217-002
DATE: Thu, May 05, 2022

Peak-Hour: 05:00 PM - 06:00 PM
Peak 15-Minute: 05:45 PM - 06:00 PM





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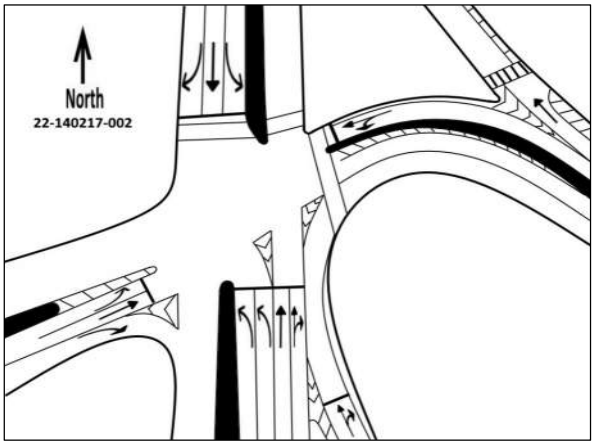


15-Min Count Period Beginning At	SR 907/Alton Rd/N Bay Rd Northbound					SR 907/Alton Rd/N Bay Rd Southbound					43rd St/Alton Rd Eastbound					43rd St/Alton Rd Westbound					Total	Hourly Total
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
04:00 PM	33	281	13	0		23	241	16	0		35	13	45	1		4	18	37	1		761	2826
04:15 PM	27	278	8	1		23	228	11	0		24	12	41	0		4	16	26	0		699	2744
04:30 PM	31	277	19	2		23	187	11	2		31	20	40	0		6	10	35	0		694	2716
04:45 PM	35	245	11	4		14	214	18	0		31	14	42	0		3	14	27	0		672	2710
05:00 PM	23	260	13	1		20	198	16	1		32	20	45	0		2	12	36	0		679	2851
05:15 PM	19	272	12	1		22	201	6	0		39	14	37	0		0	7	40	1		671	2172
05:30 PM	15	294	14	3		13	216	9	0		17	18	27	0		6	13	42	1		688	1501
05:45 PM	33	347	13	1		11	284	7	0		25	10	24	0		3	14	40	1		813	813
Peak 15-Min Flowrates	**Northbound**					**Southbound**					**Eastbound**					**Westbound**					**Total**	
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
All Vehicles	132	1388	56	12		88	1136	64	4		156	80	180	0		24	56	168	4		**3548**	
Heavy Trucks	4	12	4	0		8	28	4	0		4	16	8	0		0	12	4	0		**104**	
Pedestrians		0					20					4					0				**24**	
Bicycles	0	0	0	0		4	0	0	0		0	4	0	0		4	4	0	0		**16**	
Buses																						
Stopped Buses																						

Prepared by National Data & Surveying Services

VOLUME

I-195/Julia Tuttle Cswy On Ramp W/O Ed Sullivan Dr On-Ramp/W/O SR 907

Day: Thursday
Date: 5/5/2022

City: Miami Beach
Project #: FL22_140218_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	0	17,110	17,110

AM Period	NB	SB	EB	WB		TOTAL		PM Period	NB	SB	EB	WB		TOTAL	
00:00				47		47		12:00				238		238	
00:15				47		47		12:15				278		278	
00:30				74		74		12:30				248		248	
00:45				41	209	41	209	12:45				262	1026	262	1026
01:00				48		48		13:00				217		217	
01:15				41		41		13:15				265		265	
01:30				29		29		13:30				230		230	
01:45				29	147	29	147	13:45				282	994	282	994
02:00				38		38		14:00				331		331	
02:15				21		21		14:15				315		315	
02:30				9		9		14:30				314		314	
02:45				23	91	23	91	14:45				278	1238	278	1238
03:00				22		22		15:00				343		343	
03:15				15		15		15:15				392		392	
03:30				13		13		15:30				347		347	
03:45				18	68	18	68	15:45				266	1348	266	1348
04:00				20		20		16:00				274		274	
04:15				27		27		16:15				283		283	
04:30				28		28		16:30				270		270	
04:45				26	101	26	101	16:45				276	1103	276	1103
05:00				36		36		17:00				281		281	
05:15				40		40		17:15				260		260	
05:30				54		54		17:30				246		246	
05:45				55	185	55	185	17:45				269	1056	269	1056
06:00				93		93		18:00				281		281	
06:15				106		106		18:15				259		259	
06:30				162		162		18:30				218		218	
06:45				163	524	163	524	18:45				207	965	207	965
07:00				265		265		19:00				157		157	
07:15				302		302		19:15				244		244	
07:30				333		333		19:30				220		220	
07:45				376	1276	376	1276	19:45				297	918	297	918
08:00				343		343		20:00				161		161	
08:15				332		332		20:15				100		100	
08:30				214		214		20:30				153		153	
08:45				279	1168	279	1168	20:45				103	517	103	517
09:00				224		224		21:00				82		82	
09:15				253		253		21:15				72		72	
09:30				248		248		21:30				89		89	
09:45				276	1001	276	1001	21:45				75	318	75	318
10:00				266		266		22:00				86		86	
10:15				286		286		22:15				101		101	
10:30				223		223		22:30				73		73	
10:45				275	1050	275	1050	22:45				80	340	80	340
11:00				301		301		23:00				96		96	
11:15				257		257		23:15				116		116	
11:30				233		233		23:30				103		103	
11:45				290	1081	290	1081	23:45				71	386	71	386
TOTALS					6901		6901	TOTALS					10209		10209
SPLIT %					100.0%		40.3%	SPLIT %					100.0%		59.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	0	17,110	17,110

AM Peak Hour				07:30	07:30	PM Peak Hour				14:45	14:45
AM Pk Volume				1384	1384	PM Pk Volume				1360	1360
Pk Hr Factor				0.920	0.920	Pk Hr Factor				0.867	0.867
7 - 9 Volume	0	0	0	2444	2444	4 - 6 Volume	0	0	0	2159	2159
7 - 9 Peak Hour				07:30	07:30	4 - 6 Peak Hour				16:15	16:15
7 - 9 Pk Volume	0	0	0	1384	1384	4 - 6 Pk Volume	0	0	0	1110	1110
Pk Hr Factor	0.000	0.000	0.000	0.920	0.920	Pk Hr Factor	0.000	0.000	0.000	0.981	0.981

TOD Schedule Report

for 2650: Alton Rd&Art Godfrey Rd

Print Date: 10/4/2021

Print Time: 3:12 PM

Asset	Intersection	TOD Schedule	Op Mode	Plan #	Cycle	Offset	TOD Setting	Active PhaseBank	Active Maximum
2650	Alton Rd&Art Godfrey Rd	DOW-2	TOD	[07] NOON/LUNCH	120	97	N/A	1	Max 2

Splits

PH 1	PH 2	PH 3	PH 4	PH 5	PH 6	PH 7	PH 8
EBL	WBT	SBL	NBT	WBL	EBT	-	SBT
8	52	6	30	8	52	0	42

Active Phase Bank: Phase Bank 1

Phase	Walk Phase Bank 1	2	3	Don't Walk 1	2	3	Min Initial 1	2	3	Veh Ext 1	2	3	Max Limit 1	2	3	Max 2 1	2	3	Yellow	Red
1 EBL	0	0	0	0	0	0	5	5	5	2	2	2	6	6	10	22	15	15	3.7	2
2 WBT	5	5	5	37	14	14	7	7	7	1	1	1	30	32	40	0	26	0	4	2.3
3 SBL	0	0	0	0	0	0	5	5	5	2	2	2	6	6	10	10	6	5	3.7	2
4 NBT	4	4	4	33	26	26	7	7	7	2.5	2.5	2.5	15	16	20	22	16	16	4	2.3
5 WBL	0	0	0	0	0	0	5	5	5	2	2	2	6	6	10	20	6	10	3.7	2
6 EBT	5	5	5	37	14	14	7	7	7	1	1	1	30	32	40	0	26	0	4	2.3
7 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 SBT	4	4	4	33	26	26	7	7	7	2.5	2.5	2.5	15	16	20	22	16	16	4	2.3

Last In Service Date: unknown

Permitted Phases

	12345678
Default	123456-8
External Permit 0	123456-8
External Permit 1	-2-4-6-8
External Permit 2	-2-4-6-8

TOD Schedule Report

for 2650: Alton Rd&Art Godfrey Rd

Print Date: 10/4/2021

Print Time: 3:12 PM

Current TOD Schedule	Plan	Cycle	Green Time 1 EBL	2 WBT	3 SBL	4 NBT	5 WBL	6 EBT	7 -	8 SBT	Ring Offset	Offset
	1	180	21	99	6	29	7	113	0	42	0	109
	2	100	9	31	6	30	9	31	0	37	0	43
	3	120	6	54	6	28	7	53	0	42	0	110
	4	100	6	34	6	30	7	33	0	42	0	62
	5	120	8	52	6	30	8	52	0	42	0	86
	6	140	9	68	9	30	19	58	0	45	0	103
	7	120	8	52	6	30	8	52	0	42	0	97
	8	120	7	52	7	30	7	52	0	43	0	65
	9	140	9	68	9	30	19	58	0	45	0	103
	10	160	21	79	6	29	7	93	0	42	0	129
	11	100	6	34	6	29	7	33	0	42	0	62
	13	140	9	70	7	30	9	70	0	43	0	83
	18	160	14	83	9	30	14	83	0	45	0	90
	19	160	6	93	7	30	6	93	0	43	0	118
	23	160	9	74	8	45	9	74	0	59	0	118
	24	160	7	82	8	39	7	82	0	53	0	118
	25	180	6	114	6	29	27	93	0	42	0	129

Local TOD Schedule

Time	Plan	DOW
0000	Free	Su M T W Th F S
0200	Free	Su S
0600	13	M T W Th F
0700	4	Su S
0715	9	M T W Th F
0800	2	Su S
0915	5	M T W Th F
1100	5	S
1145	6	M T W Th F
1230	7	S
1230	5	Su
1345	7	M T W Th F
1430	19	W
1530	19	M T Th F
1800	9	Su S
1930	2	M T W Th F
2100	4	Su S
2300	Free	M T W Th F

Current Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	-------1	SuM T W ThF S
0000	TOD LOCAL MULTIFU	----4---	SuM T W ThF S
0100	TOD OUTPUTS	------2-	M T W ThF
0500	TOD LOCAL MULTIFU	--------	SuM T W ThF S
0630	TOD OUTPUTS	--------	M T W ThF
2330	TOD OUTPUTS	-------1	M T W Th

Local Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	-------1	SuM T W ThF S
0000	TOD LOCAL MULTIFUNCT	----4---	SuM T W ThF S
0100	TOD OUTPUTS	------2-	M T W ThF
0200	TOD OUTPUTS	------2-	Su S
0500	TOD LOCAL MULTIFUNCT	--------	SuM T W ThF S
0630	TOD OUTPUTS	--------	M T W ThF
0700	TOD OUTPUTS	--------	Su S
0800	TOD OUTPUTS	----4---	Su S
1800	TOD OUTPUTS	--------	Su S
2330	TOD OUTPUTS	-------1	M T W Th

* Settings

Blank - FREE - Phase Bank 1, Max 1
Blank - Plan - Phase Bank 1, Max 2
1 - Phase Bank 2, Max 1
2 - Phase Bank 2, Max 2
3 - Phase Bank 3, Max 1
4 - Phase Bank 3, Max 2
5 - EXTERNAL PERMIT 1
6 - EXTERNAL PERMIT 2
7 - X-PED OMIT
8 - TBA

No Calendar Defined/Enabled

TOD Schedule Report

for 2649: Alton Rd&Chase Av&N Bay Rd

Print Date: 10/4/2021

Print Time: 3:11 PM

Asset	Intersection	TOD Schedule	Op Mode	Plan #	Cycle	Offset	TOD Setting	Active PhaseBank	Active Maximum
2649	Alton Rd&Chase Av&N Bay Rd	DOW-2	TOD	[09] MID-AFT./AFTNOO	120	0	N/A	1	Max 2

Splits

PH 1	PH 2	PH 3	PH 4	PH 5	PH 6	PH 7	PH 8
-	NBT	-	EBT	-	SBT	-	WBT
0	73	0	34	0	73	0	34

Active Phase Bank: Phase Bank 1

Phase	Walk Phase Bank 1	Walk Phase Bank 2	Walk Phase Bank 3	Don't Walk Phase Bank 1	Don't Walk Phase Bank 2	Don't Walk Phase Bank 3	Min Initial Phase Bank 1	Min Initial Phase Bank 2	Min Initial Phase Bank 3	Veh Ext Phase Bank 1	Veh Ext Phase Bank 2	Veh Ext Phase Bank 3	Max Limit Phase Bank 1	Max Limit Phase Bank 2	Max Limit Phase Bank 3	Max 2 Phase Bank 1	Max 2 Phase Bank 2	Max 2 Phase Bank 3	Yellow	Red
1 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 NBT	7	7	7	20	20	20	7	7	7	1	1	1	35	35	35	0	35	35	4	2.4
3 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 EBT	0	0	0	0	0	0	7	7	7	2.5	2.5	2.5	12	12	15	34	12	25	4	2.8
5 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 SBT	7	7	7	20	20	20	7	7	7	1	1	1	35	35	35	0	35	35	4	2.4
7 -	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 WBT	4	4	4	29	29	29	7	7	7	2.5	2.5	2.5	12	12	15	34	12	25	4	2.8

Last In Service Date: unknown

Permitted Phases

	12345678
Default	-2-4-6-8
External Permit 0	-2-4-6-8
External Permit 1	-2-4-6-8
External Permit 2	-2-4-6-8

TOD Schedule Report

for 2649: Alton Rd&Chase Av&N Bay Rd

Print Date: 10/4/2021

Print Time: 3:11 PM

Current TOD Schedule	Plan	Cycle	Green Time 1 -	2 NBT	3 -	4 EBT	5 -	6 SBT	7 -	8 WBT	Ring Offset	Offset
	1	90	0	43	0	34	0	43	0	34	0	0
	2	90	0	43	0	34	0	43	0	34	0	0
	3	100	0	53	0	34	0	53	0	34	0	0
	4	90	0	43	0	34	0	43	0	34	0	0
	5	90	0	43	0	34	0	43	0	34	0	0
	6	90	0	43	0	34	0	43	0	34	0	0
	9	120	0	73	0	34	0	73	0	34	0	0
	10	90	0	43	0	34	0	43	0	34	0	0
	21	90	0	43	0	34	0	43	0	34	0	0
	26	180	0	133	0	34	0	133	0	34	0	0
	27	180	0	133	0	34	0	133	0	34	0	0

Local TOD Schedule

Time	Plan	DOW
0000	Free	Su M T W Th F S
0500	2	M T W Th F
0545	3	M T W Th F
0600	2	Su S
0630	9	M T W Th F
0800	9	Su S
1900	2	Su M T W Th F S

Current Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	--------	SuM T W ThF S
0000	PERMIT	--------	SuM T W ThF S
0000	PERMIT	--------	SuM T W ThF S
0000	TOD LOCAL MULTIFU	----4---	SuM T W ThF S
0500	TOD LOCAL MULTIFU	--------	SuM T W ThF S

Local Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	--------	SuM T W ThF S
0000	PERMIT	--------	SuM T W ThF S
0000	PERMIT	--------	SuM T W ThF S
0000	TOD LOCAL MULTIFUNCT	----4---	SuM T W ThF S
0500	TOD LOCAL MULTIFUNCT	--------	SuM T W ThF S
0600	PED RECALL	8-------	S
1700	PED RECALL	8-------	F
2030	PED RECALL	--------	S
2359	PED RECALL	--------	F

* Settings

Blank - FREE - Phase Bank 1, Max 1
Blank - Plan - Phase Bank 1, Max 2
1 - Phase Bank 2, Max 1
2 - Phase Bank 2, Max 2
3 - Phase Bank 3, Max 1
4 - Phase Bank 3, Max 2
5 - EXTERNAL PERMIT 1
6 - EXTERNAL PERMIT 2
7 - X-PED OMIT
8 - TBA

No Calendar Defined/Enabled

TOD Schedule Report
for 2652: Alton Rd&47 St

Print Date: 10/4/2021

Print Time: 3:12 PM

Asset	Intersection	TOD Schedule	Op Mode	Plan #	Cycle	Offset	TOD Setting	Active PhaseBank	Active Maximum
2652	Alton Rd&47 St	DOW-2	TOD	[05] POST-AM PEAK	120	0	N/A	1	Max 2

Splits

PH 1	PH 2	PH 3	PH 4	PH 5	PH 6	PH 7	PH 8
SBL	NBT	-	EBT	-	SBT	-	WBT
8	74	0	19	0	88	0	19

Active Phase Bank: Phase Bank 1

Phase	Walk (Phase Bank 1 - 2 - 3)	Don't Walk (1 - 2 - 3)	Min Initial (1 - 2 - 3)	Veh Ext (1 - 2 - 3)	Max Limit (1 - 2 - 3)	Max 2 (1 - 2 - 3)	Yellow	Red
1 SBL	0 - 0 - 0	0 - 0 - 0	5 - 5 - 5	2 - 2 - 2	7 - 7 - 7	15 - 8 - 8	3.7	2
2 NBT	7 - 7 - 7	16 - 16 - 16	7 - 7 - 7	1 - 1 - 1	60 - 40 - 40	0 - 40 - 40	4	2
3 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
4 EBT	5 - 5 - 5	30 - 30 - 30	7 - 7 - 7	2.5 - 2.5 - 2.5	12 - 12 - 10	16 - 12 - 12	4	2.8
5 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
6 SBT	7 - 7 - 7	16 - 16 - 16	7 - 7 - 7	1 - 1 - 1	60 - 40 - 40	0 - 40 - 40	4	2
7 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
8 WBT	5 - 5 - 5	30 - 30 - 30	7 - 7 - 7	2.5 - 2.5 - 2.5	12 - 12 - 10	16 - 12 - 12	4	2.8

Last In Service Date: unknown

Permitted Phases

	12345678
Default	12-4-6-8
External Permit 0	-2-4-6-8
External Permit 1	-2-4-6-8
External Permit 2	-2-4-6-8

Current TOD Schedule	Plan	Cycle	Green Time 1 SBL	2 NBT	3 -	4 EBT	5 -	6 SBT	7 -	8 WBT	Ring Offset	Offset
	1	90	8	44	0	19	0	58	0	19	0	0
	2	120	8	74	0	19	0	88	0	19	0	0
	3	90	8	44	0	19	0	58	0	19	0	0
	4	90	8	44	0	19	0	58	0	19	0	0
	5	120	8	74	0	19	0	88	0	19	0	0
	6	90	8	44	0	19	0	58	0	19	0	0
	7	90	8	44	0	19	0	58	0	19	0	0
	8	90	8	44	0	19	0	58	0	19	0	0
	9	90	8	44	0	19	0	58	0	19	0	0
	10	90	8	44	0	19	0	58	0	19	0	0

Local TOD Schedule

Time	Plan	DOW
0000	Free	Su M T W Th F S
0600	3	M T W Th F
0800	5	M T W Th F
1000	4	Su S
1515	2	M T W Th F
1600	7	Su S
1830	4	Su S
2000	8	Su M T W Th F S
2330	Free	M T W

TOD Schedule Report
for 2652: Alton Rd&47 St

Print Date: 10/4/2021

Print Time: 3:12 PM

Current Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	--------	SuM T W ThF S
0000	TOD LOCAL MULTIFU	----4---	SuM T W ThF S
0500	TOD LOCAL MULTIFU	--------	SuM T W ThF S
0500	TOD OUTPUTS	-------1	M T W ThF
0700	TOD OUTPUTS	--------	M T W ThF
1000	TOD OUTPUTS	-----3--	M T W ThF
1400	TOD OUTPUTS	--------	M T W ThF

Local Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	--------	SuM T W ThF S
0000	TOD LOCAL MULTIFUNCT	----4---	SuM T W ThF S
0500	TOD LOCAL MULTIFUNCT	--------	SuM T W ThF S
0500	TOD OUTPUTS	-------1	M T W ThF
0600	TOD OUTPUTS	-----3--	Su S
0700	TOD OUTPUTS	--------	M T W ThF
0900	TOD OUTPUTS	-------1	Su S
1000	TOD OUTPUTS	-----3--	M T W ThF
1400	TOD OUTPUTS	--------	M T W ThF
2200	TOD OUTPUTS	-----3--	Su S

* Settings

Blank - FREE - Phase Bank 1, Max 1
Blank - Plan - Phase Bank 1, Max 2
1 - Phase Bank 2, Max 1
2 - Phase Bank 2, Max 2
3 - Phase Bank 3, Max 1
4 - Phase Bank 3, Max 2
5 - EXTERNAL PERMIT 1
6 - EXTERNAL PERMIT 2
7 - X-PED OMIT
8 - TBA

No Calendar Defined/Enabled

TOD Schedule Report

for 2651: Alton Rd&Sullivan Dr&43 St

Print Date: 10/13/2021

Print Time: 2:01 AM

Asset	Intersection	TOD Schedule	Op Mode	Plan #	Cycle	Offset	TOD Setting	Active PhaseBank	Active Maximum
2651	Alton Rd&Sullivan Dr&43 St	DOW-4	TOD	N/A	0	0	N/A	0	Max 0

Splits

PH 1	PH 2	PH 3	PH 4	PH 5	PH 6	PH 7	PH 8
SBL	NBT	-	-	NBL	SBT	EBT	WBT
0	0	0	0	0	0	0	0

Active Phase Bank: Phase Bank 1

Phase	Walk Phase Bank 1 2 3	Don't Walk 1 2 3	Min Initial 1 2 3	Veh Ext 1 2 3	Max Limit 1 2 3	Max 2 1 2 3	Yellow	Red
1 SBL	0 - 0 - 0	0 - 0 - 0	5 - 5 - 5	2 - 2 - 2	5 - 12 - 8	12 - 12 - 12	3.7	2
2 NBT	7 - 7 - 7	21 - 21 - 21	7 - 7 - 7	1 - 1 - 1	30 - 80 - 50	61 - 82 - 46	4	3.3
3 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
4 -	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0 - 0 - 0	0	0
5 NBL	0 - 0 - 0	0 - 0 - 0	5 - 5 - 5	5 - 5 - 5	10 - 35 - 37	37 - 37 - 37	3.7	2
6 SBT	0 - 7 - 7	0 - 21 - 21	7 - 7 - 7	1 - 1 - 1	30 - 80 - 50	61 - 82 - 46	4	3.3
7 EBT	0 - 0 - 0	0 - 0 - 0	7 - 7 - 7	2.5 - 2.5 - 2.5	7 - 15 - 18	15 - 18 - 20	4	2.3
8 WBT	7 - 7 - 7	21 - 21 - 21	7 - 7 - 7	3.5 - 3.5 - 3.5	7 - 20 - 25	28 - 25 - 28	4	2.3

Last In Service Date: unknown

Permitted Phases

	12345678
Default	12--5678
External Permit 0	-2--5678
External Permit 1	-2--5678
External Permit 2	-2--5678

Current TOD Schedule	Plan	Cycle	Green Time 1 SBL	2 NBT	3 -	4 -	5 NBL	6 SBT	7 EBT	8 WBT	Ring Offset	Offset
	5	145	7	67	0	0	18	56	18	28	0	0
	6	140	8	55	0	0	18	45	23	29	0	0
	10	145	7	65	0	0	17	55	20	28	0	0
	12	155	11	101	0	0	24	88	8	10	0	0
	13	155	11	101	0	0	24	88	8	10	0	0

Local TOD Schedule

Time	Plan	DOW
0000	Free	Su M T W Th F S

TOD Schedule Report

for 2651: Alton Rd&Sullivan Dr&43 St

Print Date: 10/13/2021

Print Time: 2:01 AM

Current Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	--------	SuM T W ThF S
0000	TOD LOCAL MULTIFU	----4---	SuM T W ThF S
0500	TOD LOCAL MULTIFU	--------	SuM T W ThF S
0545	TOD OUTPUTS	-----3--	M T W ThF
0730	TOD OUTPUTS	-------1	M T W ThF
0800	TOD OUTPUTS	------2-	M T W ThF
1000	TOD OUTPUTS	-------1	M T W ThF
1145	TOD OUTPUTS	-----3--	M T W ThF
1600	TOD OUTPUTS	----4---	SuM T W ThF S
1900	TOD OUTPUTS	--------	SuM T W ThF S

Local Time of Day Function

Time	Function	Settings *	Day of Week
0000	TOD OUTPUTS	--------	SuM T W ThF S
0000	TOD LOCAL MULTIFUNCT	----4---	SuM T W ThF S
0500	TOD LOCAL MULTIFUNCT	--------	SuM T W ThF S
0545	TOD OUTPUTS	-----3--	M T W ThF
0630	TOD OUTPUTS	----4---	Su S
0730	TOD OUTPUTS	-------1	M T W ThF
0800	TOD OUTPUTS	------2-	M T W ThF
1000	TOD OUTPUTS	-------1	M T W ThF
1145	TOD OUTPUTS	-----3--	M T W ThF
1600	TOD OUTPUTS	----4---	SuM T W ThF S
1900	TOD OUTPUTS	--------	SuM T W ThF S

* Settings

Blank - FREE - Phase Bank 1, Max 1
Blank - Plan - Phase Bank 1, Max 2
1 - Phase Bank 2, Max 1
2 - Phase Bank 2, Max 2
3 - Phase Bank 3, Max 1
4 - Phase Bank 3, Max 2
5 - EXTERNAL PERMIT 1
6 - EXTERNAL PERMIT 2
7 - X-PED OMIT
8 - TBA

No Calendar Defined/Enabled

COVID ADJUSTMENT FACTOR CALULATION
MSMC CANCER CENTER

Description / Roadway	AM Covid Factor	PM Covid Factor
WB On-Ramp to I-195	0.90	0.76
Average	**0.90**	**0.76**

Description / Roadway	Ramp to WB-195
03/04/2020 AM Peak-Hour Counts *	1216
03/05/2020 AM Peak-Hour Counts *	1204
Average 2022 AM Peak-Hour Counts*	1210
2022 Synopsis Data (Growth 1.37%)	1243
2022 AM Peak-Hour Counts **	1384
AM Adjustment Factor	0.90
Average AM Adjustment Factor	**0.90**
03/04/2020 PM Peak-Hour Counts *	1051
03/05/2020 PM Peak-Hour Counts *	964
Average 2022 PM Peak-Hour Counts*	1008
2022 Synopsis Data (Growth 1.37%)	1035
2022 PM Peak-Hour Counts **	1360
PM Adjustment Factor	0.76
Average PM Adjustment Factor	**0.76**

**2019 data based on WB FDOT count station 6031 on the WB On-Ramp to I-195.*

**2022 data based on WB count data on the WB On-Ramp to I-195.*

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

County: 87
Station: 6031
Description: RAMP 87004025 FROM SB ALTON RD TO WB I-195, 200' S
Start Date: 03/04/2020
Start Time: 0000

Direction: W

Time	1st	2nd	3rd	4th	Total
0000	51	49	31	21	152
0100	20	18	14	12	64
0200	14	13	11	12	50
0300	6	16	17	17	56
0400	17	25	25	26	93
0500	35	51	77	78	241
0600	112	141	172	203	628
0700	242	252	304	263	1061
0800	323	325	299	269	1216
0900	270	235	250	256	1011
1000	214	247	267	222	950
1100	223	256	212	239	930
1200	224	246	213	222	905
1300	213	222	175	221	831
1400	241	219	221	250	931
1500	210	21	39	81	351
1600	84	37	17	61	199
1700	96	279	265	244	884
1800	263	248	239	207	957
1900	190	203	250	216	859
2000	166	152	142	99	559
2100	105	88	123	94	410
2200	106	100	97	90	393
2300	107	91	98	52	348

24-Hour Totals: 14079

Peak Volume Information

	Hour	Volume
A.M.	800	1216
P.M.	1715	1051
Daily	800	1216

Truck Percentage 2.42 NaN 2.42

Classification Summary Database

Dir	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TotTrk	TotVol
W	58	12816	864	37	203	52	10	14	20	3	2	0	0	0	0	341	14079

Generated by SPS 5.0.53P
County: 87
Station: 6031
Description: RAMP 87004025 FROM SB ALTON RD TO WB I-195, 200' S
Start Date: 03/05/2020
Start Time: 0000

Direction: W

Time	1st	2nd	3rd	4th	Total
0000	45	39	36	37	157
0100	12	18	6	20	56
0200	16	13	8	11	48
0300	5	10	18	20	53
0400	15	33	30	35	113
0500	39	58	75	79	251
0600	89	156	183	218	646
0700	245	244	319	286	1094
0800	327	272	259	227	1085
0900	252	254	253	233	992
1000	255	228	195	235	913
1100	221	218	225	223	887
1200	224	185	244	210	863
1300	193	227	199	217	836
1400	229	222	226	210	887
1500	261	242	251	209	963
1600	82	78	6	59	225
1700	97	83	106	89	375
1800	194	220	212	202	828
1900	179	211	265	196	851
2000	143	176	153	131	603
2100	116	113	115	114	458
2200	132	96	78	70	376
2300	102	103	106	61	372

24-Hour Totals: 13932

Peak Volume Information

	Hour	Volume
A.M.	730	1204
P.M.	1445	964
Daily	730	1204

Truck Percentage 2.62 NaN 2.62

Classification Summary Database

Dir	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TotTrk	TotVol
W	22	12661	884	52	195	47	15	16	27	10	3	0	0	0	0	365	13932

2019 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
CATEGORY: 8700 MIAMI-DADE NORTH

MOCF: 0.97

WEEK	DATES	SF	PSCF
1	01/01/2019 - 01/05/2019	1.03	1.06
2	01/06/2019 - 01/12/2019	1.02	1.05
3	01/13/2019 - 01/19/2019	1.01	1.04
4	01/20/2019 - 01/26/2019	1.00	1.03
* 5	01/27/2019 - 02/02/2019	0.98	1.01
* 6	02/03/2019 - 02/09/2019	0.97	1.00
* 7	02/10/2019 - 02/16/2019	0.96	0.99
* 8	02/17/2019 - 02/23/2019	0.96	0.99
* 9	02/24/2019 - 03/02/2019	0.96	0.99
*10	03/03/2019 - 03/09/2019	0.96	0.99
*11	03/10/2019 - 03/16/2019	0.97	1.00
*12	03/17/2019 - 03/23/2019	0.97	1.00
*13	03/24/2019 - 03/30/2019	0.97	1.00
*14	03/31/2019 - 04/06/2019	0.97	1.00
*15	04/07/2019 - 04/13/2019	0.98	1.01
*16	04/14/2019 - 04/20/2019	0.98	1.01
*17	04/21/2019 - 04/27/2019	0.98	1.01
18	04/28/2019 - 05/04/2019	0.99	1.02
19	05/05/2019 - 05/11/2019	0.99	1.02
20	05/12/2019 - 05/18/2019	1.00	1.03
21	05/19/2019 - 05/25/2019	1.00	1.03
22	05/26/2019 - 06/01/2019	1.01	1.04
23	06/02/2019 - 06/08/2019	1.01	1.04
24	06/09/2019 - 06/15/2019	1.02	1.05
25	06/16/2019 - 06/22/2019	1.02	1.05
26	06/23/2019 - 06/29/2019	1.02	1.05
27	06/30/2019 - 07/06/2019	1.02	1.05
28	07/07/2019 - 07/13/2019	1.03	1.06
29	07/14/2019 - 07/20/2019	1.03	1.06
30	07/21/2019 - 07/27/2019	1.03	1.06
31	07/28/2019 - 08/03/2019	1.02	1.05
32	08/04/2019 - 08/10/2019	1.02	1.05
33	08/11/2019 - 08/17/2019	1.02	1.05
34	08/18/2019 - 08/24/2019	1.02	1.05
35	08/25/2019 - 08/31/2019	1.02	1.05
36	09/01/2019 - 09/07/2019	1.03	1.06
37	09/08/2019 - 09/14/2019	1.03	1.06
38	09/15/2019 - 09/21/2019	1.03	1.06
39	09/22/2019 - 09/28/2019	1.02	1.05
40	09/29/2019 - 10/05/2019	1.01	1.04
41	10/06/2019 - 10/12/2019	1.00	1.03
42	10/13/2019 - 10/19/2019	0.99	1.02
43	10/20/2019 - 10/26/2019	1.00	1.03
44	10/27/2019 - 11/02/2019	1.00	1.03
45	11/03/2019 - 11/09/2019	1.01	1.04
46	11/10/2019 - 11/16/2019	1.01	1.04
47	11/17/2019 - 11/23/2019	1.02	1.05
48	11/24/2019 - 11/30/2019	1.02	1.05
49	12/01/2019 - 12/07/2019	1.02	1.05
50	12/08/2019 - 12/14/2019	1.03	1.06
51	12/15/2019 - 12/21/2019	1.03	1.06
52	12/22/2019 - 12/28/2019	1.02	1.05
53	12/29/2019 - 12/31/2019	1.01	1.04

* PEAK SEASON

GROWTH RATE CALCULATION
MSMC CANCER CENTER

Roadway	FDOT Site	5 Year Linear Trend
SR 907 ALTON ROAD -- 200' N OF NAUTILUS DR	2647	3.03%
SR 112/ARTHUR GODFREY RD -- 200' W INDIAN CREEK DR	5388	1.60%
SR 907/ALTON RD -- 200' N OF 20 ST	0012	-0.53%
Average Annual Growth Rate		**1.37%**

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2020 HISTORICAL AADT REPORT

COUNTY: 87 - MIAMI-DADE

SITE: 0012 - SR 907/ALTON RD, 200' N OF 20 ST (MIAMI BEACH)

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2020	36500 C	N 17000	S 19500	9.00	54.20	2.70
2019	43000 C	N 23000	S 20000	9.00	54.60	3.40
2018	49500 C	N 24500	S 25000	9.00	54.30	4.80
2017	47000 C	N 22500	S 24500	9.00	55.00	3.00
2016	46000 C	N 22500	S 23500	9.00	54.50	3.70
2015	46000 C	N 22500	S 23500	9.00	54.70	3.20
2014	47500 S	N 22000	S 25500	9.00	54.50	2.50
2013	47500 F	N 22000	S 25500	9.00	52.40	2.50
2012	48500 C	N 22500	S 26000	9.00	55.70	2.50
2011	47000 C	N 22500	S 24500	9.00	55.10	3.50
2010	46000 C	N 23000	S 23000	8.98	54.08	3.50
2009	47000 C	N 23500	S 23500	8.99	53.24	3.90
2008	46500 C	N 23000	S 23500	9.09	55.75	2.10
2007	47500 C	N 23000	S 24500	8.01	54.34	2.20
2006	46500 C	N 23000	S 23500	7.97	54.22	3.00
2005	46500 F	N 22500	S 24000	8.80	53.80	5.30

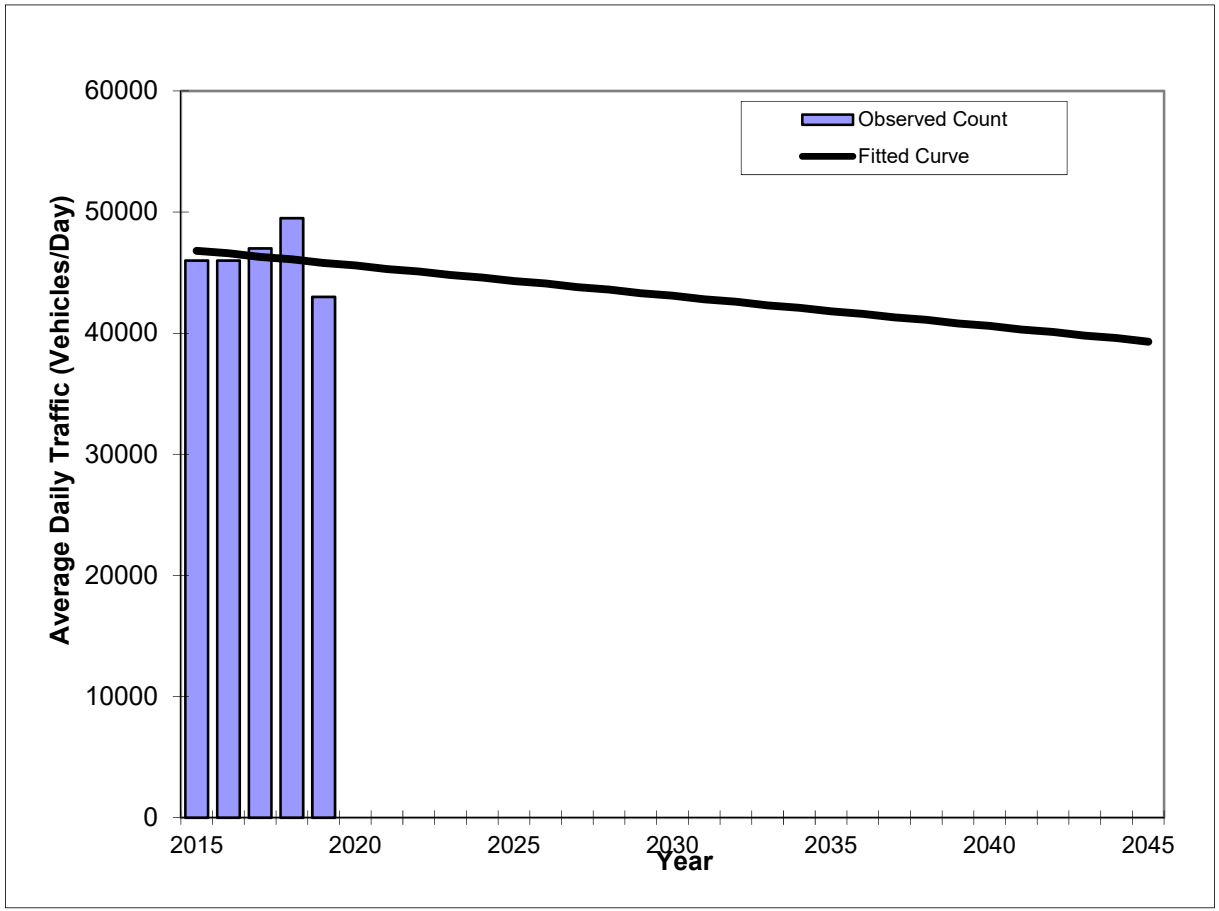
AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

Traffic Trends - V3.0

SR 907/ALTON RD -- 200' N OF 20 ST

FIN#	0
Location	1

County:	Miami-Dade (87)
Station #:	0012
Highway:	SR 907/ALTON RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	46000	46800
2016	46000	46600
2017	47000	46300
2018	49500	46100
2019	43000	45800
2025 Opening Year Trend		
2025	N/A	44300
2035 Mid-Year Trend		
2035	N/A	41800
2045 Design Year Trend		
2045	N/A	39300
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	-250
Trend R-squared:	2.87%
Trend Annual Historic Growth Rate:	-0.53%
Trend Growth Rate (2019 to Design Year):	-0.55%
Printed:	18-Apr-22

Straight Line Growth Option

***Axle-Adjusted**

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2020 HISTORICAL AADT REPORT

COUNTY: 87 - MIAMI-DADE

SITE: 2647 - SR 907 ALTON ROAD 200' N OF NAUTILUS DR

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2020	4500 C	N 3100	S 1400	9.00	54.20	3.90
2019	8200 C	N 5800	S 2400	9.00	54.60	2.80
2018	6400 C	N 4200	S 2200	9.00	54.30	3.00
2017	6300 C	N 4300	S 2000	9.00	55.00	2.60
2016	7200 C	N 4800	S 2400	9.00	54.50	4.20
2015	6800 C	N 4600	S 2200	9.00	54.70	2.50
2014	7000 C	N 4600	S 2400	9.00	54.50	3.70
2013	5600 C	N 3600	S 2000	9.00	52.40	5.00
2012	6800 C	N 4600	S 2200	9.00	55.70	6.60
2011	6500 C	N 4400	S 2100	9.00	55.10	4.90
2010	6300 C	N 4100	S 2200	8.98	54.08	1.90
2009	6800 C	N 4600	S 2200	8.99	53.24	4.30
2008	5900 C	N 3800	S 2100	9.09	55.75	4.20
2007	6400 C	N 4100	S 2300	8.01	54.34	4.00
2006	6400 C	N 4000	S 2400	7.97	54.22	2.10
2005	6500 C	N 4400	S 2100	8.80	53.80	0.00

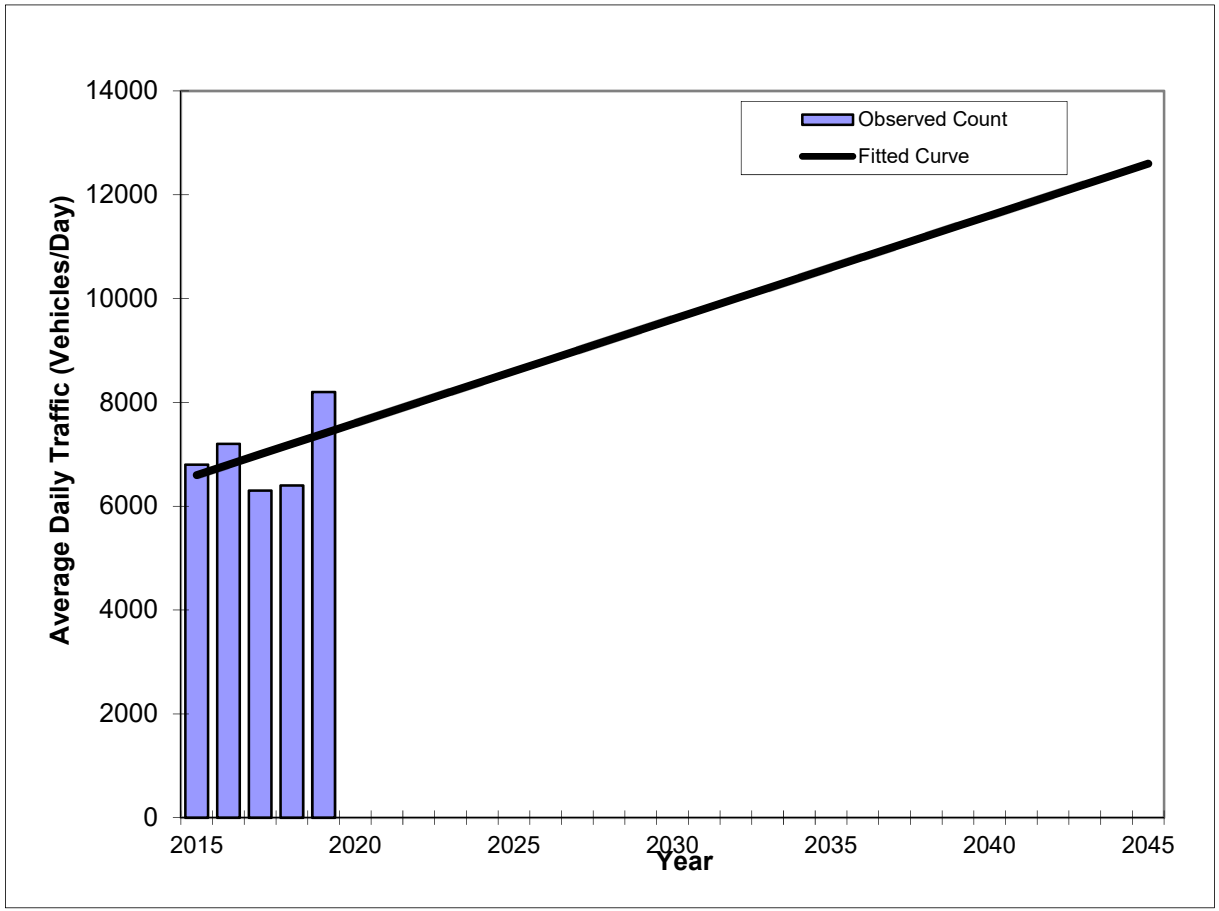
AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

Traffic Trends - V3.0

SR 907 ALTON ROAD -- 200' N OF NAUTILUS DR

FIN#	0
Location	1

County:	Miami-Dade (87)
Station #:	2647
Highway:	SR 907 ALTON ROAD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	6800	6600
2016	7200	6800
2017	6300	7000
2018	6400	7200
2019	8200	7400
2025 Opening Year Trend		
2025	N/A	8600
2035 Mid-Year Trend		
2035	N/A	10600
2045 Design Year Trend		
2045	N/A	12600
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	200
Trend R-squared:	16.89%
Trend Annual Historic Growth Rate:	3.03%
Trend Growth Rate (2019 to Design Year):	2.70%
Printed:	18-Apr-22

Straight Line Growth Option

***Axle-Adjusted**

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2020 HISTORICAL AADT REPORT

COUNTY: 87 - MIAMI-DADE

SITE: 5388 - SR 112/ARTHUR GODFREY RD, 200' W INDIAN CREEK DR

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2020	41000 F	E 19500	W 21500	9.00	54.20	4.80
2019	43000 C	E 20500	W 22500	9.00	54.60	3.80
2018	34000 C	E 16500	W 17500	9.00	54.30	4.50
2017	41000 C	E 18000	W 23000	9.00	55.00	4.00
2016	36000 C	E 18500	W 17500	9.00	54.50	3.30
2015	39000 C	E 19000	W 20000	9.00	54.70	4.40
2014	34000 C	E 17000	W 17000	9.00	54.50	4.40
2013	41000 C	E 20500	W 20500	9.00	52.40	5.20
2012	42500 C	E 23000	W 19500	9.00	55.70	4.90
2011	44000 C	E 23000	W 21000	9.00	55.10	5.00
2010	38500 C	E 20500	W 18000	8.98	54.08	6.20
2009	37500 C	E 19000	W 18500	8.99	53.24	6.00
2008	36500 C	E 19000	W 17500	9.09	55.75	5.90
2007	39000 C	E 22000	W 17000	8.36	54.73	5.70
2006	36500 C	E 21000	W 15500	8.70	56.15	13.70
2005	32000 C	E 17000	W 15000	8.50	53.00	5.50

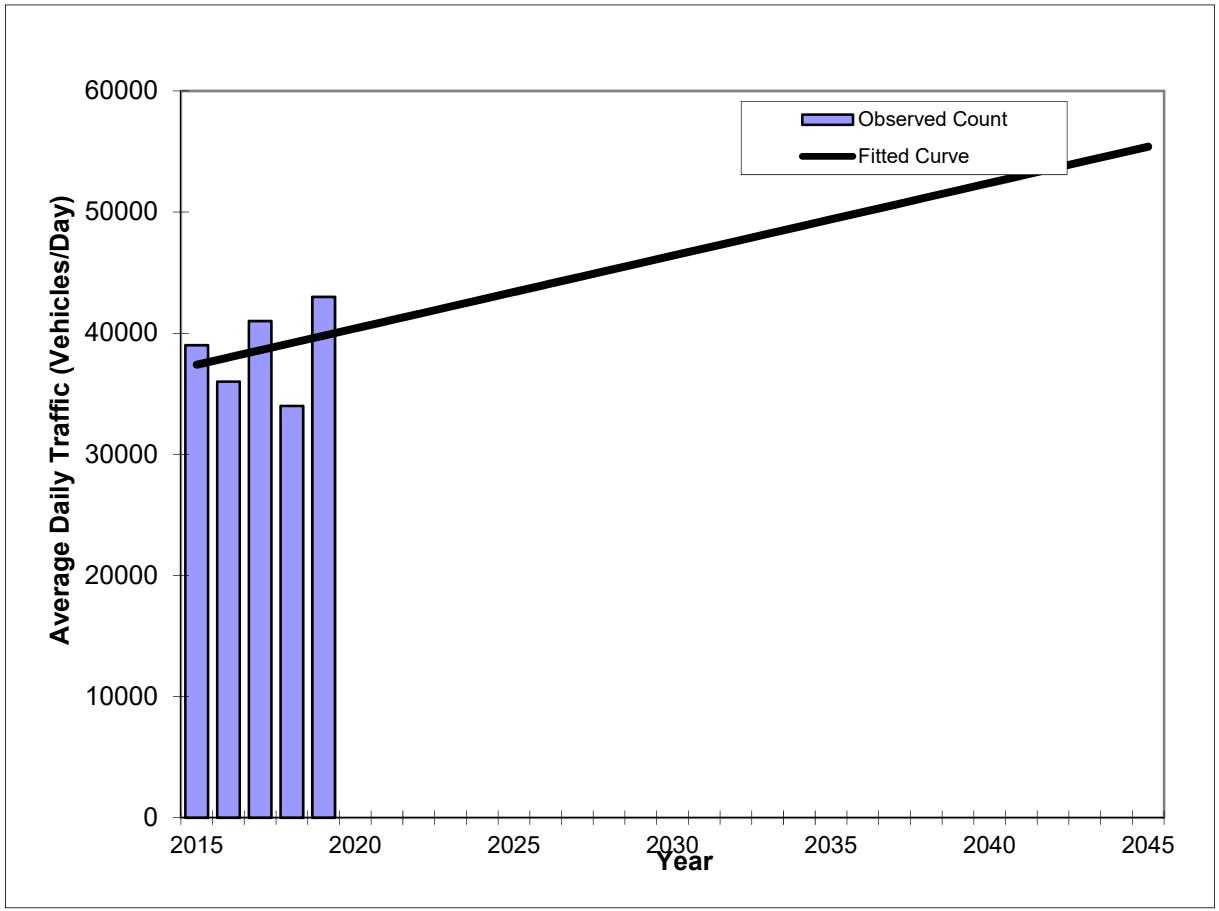
AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

Traffic Trends - V3.0

SR 112/ARTHUR GODFREY RD -- 200' W INDIAN CREEK DR

FIN#	0
Location	1

County:	Miami-Dade (87)
Station #:	5388
Highway:	SR 112/ARTHUR GODFREY RD



Year	Traffic (ADT/AADT) Count*	Trend**
2015	39000	37400
2016	36000	38000
2017	41000	38600
2018	34000	39200
2019	43000	39800
2025 Opening Year Trend		
2025	N/A	43400
2035 Mid-Year Trend		
2035	N/A	49400
2045 Design Year Trend		
2045	N/A	55400
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	600
Trend R-squared:	6.77%
Trend Annual Historic Growth Rate:	1.60%
Trend Growth Rate (2019 to Design Year):	1.51%
Printed:	18-Apr-22

Straight Line Growth Option

***Axle-Adjusted**

Traffic Analysis Zones 2010

Miami-Dade 2015 Base Year Direction Trip Distribution Summary											
TAZ of Origin		Trips / Percent	Cardinal Directions								Total Trips
County TAZ	Regional TAZ		NNE	ENE	ESE	SSE	SSW	WSW	WNW	NNW	
625	3525	Trips	610	160	-	557	431	1,317	679	1,035	4,961
625	3525	Percent	12.7	3.3	-	11.6	9.0	27.5	14.2	21.6	
626	3526	Trips	122	-	-	-	2,090	2,277	1,198	2,942	9,399
626	3526	Percent	1.4	-	-	-	24.2	26.4	13.9	34.1	
627	3527	Trips	279	-	-	-	2,051	2,578	845	1,965	8,061
627	3527	Percent	3.6	-	-	-	26.6	33.4	11.0	25.5	
628	3528	Trips	298	-	49	79	984	902	332	679	3,579
628	3528	Percent	9.0	-	1.5	2.4	29.6	27.2	10.0	20.5	
629	3529	Trips	1,374	549	344	1,656	1,708	3,707	1,668	2,101	14,261
629	3529	Percent	10.5	4.2	2.6	12.6	13.0	28.3	12.7	16.0	
630	3530	Trips	952	-	210	347	1,696	2,375	794	1,114	8,135
630	3530	Percent	12.7	-	2.8	4.6	22.7	31.7	10.6	14.9	
631	3531	Trips	255	-	-	-	1,215	1,471	440	1,030	4,651
631	3531	Percent	5.8	-	-	-	27.6	33.4	10.0	23.4	
632	3532	Trips	309	-	-	-	1,242	1,751	750	635	4,880
632	3532	Percent	6.6	-	-	-	26.5	37.4	16.0	13.5	
633	3533	Trips	310	-	-	-	1,181	1,428	750	730	4,590
633	3533	Percent	7.0	-	-	-	26.9	32.5	17.1	16.6	
634	3534	Trips	1,502	112	240	837	1,718	1,928	976	1,727	9,998
634	3534	Percent	16.6	1.2	2.7	9.3	19.0	21.3	10.8	19.1	
635	3535	Trips	779	-	-	-	2,021	1,994	952	1,411	8,010
635	3535	Percent	10.9	-	-	-	28.2	27.9	13.3	19.7	
636	3536	Trips	1,041	-	-	686	1,152	2,072	911	1,071	7,384
636	3536	Percent	15.0	-	-	9.9	16.6	29.9	13.1	15.4	
637	3537	Trips	323	31	87	217	126	601	303	290	1,987
637	3537	Percent	16.4	1.6	4.4	11.0	6.4	30.4	15.3	14.7	
638	3538	Trips	152	35	87	86	114	218	162	126	999
638	3538	Percent	15.5	3.6	8.9	8.7	11.6	22.3	16.5	12.9	
639	3539	Trips	825	281	277	1,089	131	1,364	796	599	5,721
639	3539	Percent	15.4	5.2	5.2	20.3	2.4	25.4	14.9	11.2	
640	3540	Trips	344	247	868	104	43	685	405	274	3,053
640	3540	Percent	11.6	8.3	29.2	3.5	1.5	23.1	13.6	9.2	
641	3541	Trips	1,051	1,714	291	723	309	1,572	1,188	916	8,356
641	3541	Percent	13.5	22.1	3.7	9.3	4.0	20.3	15.3	11.8	
642	3542	Trips	1,849	1,404	115	1,263	457	2,697	1,962	1,518	12,299
642	3542	Percent	16.4	12.5	1.0	11.2	4.1	23.9	17.4	13.5	
643	3543	Trips	1,747	551	-	965	479	2,595	1,554	1,715	10,383
643	3543	Percent	18.2	5.7	-	10.1	5.0	27.0	16.2	17.9	
644	3544	Trips	2,022	-	-	-	2,250	4,141	2,585	2,646	15,224
644	3544	Percent	14.8	-	-	-	16.5	30.4	19.0	19.4	
645	3545	Trips	1,268	-	-	-	907	1,498	1,720	1,351	7,018
645	3545	Percent	18.8	-	-	-	13.5	22.2	25.5	20.0	
646	3546	Trips	986	-	156	520	250	1,081	1,094	1,181	5,470
646	3546	Percent	18.7	-	3.0	9.9	4.7	20.5	20.8	22.4	
647	3547	Trips	350	103	114	165	66	354	359	408	1,979
647	3547	Percent	18.2	5.4	5.9	8.6	3.5	18.5	18.7	21.2	
648	3548	Trips	1,027	434	254	401	48	903	1,001	514	4,747
648	3548	Percent	22.4	9.5	5.5	8.8	1.0	19.7	21.9	11.2	
649	3549	Trips	754	192	184	230	41	612	743	427	3,320
649	3549	Percent	23.7	6.0	5.8	7.2	1.3	19.2	23.3	13.4	
650	3550	Trips	45	80	104	0	14	155	304	133	850
650	3550	Percent	5.4	9.6	12.4	0.0	1.6	18.5	36.5	16.0	

Miami-Dade 2045 Cost Feasible Plan Direction Trip Distribution Summary											
TAZ of Origin		Trips / Percent	Cardinal Directions								Total Trips
County TAZ	Regional TAZ		NNE	ENE	ESE	SSE	SSW	WSW	WNW	NNW	
625	3525	Trips	515	114	-	541	802	1,791	829	1,096	5,972
625	3525	Percent	9.1	2.0	-	9.5	14.1	31.5	14.6	19.3	
626	3526	Trips	66	-	-	-	2,417	3,260	1,417	2,993	11,237
626	3526	Percent	0.7	-	-	-	23.8	32.1	14.0	29.5	
627	3527	Trips	174	-	-	-	2,276	3,212	1,138	1,885	9,055
627	3527	Percent	2.0	-	-	-	26.2	37.0	13.1	21.7	
628	3528	Trips	238	-	23	101	1,053	1,266	390	660	4,028
628	3528	Percent	6.4	-	0.6	2.7	28.2	33.9	10.5	17.7	
629	3529	Trips	1,686	621	373	1,692	1,801	6,032	2,362	2,490	18,425
629	3529	Percent	9.9	3.6	2.2	9.9	10.6	35.4	13.9	14.6	
630	3530	Trips	888	-	326	303	1,717	3,876	1,515	1,553	11,277
630	3530	Percent	8.7	-	3.2	3.0	16.9	38.1	14.9	15.3	
631	3531	Trips	296	-	-	-	1,351	2,360	838	1,324	6,591
631	3531	Percent	4.8	-	-	-	21.9	38.3	13.6	21.5	
632	3532	Trips	343	-	-	-	1,500	2,647	1,390	1,098	7,499
632	3532	Percent	4.9	-	-	-	21.5	37.9	19.9	15.7	
633	3533	Trips	368	-	-	-	1,052	1,986	859	841	5,391
633	3533	Percent	7.2	-	-	-	20.6	38.9	16.8	16.5	
634	3534	Trips	1,404	80	149	773	1,637	2,733	1,332	1,712	10,593
634	3534	Percent	14.3	0.8	1.5	7.9	16.7	27.8	13.6	17.4	
635	3535	Trips	566	-	-	-	1,311	2,266	1,228	1,254	7,246
635	3535	Percent	8.5	-	-	-	19.8	34.2	18.5	18.9	
636	3536	Trips	1,066	-	-	607	978	3,045	1,398	1,193	8,805
636	3536	Percent	12.9	-	-	7.3	11.8	36.8	16.9	14.4	
637	3537	Trips	468	44	144	315	198	868	501	309	2,865
637	3537	Percent	16.5	1.6	5.1	11.1	6.9	30.5	17.6	10.9	
638	3538	Trips	127	33	78	94	79	401	285	185	1,342
638	3538	Percent	9.9	2.6	6.1	7.3	6.2	31.3	22.2	14.5	
639	3539	Trips	944	303	253	1,068	176	2,395	1,085	905	7,569
639	3539	Percent	13.2	4.3	3.6	15.0	2.5	33.6	15.2	12.7	
640	3540	Trips	119	74	216	10	30	177	136	147	1,166
640	3540	Percent	13.1	8.2	23.7	1.1	3.4	19.4	14.9	16.2	
641	3541	Trips	1,145	1,056	206	569	242	2,378	1,724	1,142	9,066
641	3541	Percent	13.5	12.5	2.4	6.7	2.9	28.1	20.4	13.5	
642	3542	Trips	1,701	1,196	113	964	433	3,470	2,140	1,631	12,324
642	3542	Percent	14.6	10.3	1.0	8.3	3.7	29.8	18.4	14.0	
643	3543	Trips	1,884	580	-	1,133	631	3,768	2,190	2,157	13,183
643	3543	Percent	15.3	4.7	-	9.2	5.1	30.5	17.7	17.5	
644	3544	Trips	1,948	-	-	-	2,227	5,534	3,264	3,082	17,780
644	3544	Percent	12.1	-	-	-	13.9	34.5	20.3	19.2	
645	3545	Trips	1,314	-	-	-	844	1,661	2,170	1,703	8,075
645	3545	Percent	17.1	-	-	-	11.0	21.6	28.2	22.1	
646	3546	Trips	1,025	-	125	496	263	1,741	1,656	1,299	6,976
646	3546	Percent	15.5	-	1.9	7.5	4.0	26.4	25.1	19.7	
647	3547	Trips	296	122	96	109	79	582	661	405	2,490
647	3547	Percent	12.6	5.2	4.1	4.6	3.4	24.8	28.1	17.3	
648	3548	Trips	943	278	128	313	73	1,525	1,351	576	5,397
648	3548	Percent	18.2	5.4	2.5	6.0	1.4	29.4	26.0	11.1	
649	3549	Trips	643	120	121	216	43	873	952	508	3,661
649	3549	Percent	18.5	3.4	3.5	6.2	1.3	25.1	27.4	14.6	
650	3550	Trips	60	71	65	8	14	279	312	136	969
650	3550	Percent	6.4	7.5	6.9	0.9	1.5	29.5	33.0	14.4	

SR 907 / ALTON RD

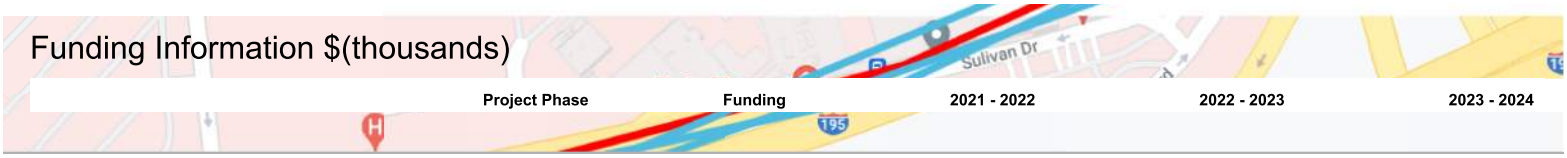
Search for a place

Clear

Project Information

MPO Project No.	DT4291931
Project Name	SR 907 / ALTON RD
Location/From	FROM MICHIGAN AVE
Location/To	TO SOUTH OF ED SULLIVAN DR / 43 ST
Description	.
TIP Year	2022
Type of Project	Arterial/Collector Road
Agency	FL Dept. of Transportation
Management Agency :	FDOT
Type of Work	FLEXIBLE PAVEMENT RECONSTRUCT.
Status	
Construction Year	2025
Next Step	
Agency Project No.	4291931
Contact Person	
Contact E-mail	
Phone No	

Funding Information $(thousands)



Project Phase	Funding	2021 - 2022	2022 - 2023	2023 - 2024

CONTACT US | ABOUT US

I-195 / SR 112

Project Information

MPO Project No.	DT4402281
Project Name	I-195 / SR 112
Location/From	FROM NW 12 AVE
Location/To	TO SR 907 / ALTON RD
Description	.
TIP Year	2022
Type of Project	Expressway
Agency	FL Dept. of Transportation
Management Agency :	FDOT
Type of Work	TRANSPORTATION PLANNING
Status	
Construction Year	
Next Step	
Agency Project No.	4402281
Contact Person	
Contact E-mail	
Phone No	

Funding Information $(thousands)

Project Phase	Funding	2021 - 2022	2022 - 2023	2023

Beach Express North

Search for a place

Clear

Project Details

LRTP Project Code	MDT229
Facility	Beach Express North
Limit From	Miami Beach Convention Center
Limit To	Golden Glades Multimodal Transportation Facility (
Description	Implement Bus Express Rapid Transit service
LRTP Year	2045
Project Type	Transit
Agency Name	Miami-Dade Dept. of Transportation and Public Works
Purpose	
Last Approved Date	
Last Approved User Name	
Last Amended Date	
Last Amended User Name	

Priority Data

	Priority 1 2020-2025 (Y-O-E $)	Priority 2 2026-2030 (Y-O-E $)	Priority 3 2031-2035 (
Preliminary Engineering	$1.579M		
Right of Way			
Construction	$9.425M		
Operations and Maintenance	$4.094M	$22.704M	

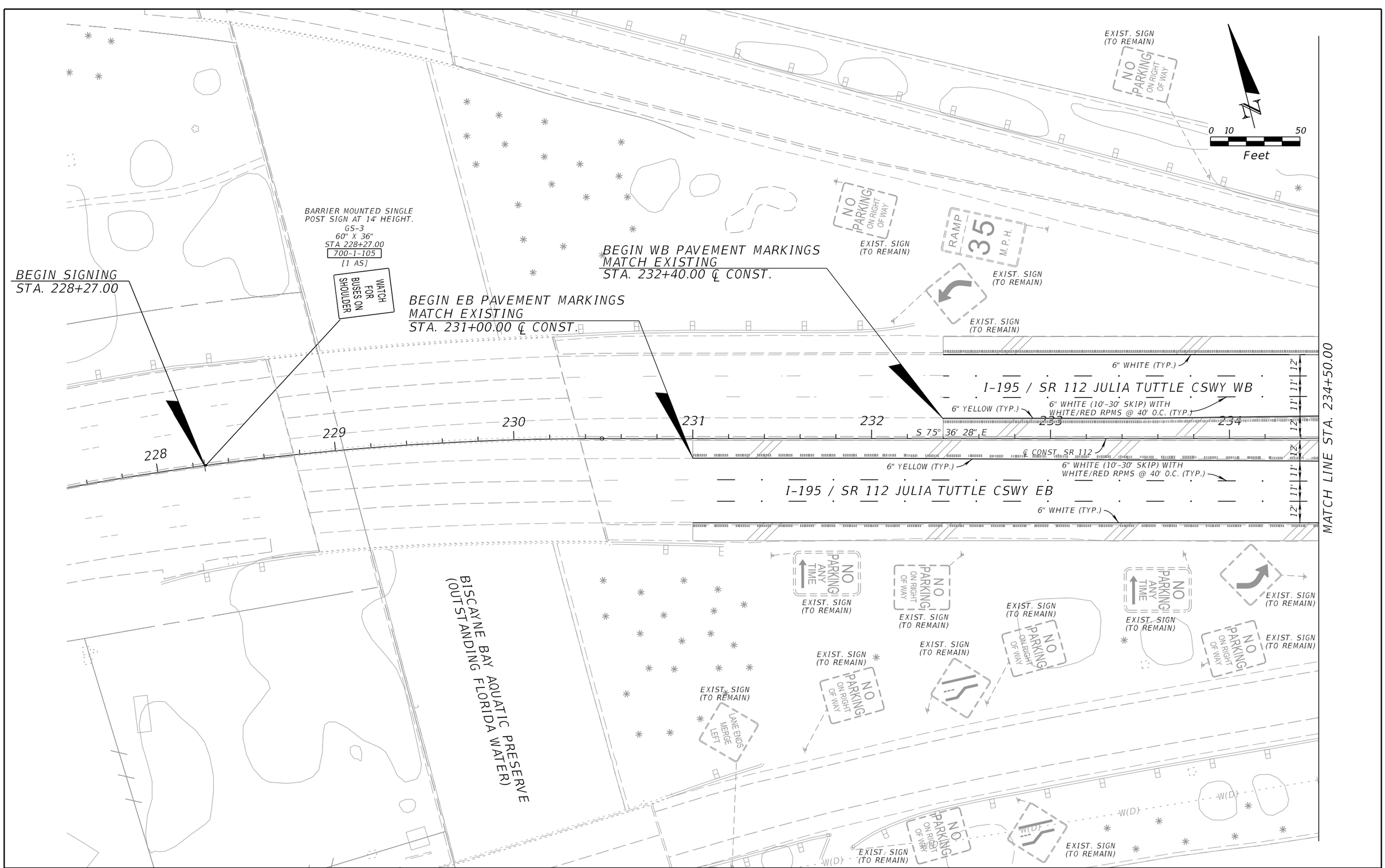
CAPACITY TRANSIT BIKE/PED

UPCOMING PROJECTS

MAP ID	PROJECT	LIMITS FROM	LIMITS TO	DESCRIPTION	TOTAL CAPITAL COST (2013 $)	PROJECT COSTS FUNDED VIA 2040 PLAN	FUNDING YEAR
PRIORITY I							
1	West Avenue Connector Bridge	North of Lincoln Road	South of 18th Street	New bridge construction			TIP and 2020
PRIORITY II							
2	79th Street Causeway (JFK Causeway) Enhanced Bus	Northside Metrorail Station	Miami beach Convention Center	Improve/implement transit service	$55.457	$218.867	2021 - 2025
PARTIALLY FUNDED PROJECTS							
3	Beach Connection (Baylink)	Miami Downtown Terminal	Miami beach Convention Center	Premium transit service	$166.400	$36.378	2026 – Beyond 2040
BICYCLE/PEDESTRIAN PROJECT - PRIORITY 1							
4	NE 79th Street	NE Bayshore Ct	Bay Drive	Bicycle Facility Improvement			2015 - 2020
5	Atlantic Trail	South Pointe Park/South Pointe Drive	5th Street	Trail improvement	$220.000	$296.01	2015 - 2020
6	Atlantic Trail	46 Block/Indian Beach Park	6400 Block/Allison Park	Trail improvement	$927.500	$1,397.279	2015 - 2020
7	Dade Boulevard Bike Path	Meridian Avenue	Atlantic Trail/Beachwalk	Trail improvement	$307.200	$462.797	2015 - 2020
8	Beachwalk Greenway/5th Street	Ocean Drive	Atlantic Trail/Beachwalk	Trail improvement	$19.600	$29.527	2015 - 2020
BICYCLE/PEDESTRIAN PROJECT - PRIORITY IV							
9	Pine Tree Drive/La Gorce	23rd Street	63rd Street	Bicycle Facility Improvements	$250.800	$568.187	2031 – 2040
10	Atlantic Trail (Broadwalk Replacement Project)	23rd Street	4600 Block/Indian Beach Park	Trail improvement	$658.800	$1,492.511	2031 – 2040
11	Atlantic Trail (North of Miami Beach)	North Shore Park	Haulover Park	Trail improvement	$2,128.400	$4,821.890	2031 – 2040
UNFUNDED PROJECTS							
12	I-195 Express Enhanced Bus (Central)	Miami Beach Convention Center	Miami Intermodal Center (MIC)	Express bus on managed lanes	$0.117		Pending
13	I-195 Express Enhanced Bus (North)	Miami Beach Convention Center	Golden Glades Interchange Terminal	Express bus on managed lanes	$0.137		Pending
14	Miami Beach LRT Collins Extension	Miami Beach Convention Center	71st Street	Extend Light rail north to 71st Street	$400.400		Pending

Data Source: Miami-Dade Long Range Transportation Plan 2040

Figure 35: Identified MPO Long Range Transportation Plan (LRTP) Projects within the City



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GABRIELA P. RAMIREZ, P.E.
P.E. LICENSE NUMBER 79620
KIMLEY-HORN AND ASSOCIATES, INC.
355 ALHAMBRA CIRCLE, SUITE 1400
MIAMI, FLORIDA 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO.
S-8

BARRIER MOUNTED SINGLE POST SIGN AT 14' HEIGHT.

GS-1
60" X 69"
GS-2B
60" X 18"
STA 236+48
700-1-105
[1 AS]

GS-1
60" X 69"
GS-2
60" X 18"
STA 236+51
700-1-105
[1 AS]

EXIST. SIGN (TO REMAIN)

REMOVE EXIST. SIGN
700-1-60
[1 AS]

BARRIER MOUNTED SINGLE POST SIGN AT 14' HEIGHT.
R8-7
48" X 36"
STA 237+48
700-1-105
[1 AS]

REMOVE EXIST. SIGN SUPPORT STRUCTURE

700-3-603	1 EA
700-3-607	1 EA
700-4-620	1 EA

0 10 50
Feet

EXIST. SIGN (TO REMAIN)

MATCH LINE STA. 234+50.00

MATCH LINE STA. 241+50.00

+45.88

18" WHITE @ 20' O.C.

6" WHITE (TYP.)

R 1650'

+53.95
MATCH EXIST.

6" WHITE WITH WHITE/RED RPMS @ 40' O.C.

8" WHITE WITH WHITE/RED RPMS @ 20' O.C.

+31.40

1639.7' R

6" WHITE (3'-9' SKIP)

VAR. 11' 11' 12'

235 236 237 238 239 240 241

I-195 / SR 112 JULIA TUTTLE CSWY WB

S 75° 36' 28" E

+01.92

6" YELLOW PROFILED THERMOPLASTIC (TYP.)

℄ CONST. SR 112

I-195 / SR 112 JULIA TUTTLE CSWY EB

+97.02

+54.72

6" WHITE (10'-30' SKIP) WITH WHITE/RED RPMS @ 40' O.C. (TYP.)

EXIST. SIGN (TO REMAIN)

EXIST. SIGN (TO REMAIN)
700-13-17
[1 EA]

+98.23

+55.48

6" WHITE WITH WHITE/RED RPMS @ 40' O.C.

12" WHITE WITH WHITE/RED RPMS @ 20' O.C.

6" WHITE (3'-9' SKIP) WITH WHITE/RED RPMS @ 24' O.C.

BFOC(D)

W(D)

WATCH FOR BUSES ON SHOULDER

GS-2
60" X 36"
STA 236+20.26
700-1-12
[1 AS]

EXIST. SIGN (TO REMAIN)
700-13-17
[1 EA]

REMOVE EXIST. SIGN
700-1-60
[1 AS]

Biscayne Blvd

EXIT 2B

NO PARKING ON RIGHT OF WAY

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REVISIONS			
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO. S-9

EXIT 2B
1
Biscayne Blvd

GS-4
22.5' X 9'
GS-4A
11.5' X 2.5'

STA. 241+57
OFFSET: 73' LT
700-3-203 [1 EA]
700-3-207 [1 EA]
700-4-114 [1 EA]

REMOVE EXIST. SIGN 700-1-60 [1 AS]
REMOVE EXIST. SIGN 700-1-60 [1 AS]
W1-2AR 48" X 48" STA. 242+10 700-1-12 [1 EA]
REMOVE EXIST. SIGN 700-1-60 [1 AS]
EXIST. SIGN (TO REMAIN) EXIT 40 M.P.H
REMOVE EXIST. SIGN 700-1-60 [1 AS]
EXIST. SIGN (TO REMAIN) ARENAS/PAC NEXT RIGHT
EXIST. SIGN (TO REMAIN) NO PARKING ON RIGHT OF WAY
W1-2R 36" X 36" STA. 246+85 700-1-11 [1 EA]
EXIST. SIGN (TO REMAIN) TO FLORIDA'S TURNPIKE

BEGIN BRIDGE NO. 870301
STA. 247+75.50

0 10 50
Feet

6" WHITE (TYP.)
6" YELLOW PERMANENT TAPE (TYP.)
+75.50
+51.87
6" WHITE (3'-9' SKIP) (TYP.)
6" WHITE PERMANENT TAPE

MATCH LINE STA. 241+50.00

I-195 / SR 112 JULIA TUTTLE CSWY WB

242 243 244 245 246 247 248

6" YELLOW PROFILED THERMOPLASTIC (TYP.)
S 89° 46' 15" E
℄ CONST. SR 112

I-195 / SR 112 JULIA TUTTLE CSWY EB

6" WHITE (10'-30' SKIP) WITH WHITE/RED RPMS @ 40' O.C. (TYP.)
+44.11
+59.47
2.3'
BARRIER

MATCH LINE STA. 248+50.00

6" WHITE PERMANENT TAPE
6" WHITE (TYP.)
6" WHITE (10'-10'-20' SKIP) WITH WHITE/RED RPMS @ 40' O.C. (WITH BLACK CONTRAST) (TYP.)

BFOC(D) W(D)

SPEED LIMIT 55 — EXIST. SIGN (TO REMAIN)
EAST INFIELD 195 — EXIST. SIGN (TO REMAIN)
NO PARKING ON RIGHT SHOULDER OF WAY — EXIST. SIGN (TO REMAIN)
BIKE LANE
REMOVE EXIST. SIGN 700-1-60 [1 AS]
REPORT DUMPING FLORIDA HIGHWAY PATROL DIAL *FHP (347) — EXIST. SIGN (TO REMAIN)
NO FISHING FROM BRIDGE — EXIST. SIGN (TO REMAIN)

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REVISIONS			
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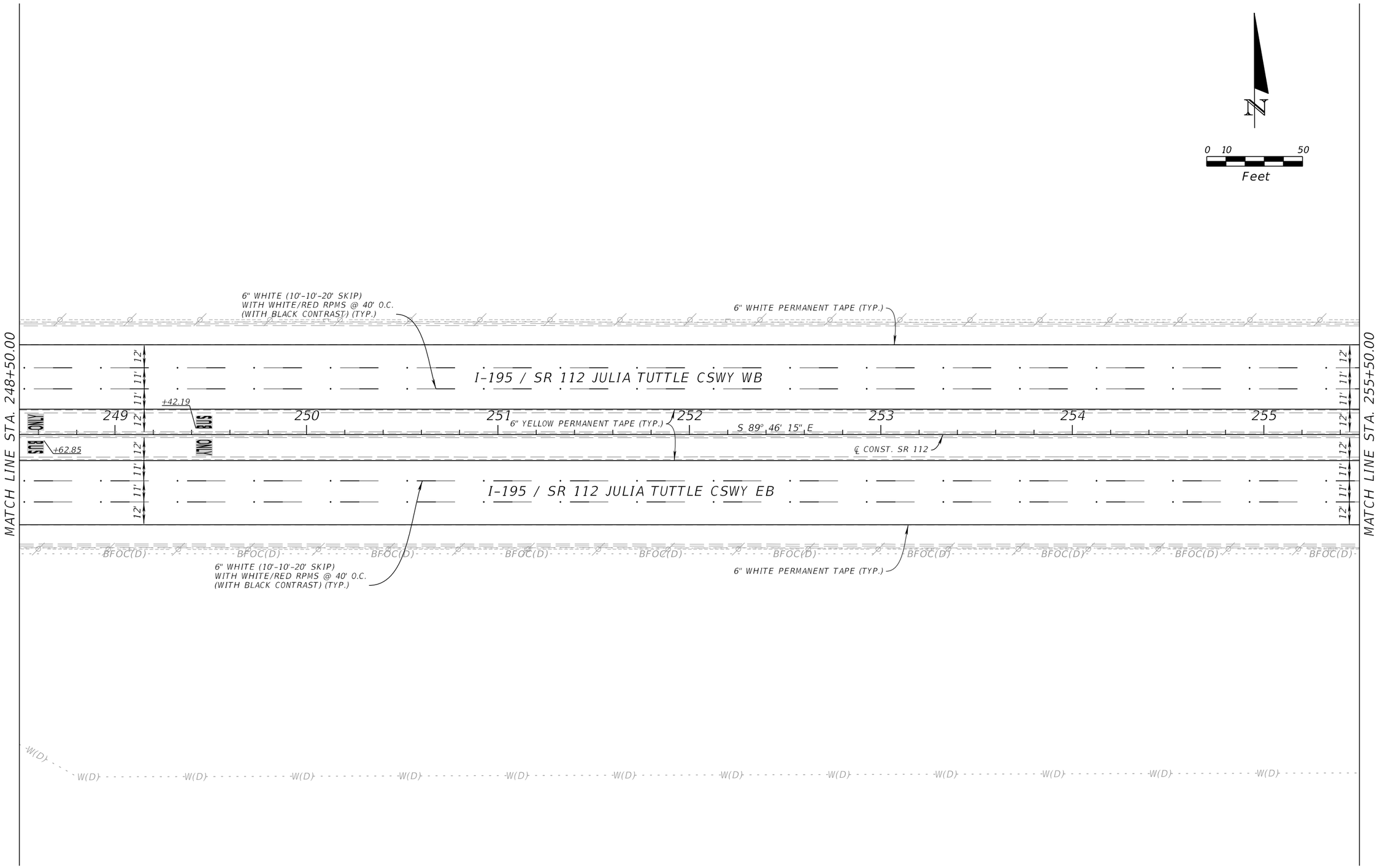
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO.
S-10



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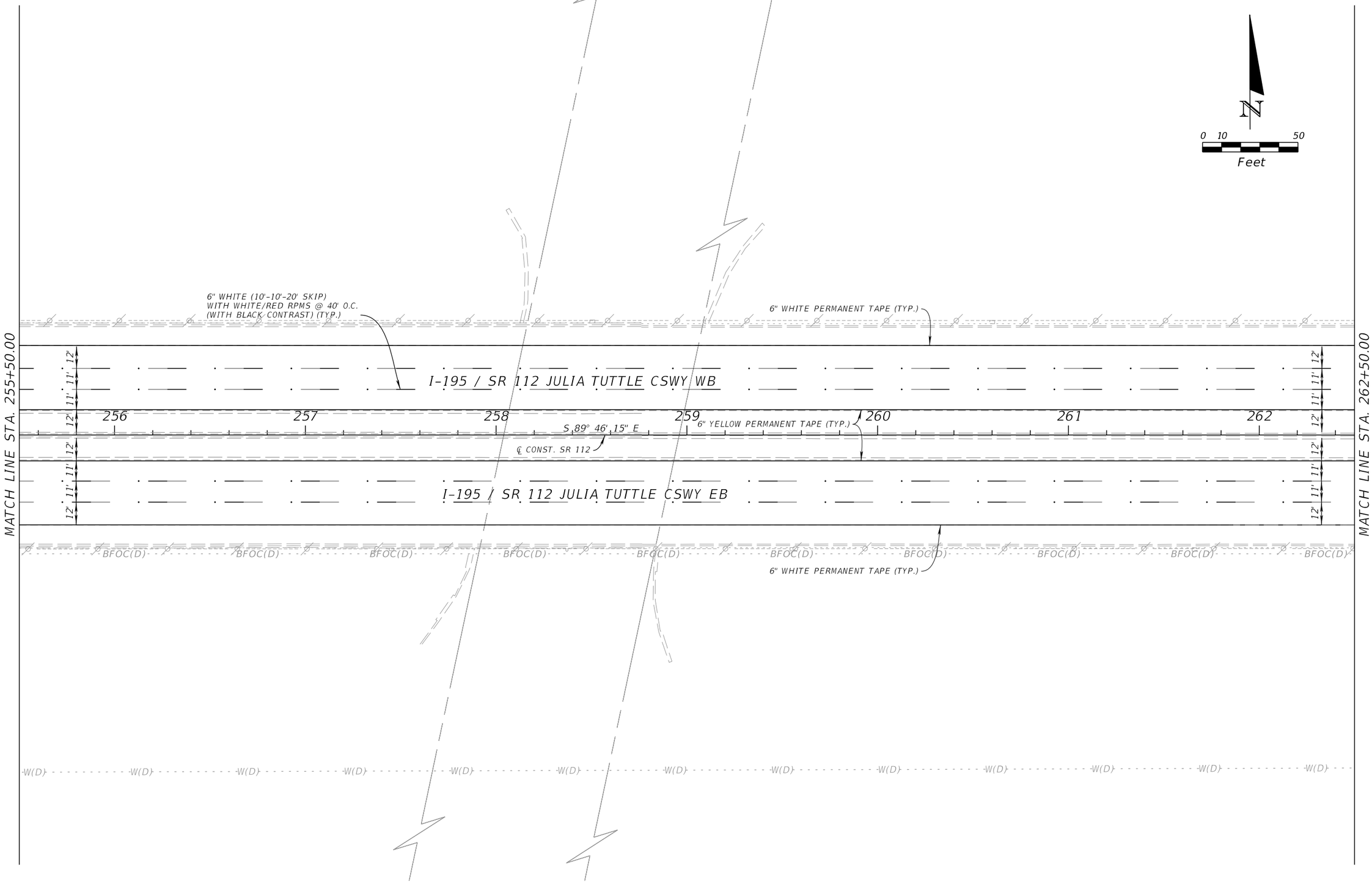
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO.
S-11



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SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO. S-12

N

0 10 50

Feet

END BRIDGE NO. 870301
STA. 269+24.75

6" WHITE (10'-10'-20' SKIP)
WITH WHITE/RED RPMS @ 40' O.C.
(WITH BLACK CONTRAST) (TYP.)

6" WHITE PERMANENT TAPE (TYP.)

6" WHITE (TYP.)

MATCH LINE STA. 262+50.00

MATCH LINE STA. 269+50.00

I-195 / SR 112 JULIA TUTTLE CSWY WB

I-195 / SR 112 JULIA TUTTLE CSWY EB

263 264 265 266 267 268 269

+43.31

+63.97

BUS ONLY

BUS ONLY

S 89° 46' 15" E

℄ CONST. SR 112

6" YELLOW PERMANENT TAPE (TYP.)

6" WHITE (10'-10'-20' SKIP)
WITH WHITE/RED RPMS @ 40' O.C.
(WITH BLACK CONTRAST) (TYP.)

6" WHITE PERMANENT TAPE (TYP.)

6" YELLOW PROFILED
THERMOPLASTIC (TYP.)

+24.75

12' 11' 11' 12'

BFOC(D)

W(D)

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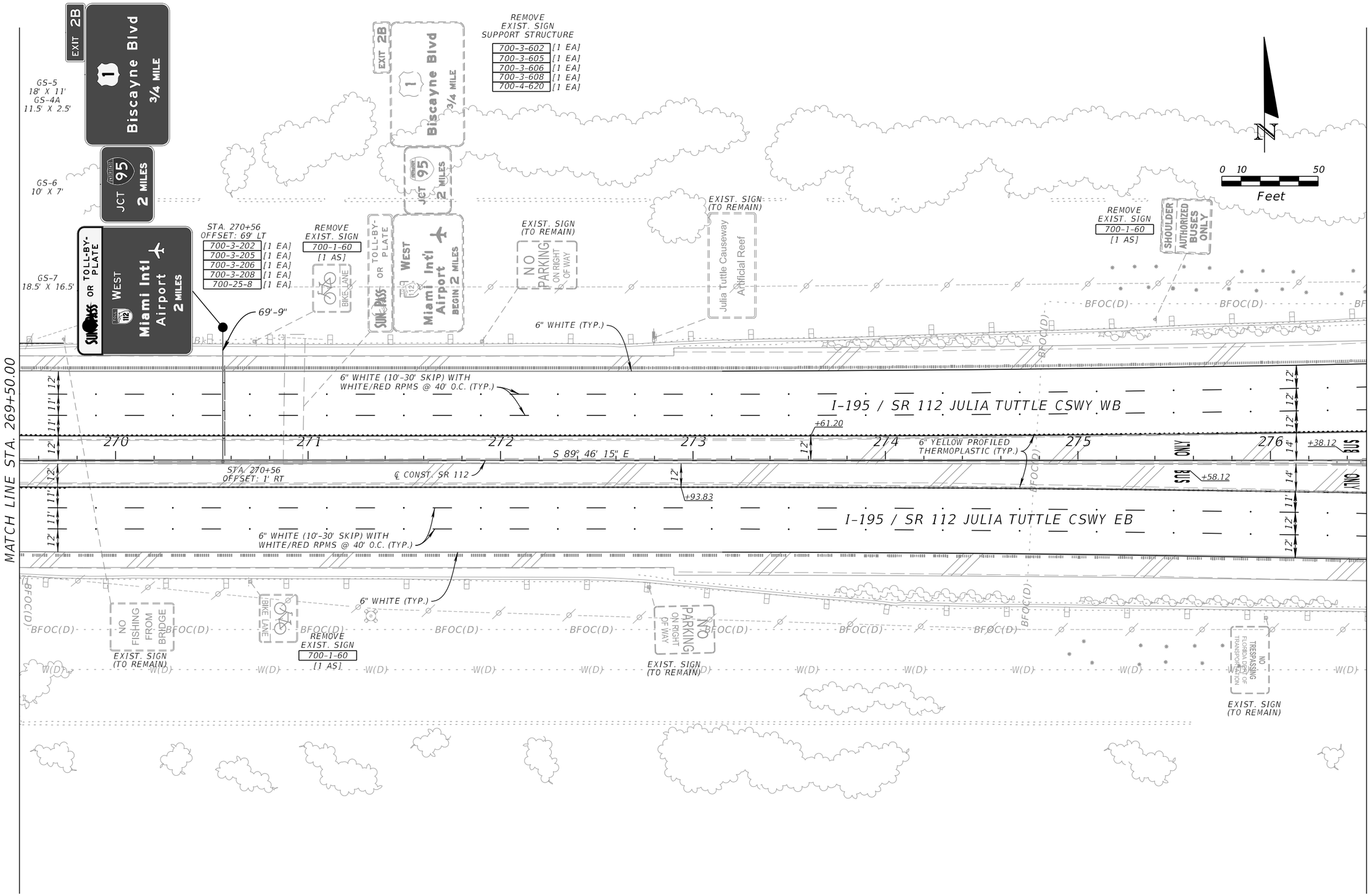
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO.
S-13



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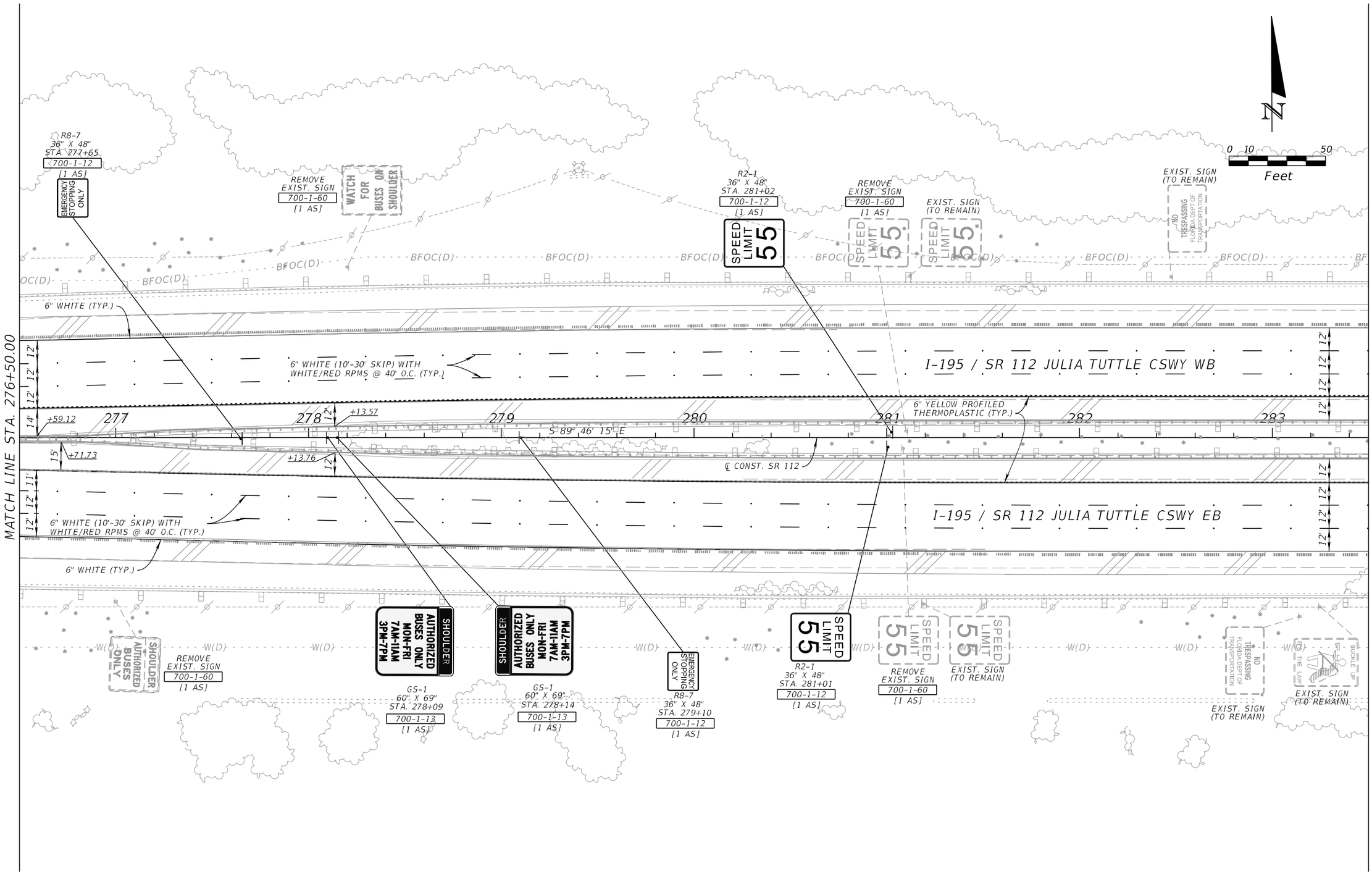
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO.
S-14



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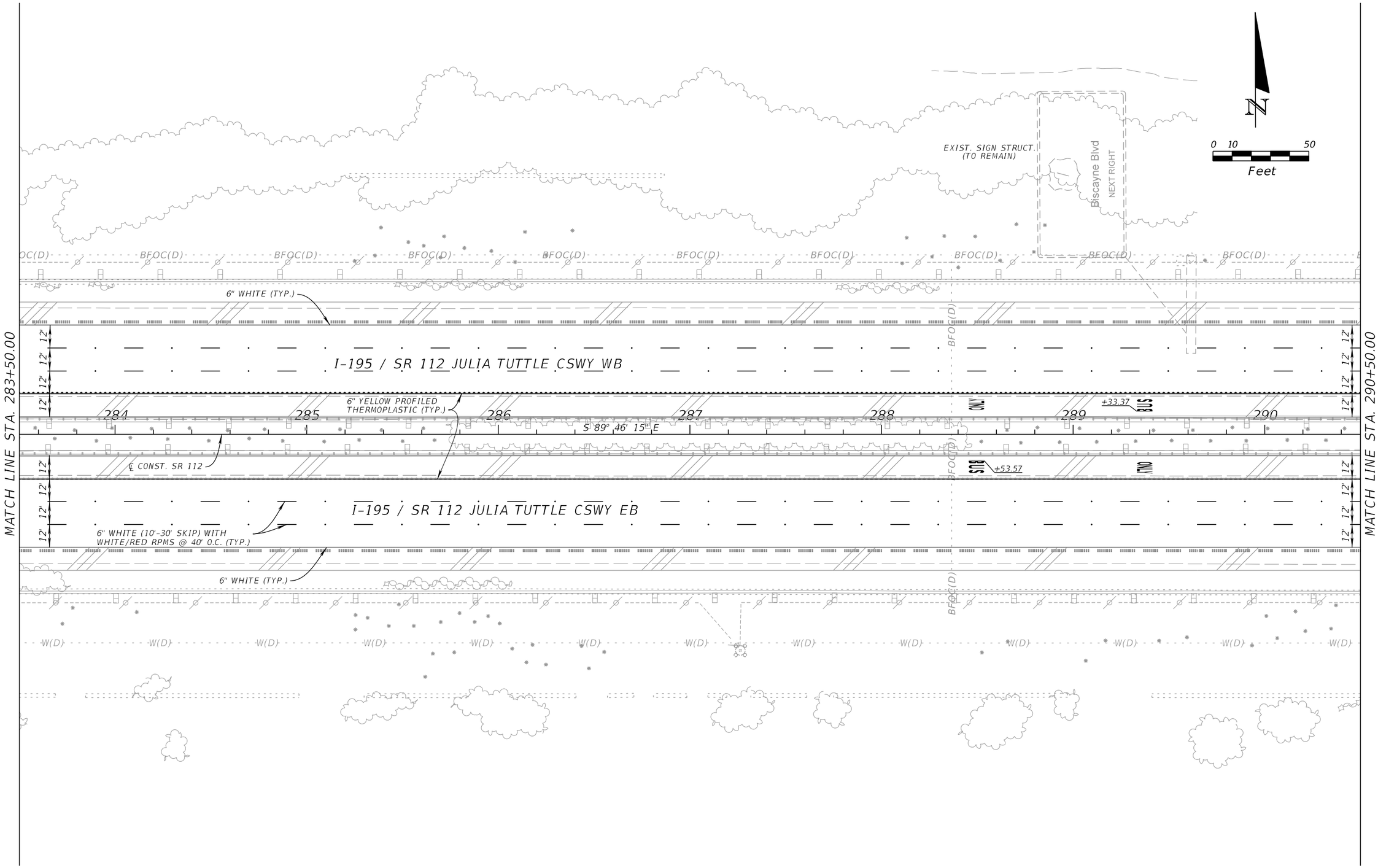
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO.
S-15



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DEPARTMENT OF TRANSPORTATION

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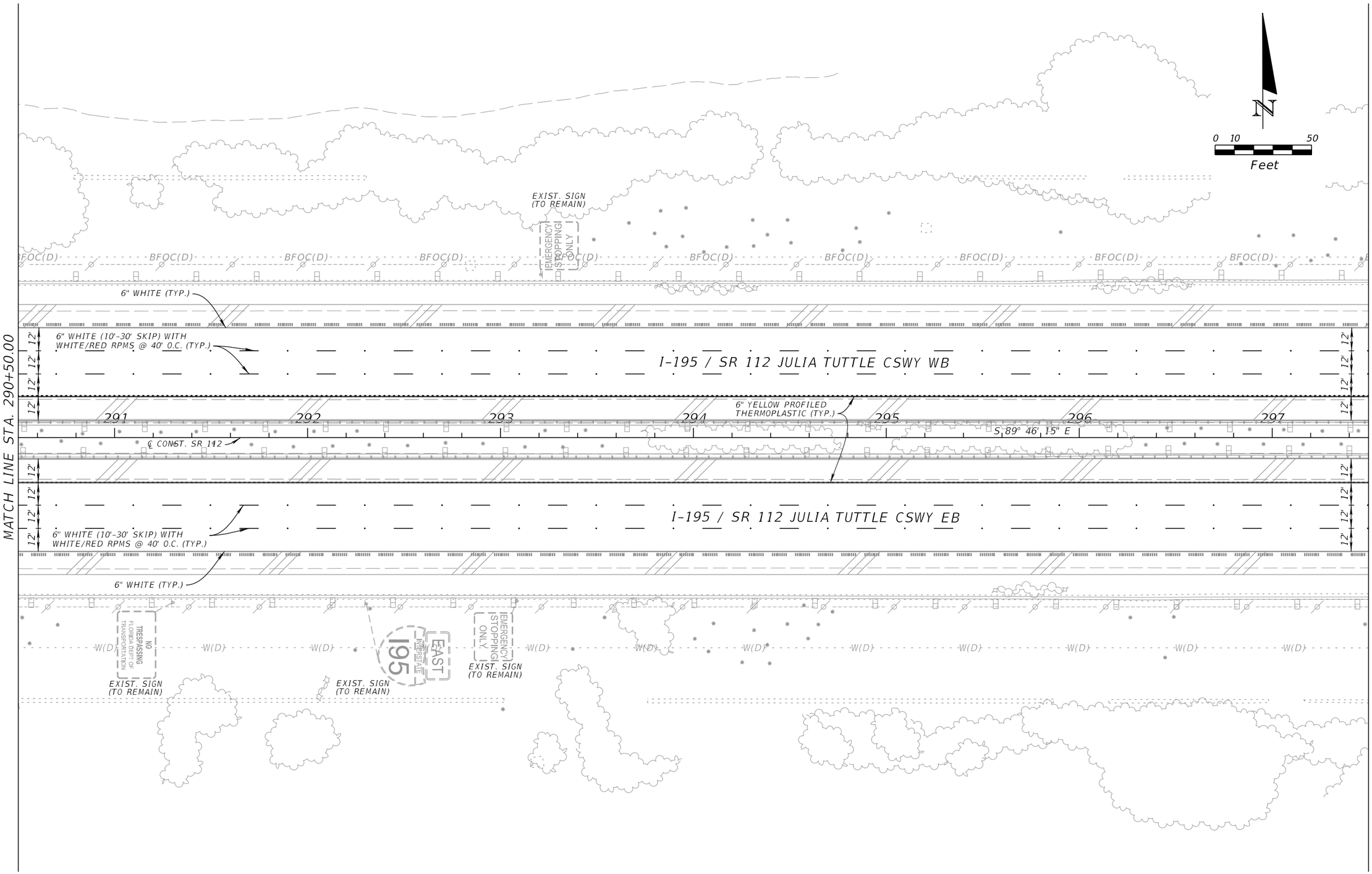
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO.
S-16



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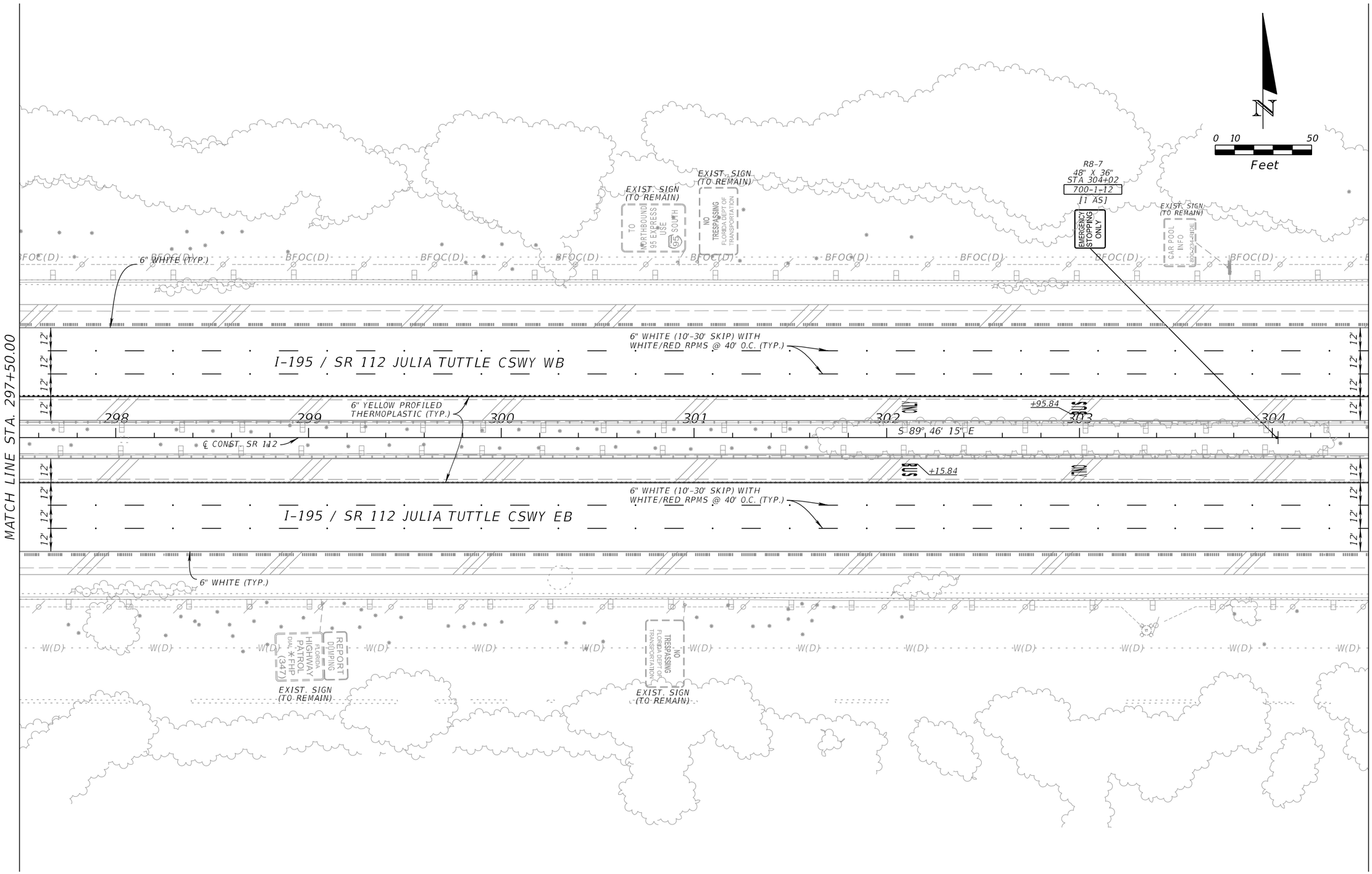
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO.
S-17



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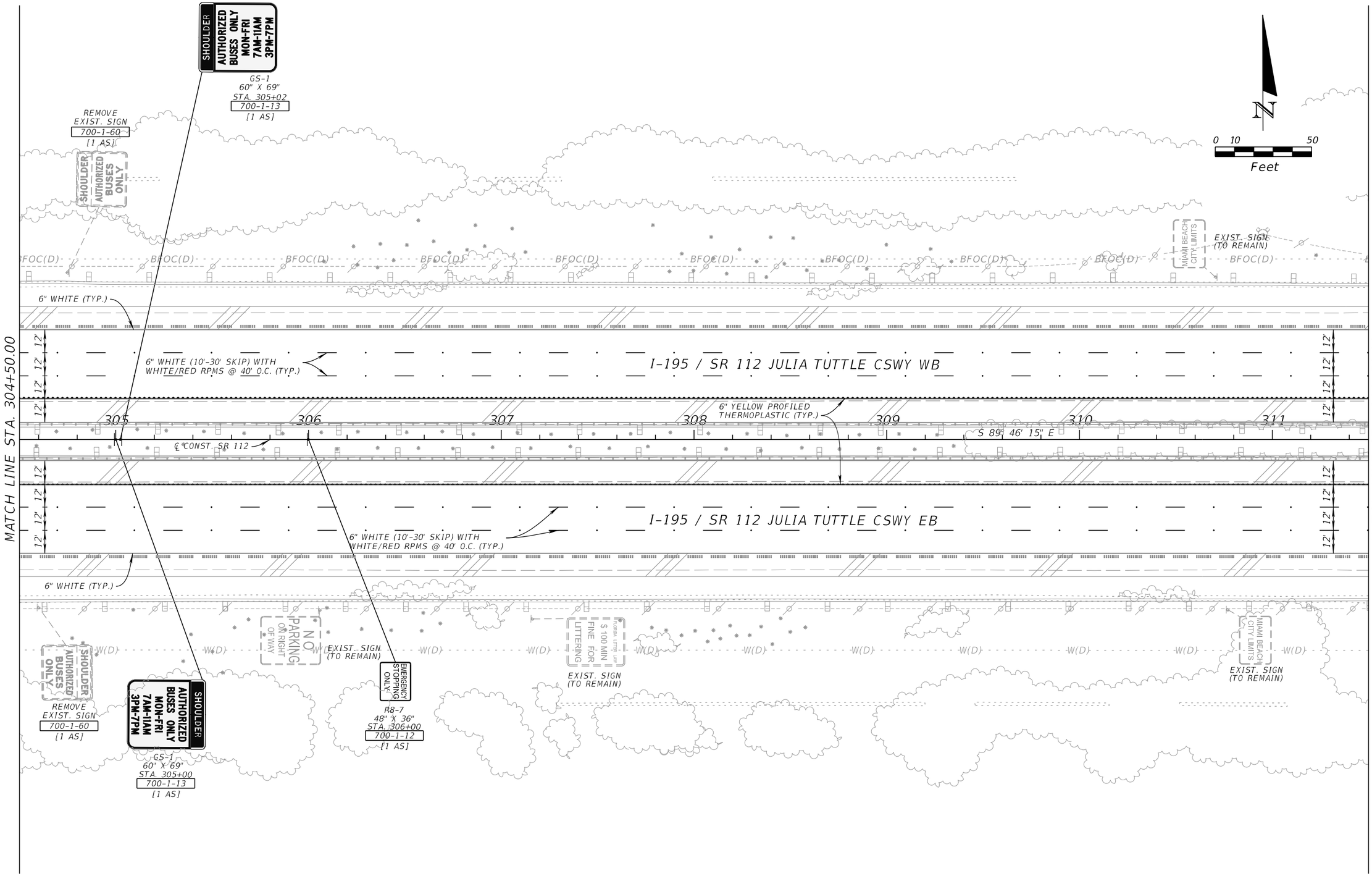
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO. S-18



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STATE OF FLORIDA
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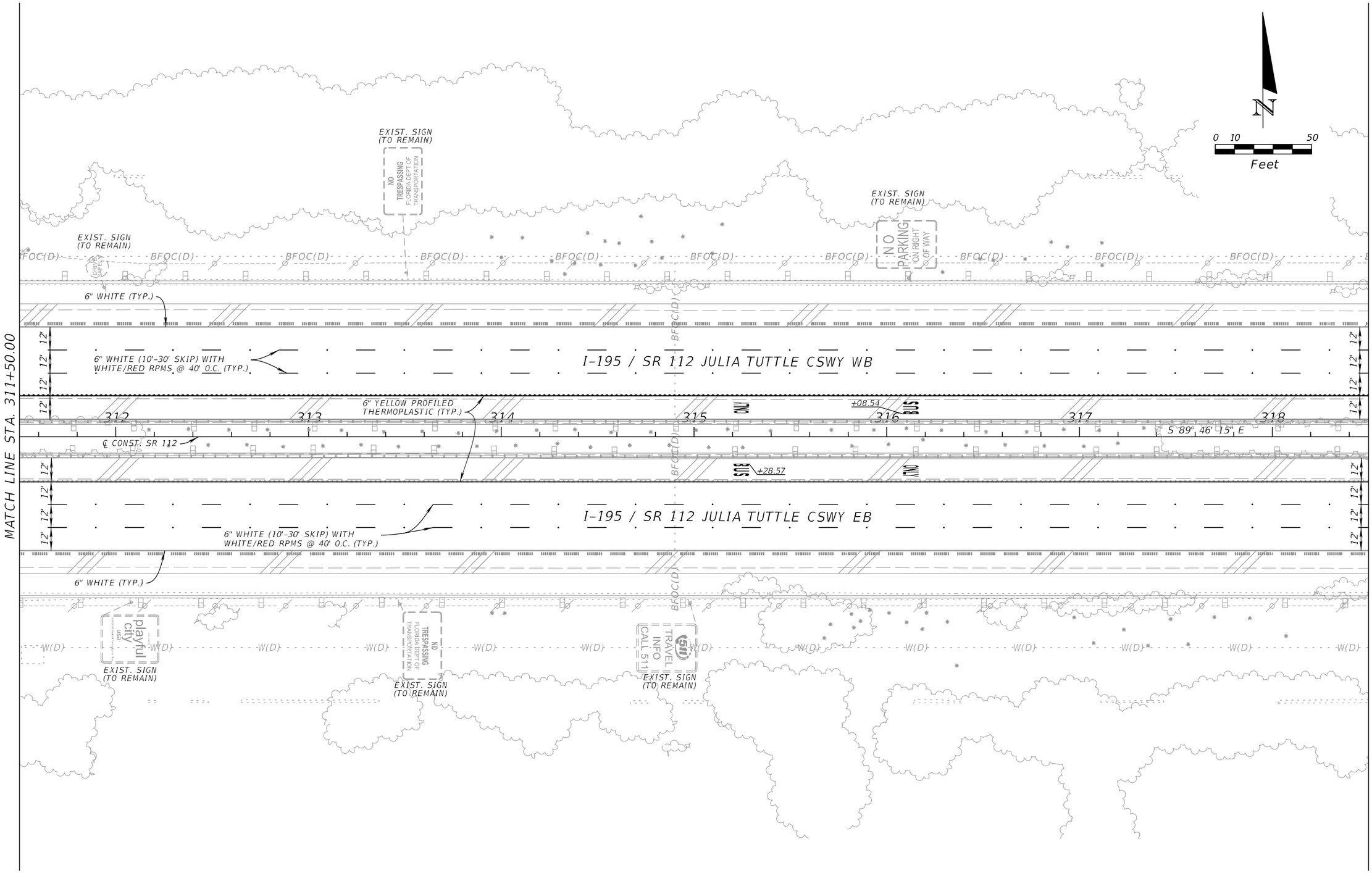
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO.
S-19



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MIAMI, FLORIDA 33134

STATE OF FLORIDA
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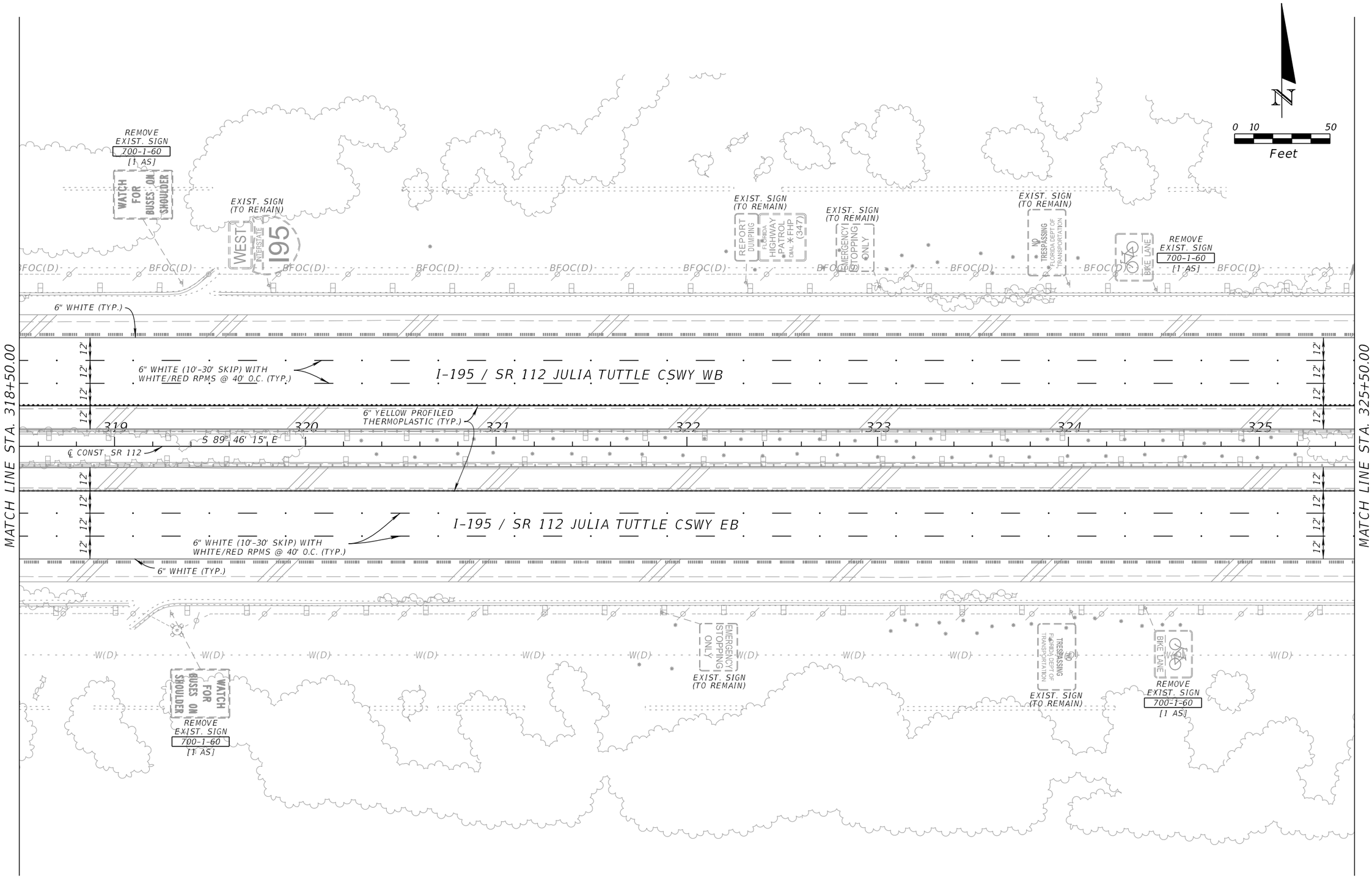
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO.
S-20



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SIGNING AND PAVEMENT MARKING PLAN

SHEET NO. S-21

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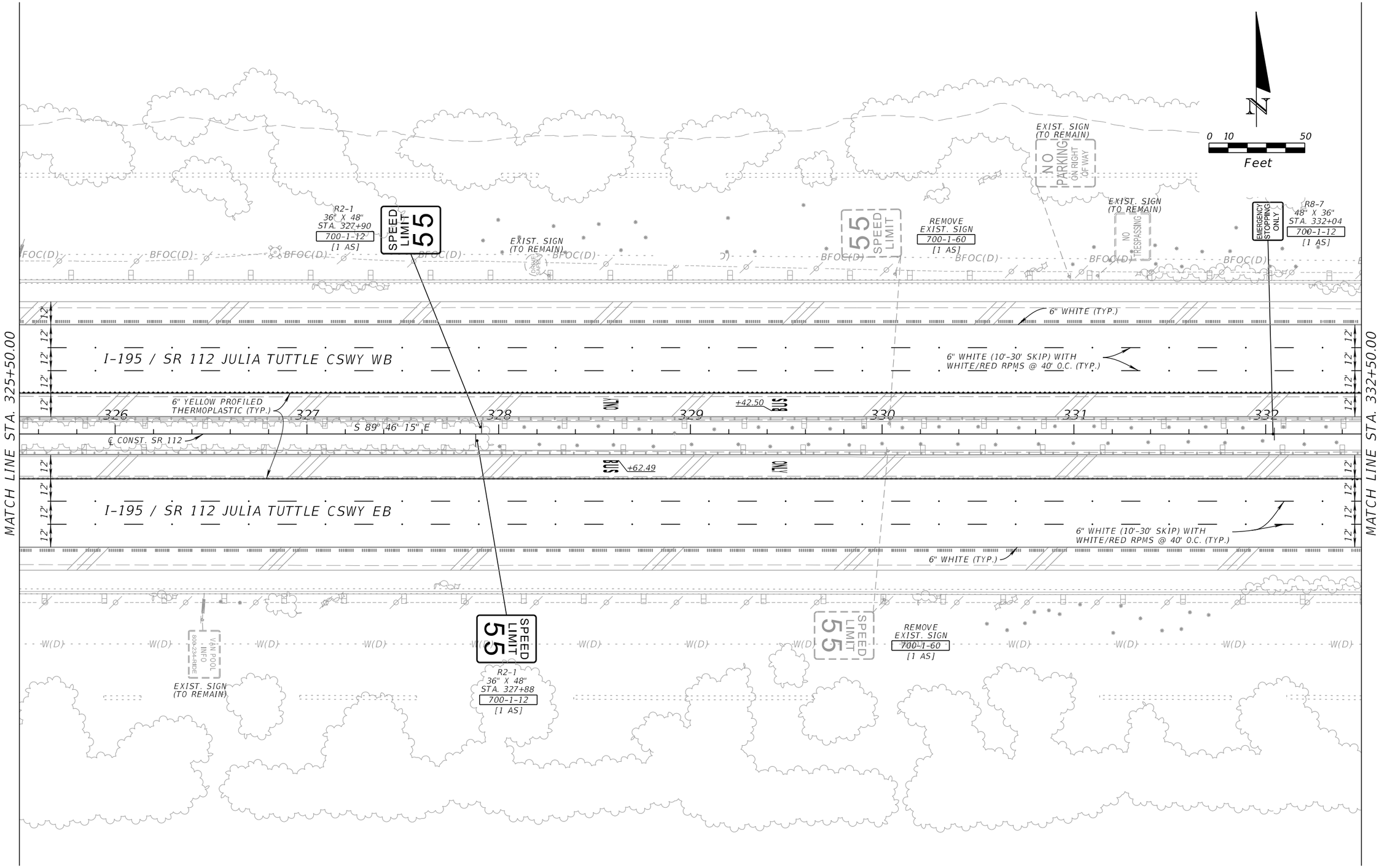

REVISIONS			
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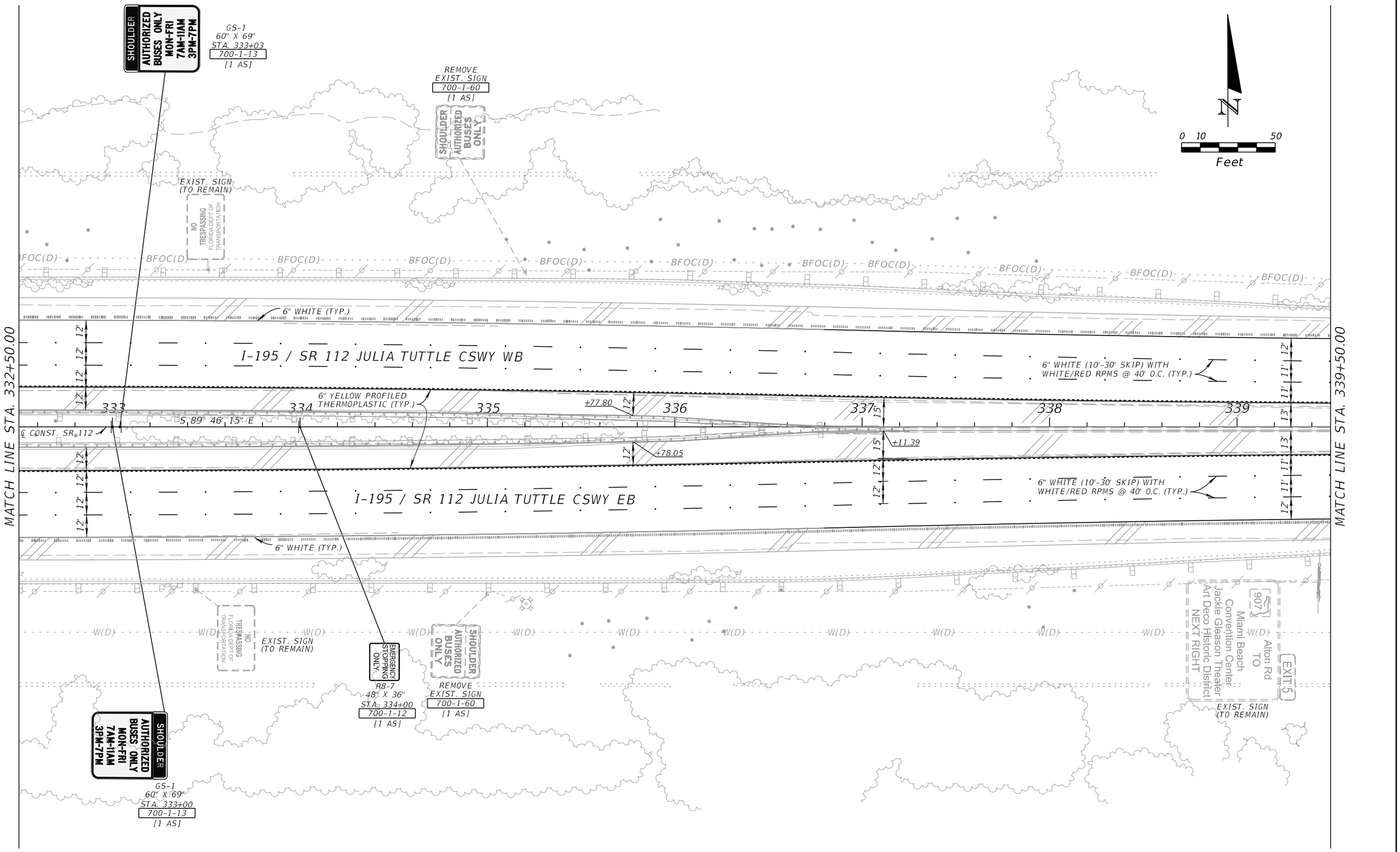
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO.
S-22



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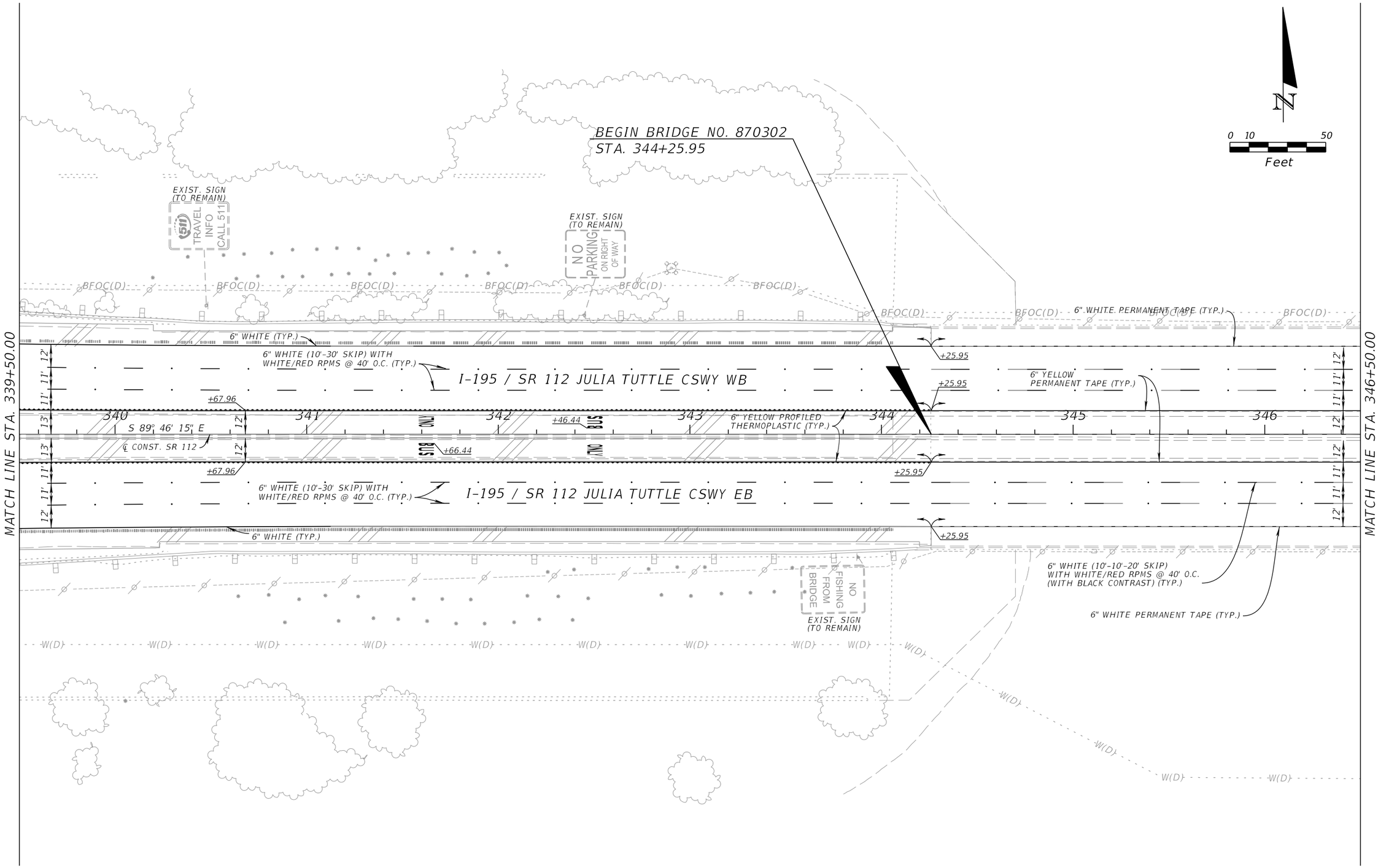
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO.
S-23



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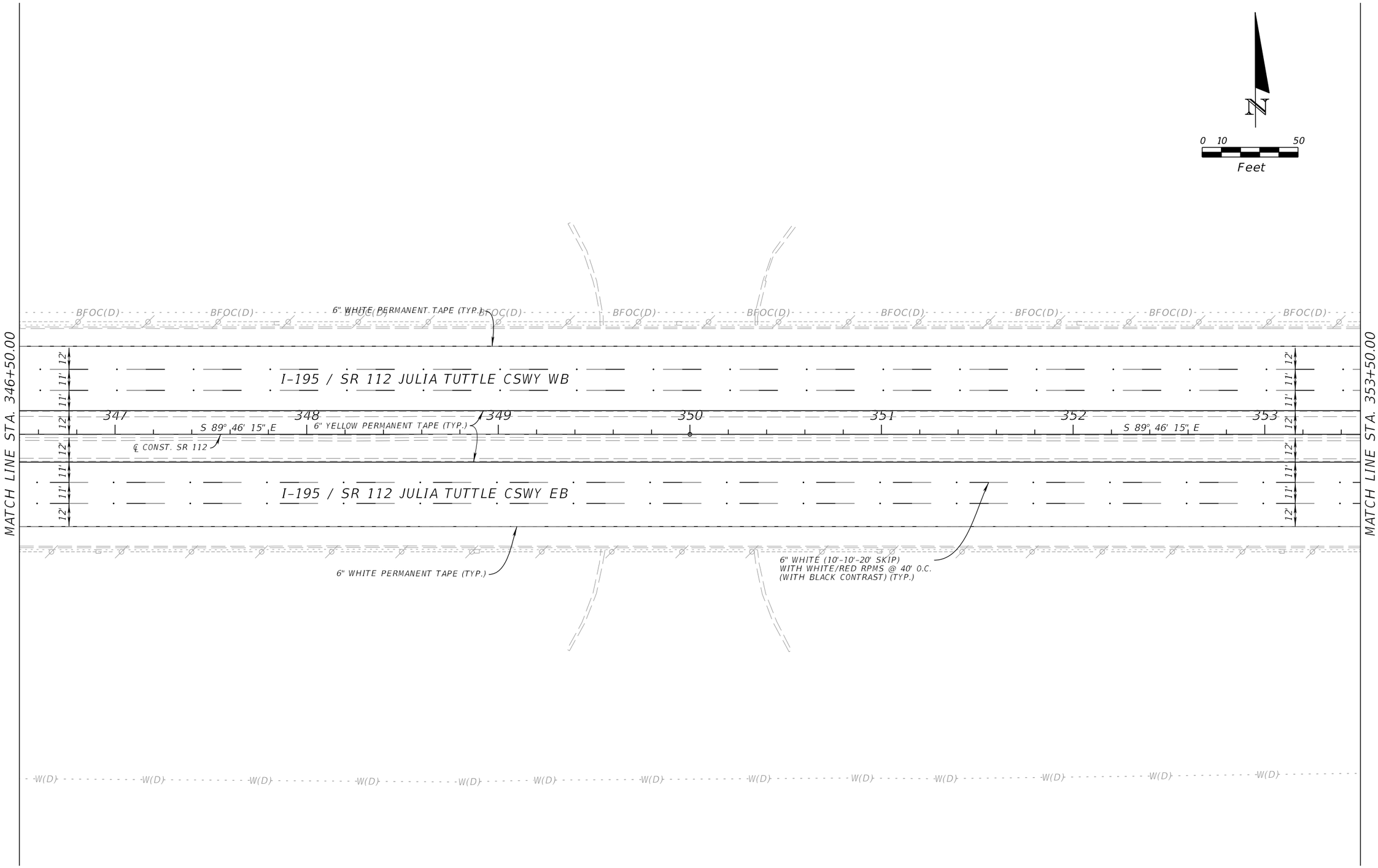
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO. S-24



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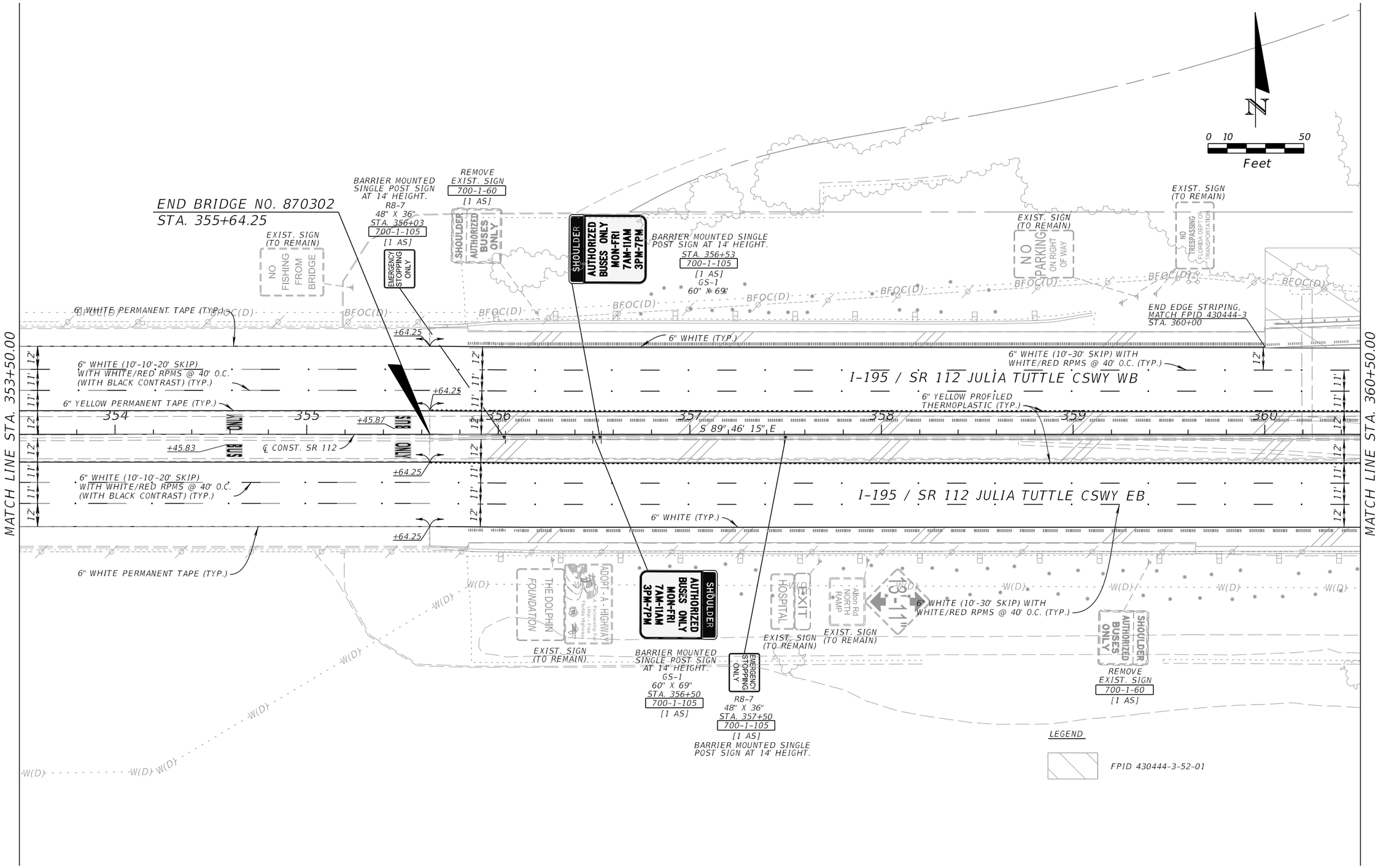
SIGNING AND PAVEMENT MARKING PLAN

SHEET NO.
S-25



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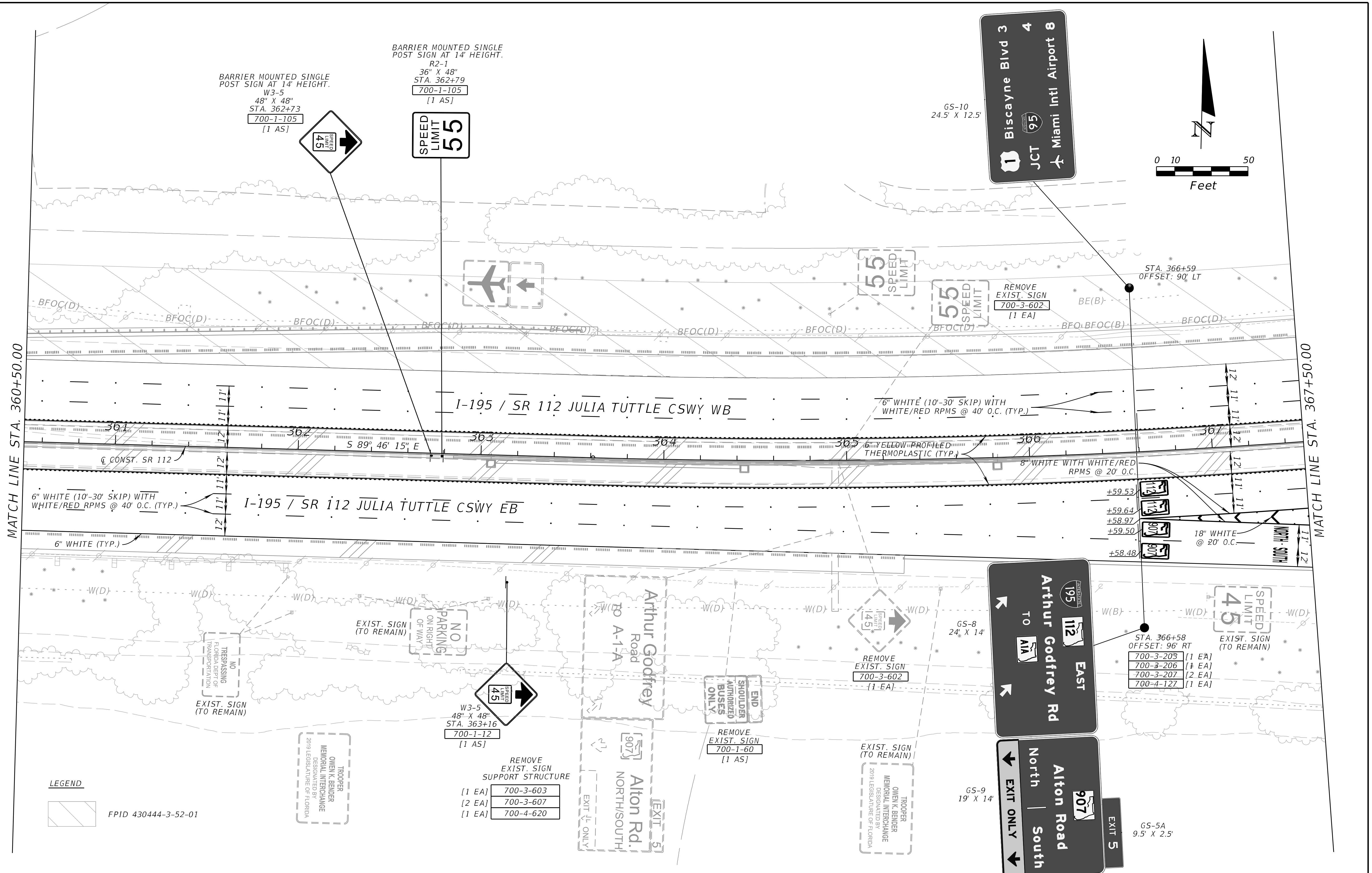
SIGNING AND PAVEMENT MARKING PLAN

SHEET NO. S-26



BARRIER MOUNTED SINGLE POST SIGN AT 14' HEIGHT.
W3-5
48" X 48"
STA. 362+73
700-1-105
[1 AS]
BARRIER MOUNTED SINGLE POST SIGN AT 14' HEIGHT.
R2-1
36" X 48"
STA. 362+79
700-1-105
[1 AS]
SPEED LIMIT 55
GS-10
24.5' X 12.5'
Biscayne Blvd 3
JCT 95 Miami Intl Airport 8
0 10 50
Feet
STA. 366+59
OFFSET: 90' LT
REMOVE EXIST. SIGN
700-3-602
[1 EA]
I-195 / SR 112 JULIA TUTTLE CSWY WB
I-195 / SR 112 JULIA TUTTLE CSWY EB
6" WHITE (10'-30' SKIP) WITH WHITE/RED RPMS @ 40' O.C. (TYP.)
6" YELLOW PROFILED THERMOPLASTIC (TYP.)
8" WHITE WITH WHITE/RED RPMS @ 20' O.C.
S 89° 46' 15" E
℄ CONST. SR 112
6" WHITE (TYP.)
18" WHITE @ 20' O.C.
MATCH LINE STA. 360+50.00
MATCH LINE STA. 367+50.00
EXIST. SIGN (TO REMAIN)
W3-5
48" X 48"
STA. 363+16
700-1-12
[1 AS]
REMOVE EXIST. SIGN SUPPORT STRUCTURE
[1 EA] 700-3-603
[2 EA] 700-3-607
[1 EA] 700-4-620
REMOVE EXIST. SIGN
700-1-60
[1 AS]
REMOVE EXIST. SIGN
700-3-602
[1 EA]
GS-8
24' X 14'
195 Arthur Godfrey Rd EAST TO 112 A1A
STA. 366+58
OFFSET: 96' RT
700-3-203 [1 EA]
700-3-206 [1 EA]
700-3-207 [2 EA]
700-4-127 [1 EA]
GS-9
19' X 14'
907 Alton Road North | South EXIT ONLY
GS-5A
9.5' X 2.5'
EXIT 5
LEGEND
FPID 430444-3-52-01

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GABRIELA P. RAMIREZ, P.E.
P.E. LICENSE NUMBER 79620
KIMLEY-HORN AND ASSOCIATES, INC.
355 ALHAMBRA CIRCLE, SUITE 1400
MIAMI, FLORIDA 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO. S-27

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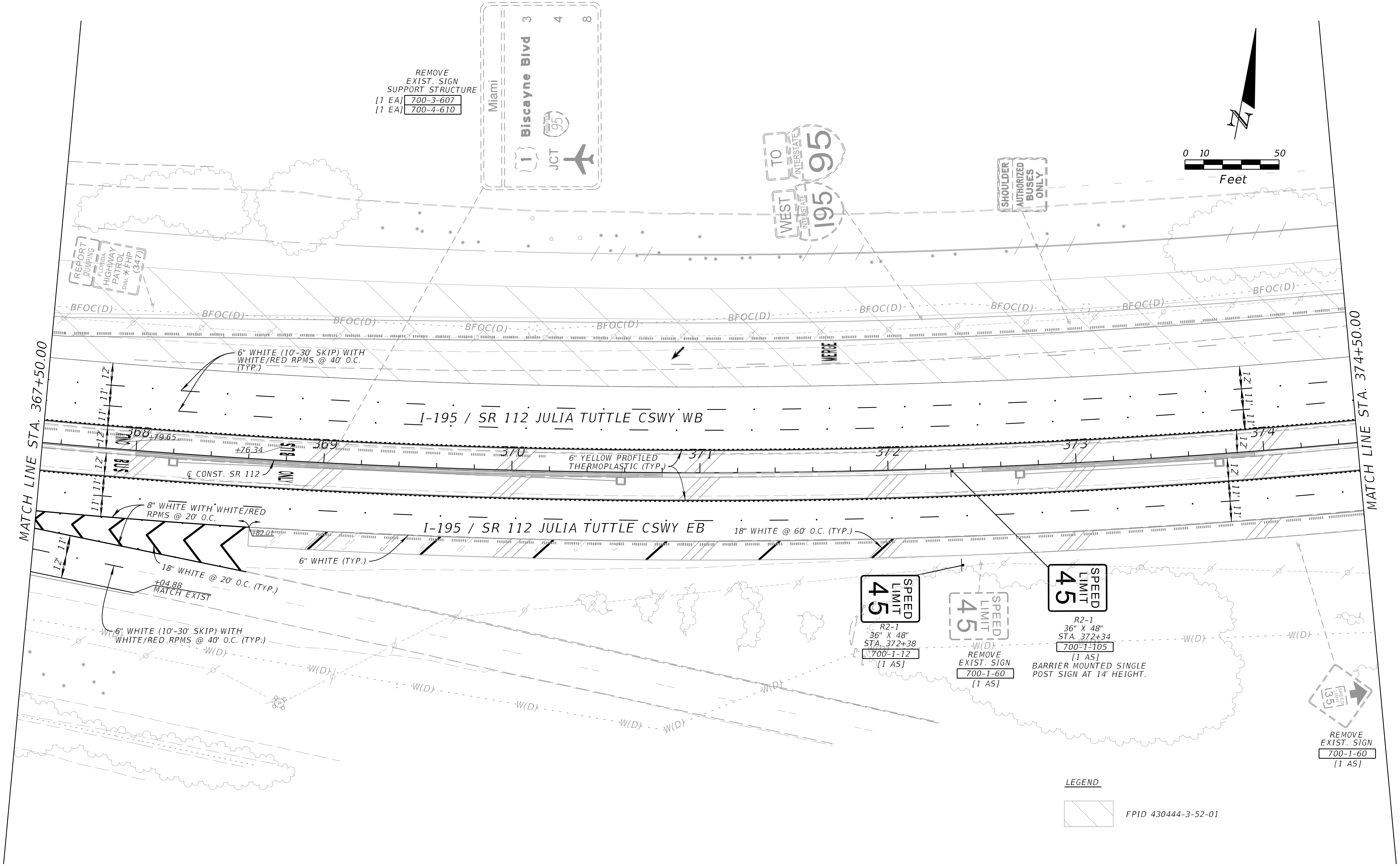
REMOVE
EXIST. SIGN
SUPPORT STRUCTURE
[1 EA] 700-3-607
[1 EA] 700-4-610
Miami
Biscayne Blvd
JCT
3
4
8
TO
WEST
95
195
SHOULDER
AUTHORIZED
BUSES
ONLY
0 10 50
Feet
MATCH LINE STA. 367+50.00
MATCH LINE STA. 374+50.00
6" WHITE (10'-30' SKIP) WITH
WHITE/RED RPMS @ 40' O.C.
(TYP.)
I-195 / SR 112 JULIA TUTTLE CSWY WB
368
+79.65
+76.34
369
370
371
372
373
374
6" YELLOW PROFILED
THERMOPLASTIC (TYP.)
℄ CONST. SR 112
8" WHITE WITH WHITE/RED
RPMS @ 20' O.C.
I-195 / SR 112 JULIA TUTTLE CSWY EB
+82.01
18" WHITE @ 60' O.C. (TYP.)
6" WHITE (TYP.)
18" WHITE @ 20' O.C. (TYP.)
+04.88
MATCH EXIST
6" WHITE (10'-30' SKIP) WITH
WHITE/RED RPMS @ 40' O.C. (TYP.)
SPEED
LIMIT
45
R2-1
36" X 48"
STA. 372+38
700-1-12
[1 AS]
REMOVE
EXIST. SIGN
700-1-60
[1 AS]
R2-1
36" X 48"
STA. 372+34
700-1-105
[1 AS]
BARRIER MOUNTED SINGLE
POST SIGN AT 14' HEIGHT.
REMOVE
EXIST. SIGN
700-1-60
[1 AS]
LEGEND
FPID 430444-3-52-01

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REVISIONS			
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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO.
S-28

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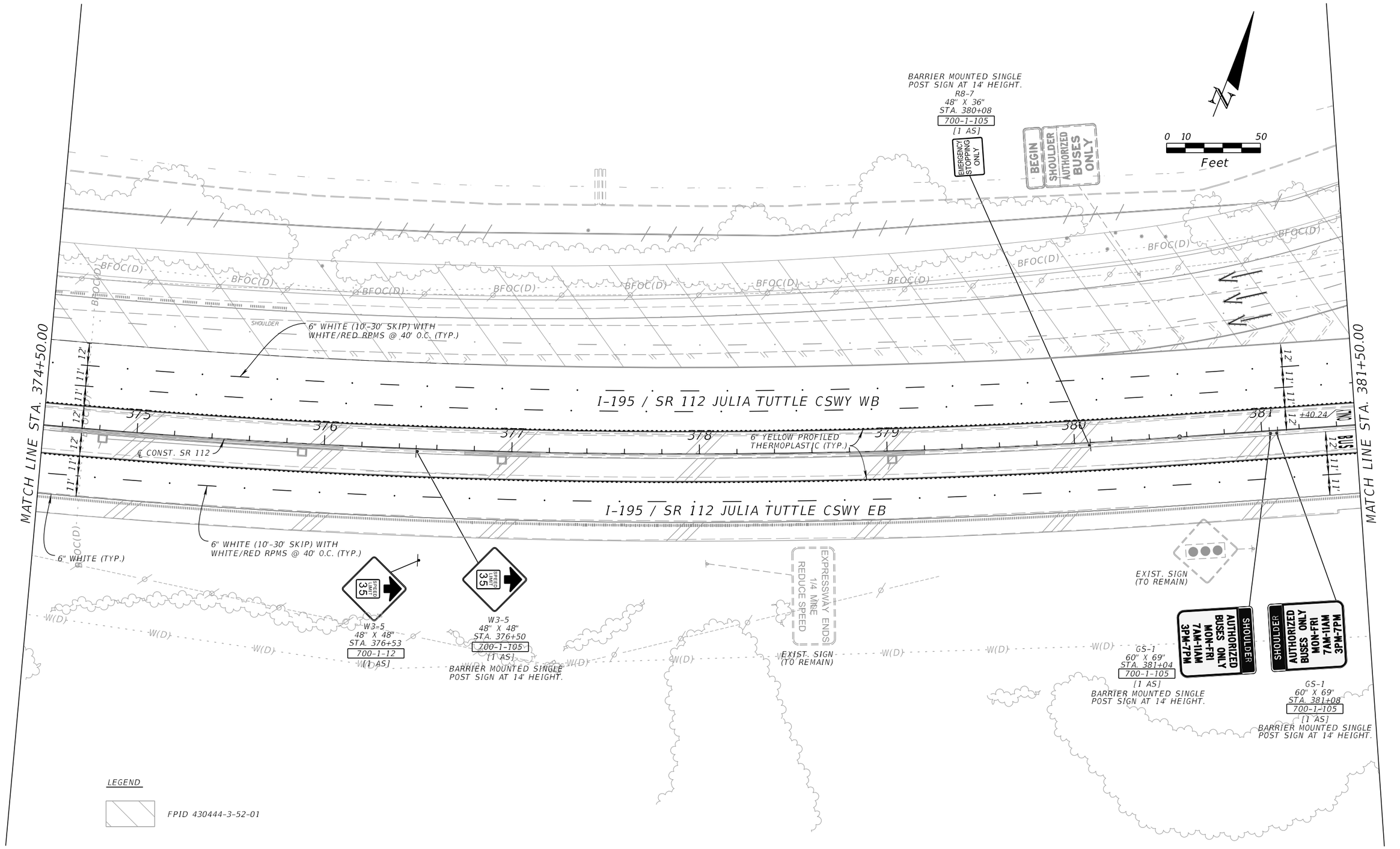

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

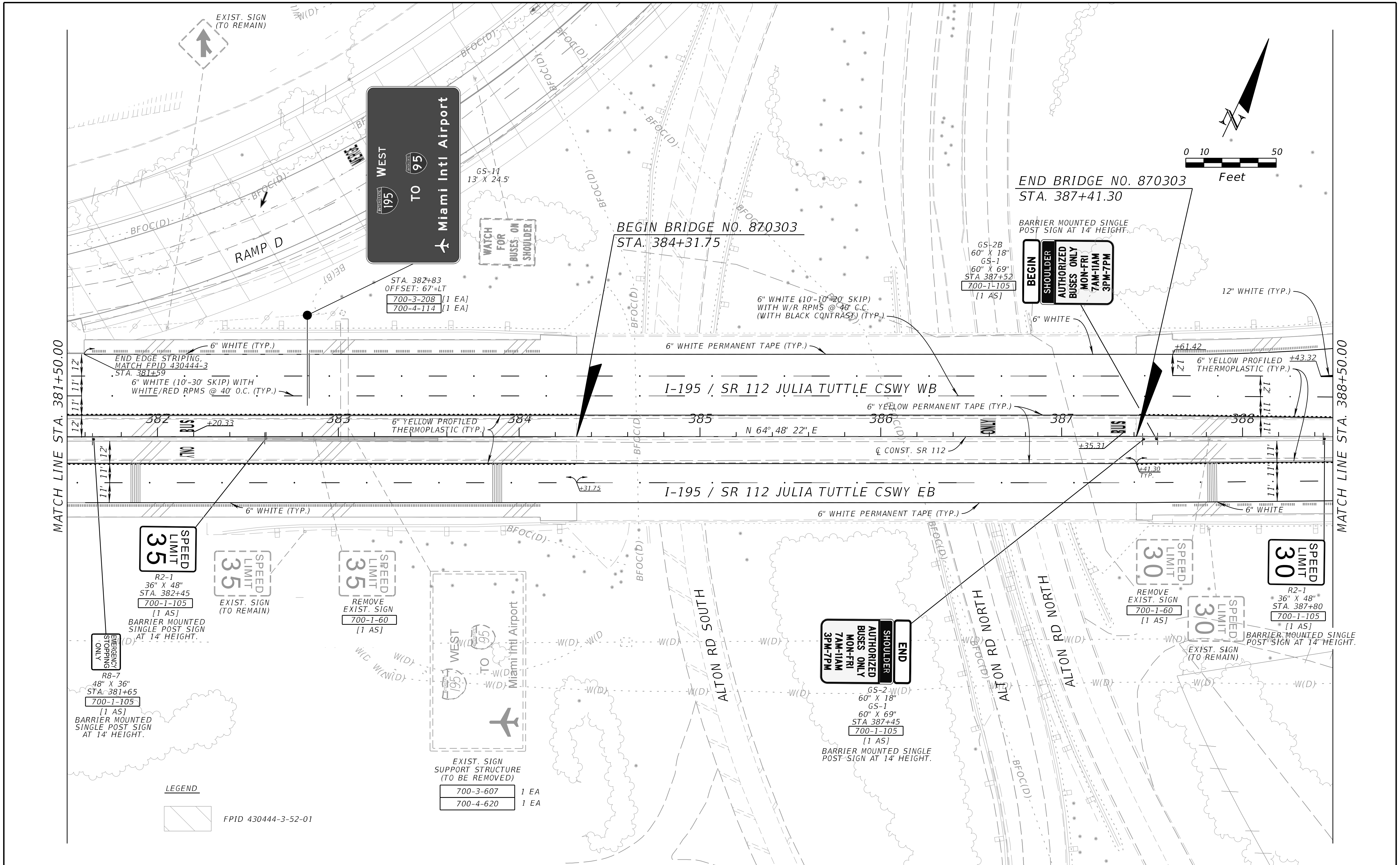
GABRIELA P. RAMIREZ, P.E.
P.E. LICENSE NUMBER 79620
KIMLEY-HORN AND ASSOCIATES, INC.
355 ALHAMBRA CIRCLE, SUITE 1400
MIAMI, FLORIDA 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO. S-29


EXIST. SIGN (TO REMAIN)
GS-11 13' X 24.5'
WEST
195
TO
95
Miami Intl Airport
WATCH FOR BUSES ON SHOULDER
RAMP D
STA. 382+83 OFFSET: 67' LT
700-3-208 [1 EA]
700-4-114 [1 EA]
BEGIN BRIDGE NO. 870303
STA. 384+31.75
END BRIDGE NO. 870303
STA. 387+41.30
BARRIER MOUNTED SINGLE POST SIGN AT 14' HEIGHT.
GS-2B 60" X 18"
GS-1 60" X 69"
STA 387+52
700-1-105
[1 AS]
BEGIN SHOULDER AUTHORIZED BUSES ONLY MON-FRI 7AM-11AM 3PM-7PM
0 10 50
Feet
6" WHITE (10'-10'-20' SKIP) WITH W/R RPMS @ 40' C.C. (WITH BLACK CONTRAST) (TYP.)
12" WHITE (TYP.)
6" WHITE
6" WHITE (TYP.)
END EDGE STRIPING, MATCH FPID 430444-3 STA. 381+59
6" WHITE (10'-30' SKIP) WITH WHITE/RED RPMS @ 40' O.C. (TYP.)
6" WHITE PERMANENT TAPE (TYP.)
+61.42
6" YELLOW PROFILED THERMOPLASTIC (TYP.)
+43.32
I-195 / SR 112 JULIA TUTTLE CSWY WB
6" YELLOW PERMANENT TAPE (TYP.)
382
383
384
385
386
387
388
+20.33
6" YELLOW PROFILED THERMOPLASTIC (TYP.)
N 64° 48' 22" E
+35.31
℄ CONST. SR 112
+41.30 TYP.
+31.75
I-195 / SR 112 JULIA TUTTLE CSWY EB
6" WHITE (TYP.)
6" WHITE PERMANENT TAPE (TYP.)
6" WHITE
MATCH LINE STA. 381+50.00
MATCH LINE STA. 388+50.00
SPEED LIMIT 35
R2-1 36" X 48" STA. 382+45
700-1-105
[1 AS]
BARRIER MOUNTED SINGLE POST SIGN AT 14' HEIGHT.
SPEED LIMIT 35
EXIST. SIGN (TO REMAIN)
SPEED LIMIT 35
REMOVE EXIST. SIGN
700-1-60
[1 AS]
EMERGENCY STOPPING ONLY
R8-7 48" X 36" STA. 381+65
700-1-105
[1 AS]
BARRIER MOUNTED SINGLE POST SIGN AT 14' HEIGHT.
EXIST. SIGN SUPPORT STRUCTURE (TO BE REMOVED)
700-3-607 1 EA
700-4-620 1 EA
LEGEND
FPID 430444-3-52-01
ALTON RD SOUTH
ALTON RD NORTH
ALTON RD NORTH
END SHOULDER AUTHORIZED BUSES ONLY MON-FRI 7AM-11AM 3PM-7PM
GS-2 60" X 18"
GS-1 60" X 69"
STA 387+45
700-1-105
[1 AS]
BARRIER MOUNTED SINGLE POST SIGN AT 14' HEIGHT.
SPEED LIMIT 30
REMOVE EXIST. SIGN
700-1-60
[1 AS]
SPEED LIMIT 30
EXIST. SIGN (TO REMAIN)
SPEED LIMIT 30
R2-1 * 36" X 48" STA. 387+80
700-1-105
* [1 AS]
BARRIER MOUNTED SINGLE POST SIGN AT 14' HEIGHT.

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

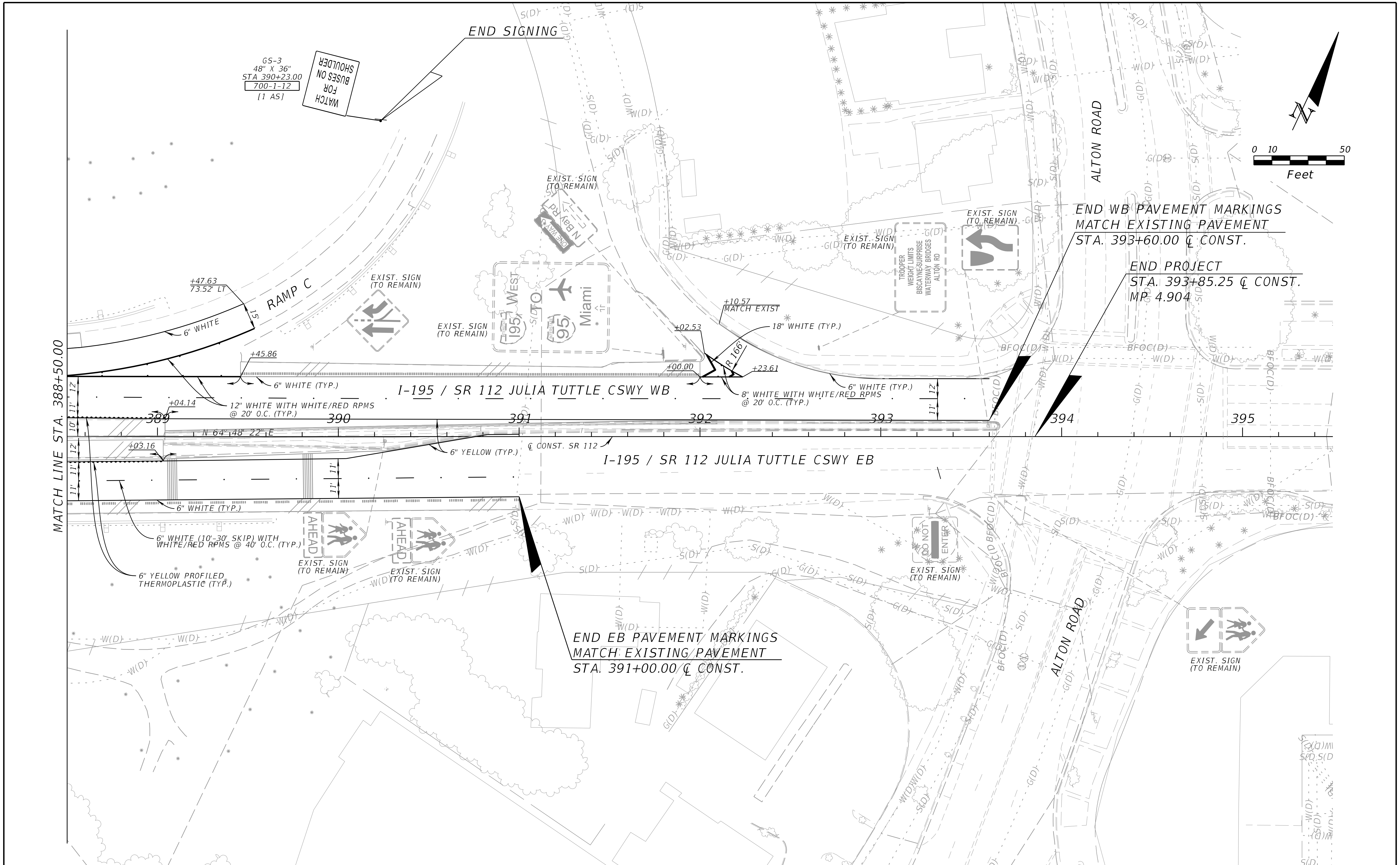
GABRIELA P. RAMIREZ, P.E.
P.E. LICENSE NUMBER 79620
KIMLEY-HORN AND ASSOCIATES, INC.
355 ALHAMBRA CIRCLE, SUITE 1400
MIAMI, FLORIDA 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO.
S-30



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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GABRIELA P. RAMIREZ, P.E.
P.E. LICENSE NUMBER 79620
KIMLEY-HORN AND ASSOCIATES, INC.
355 ALHAMBRA CIRCLE, SUITE 1400
MIAMI, FLORIDA 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 112	MIAMI-DADE	444622-1-52-01

SIGNING AND PAVEMENT MARKING PLAN

SHEET NO. S-31

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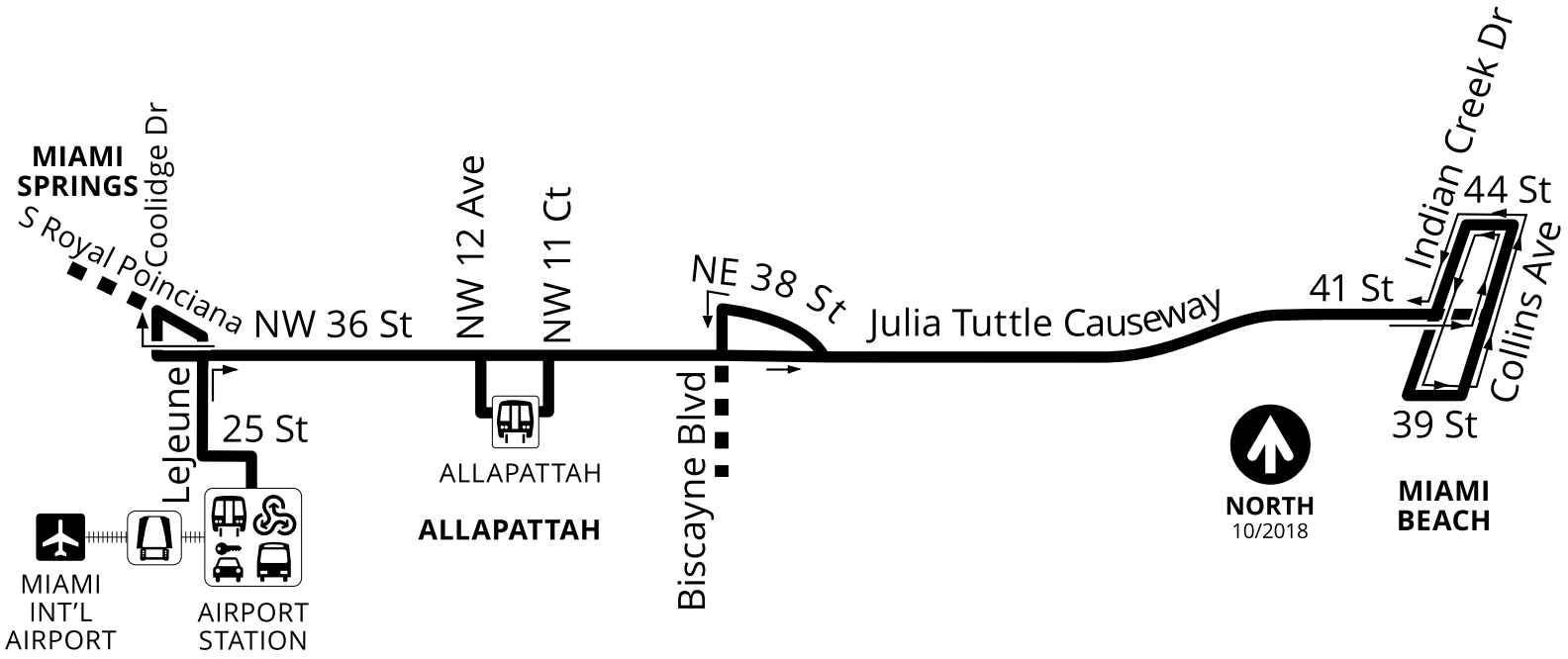
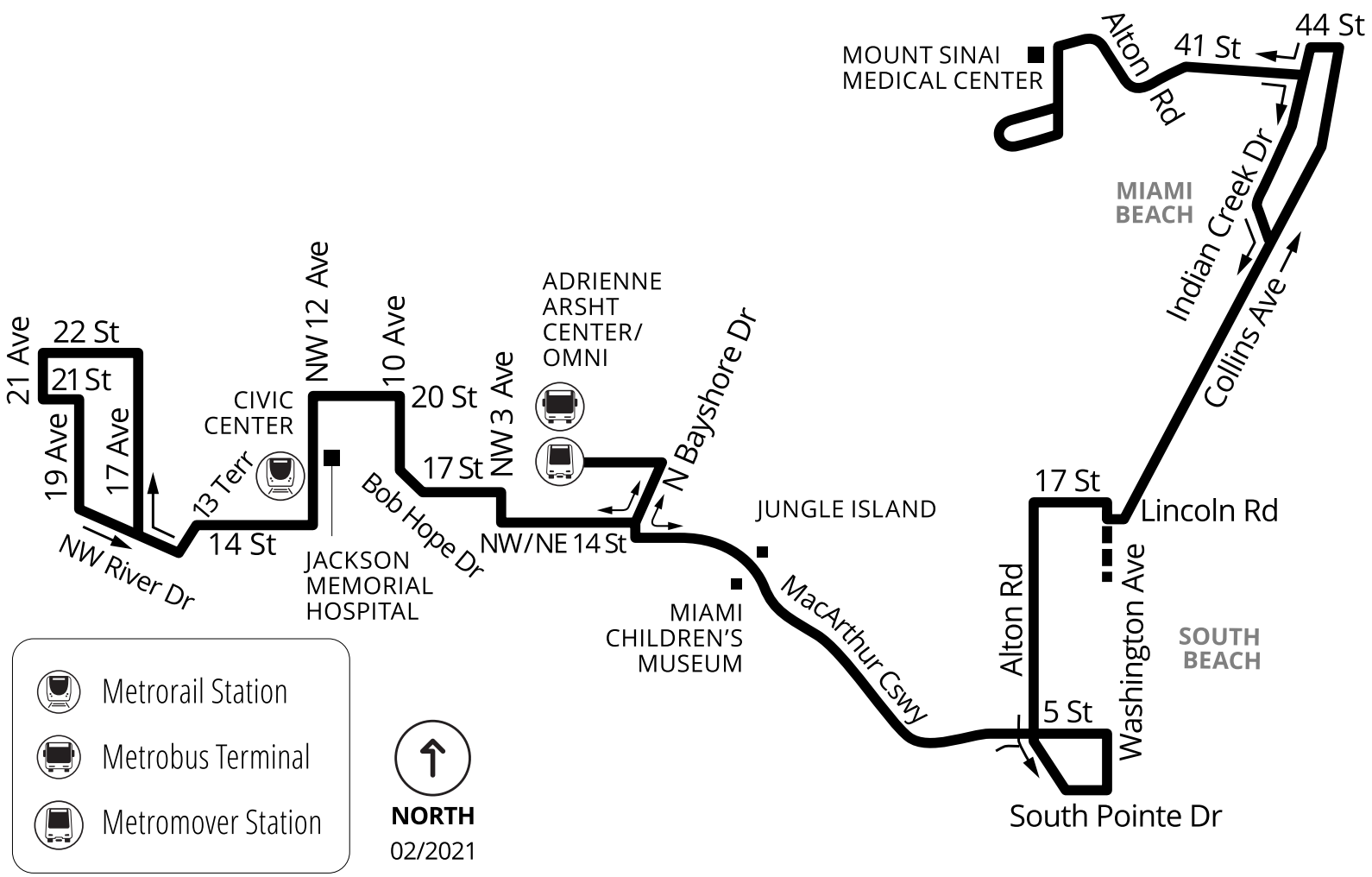


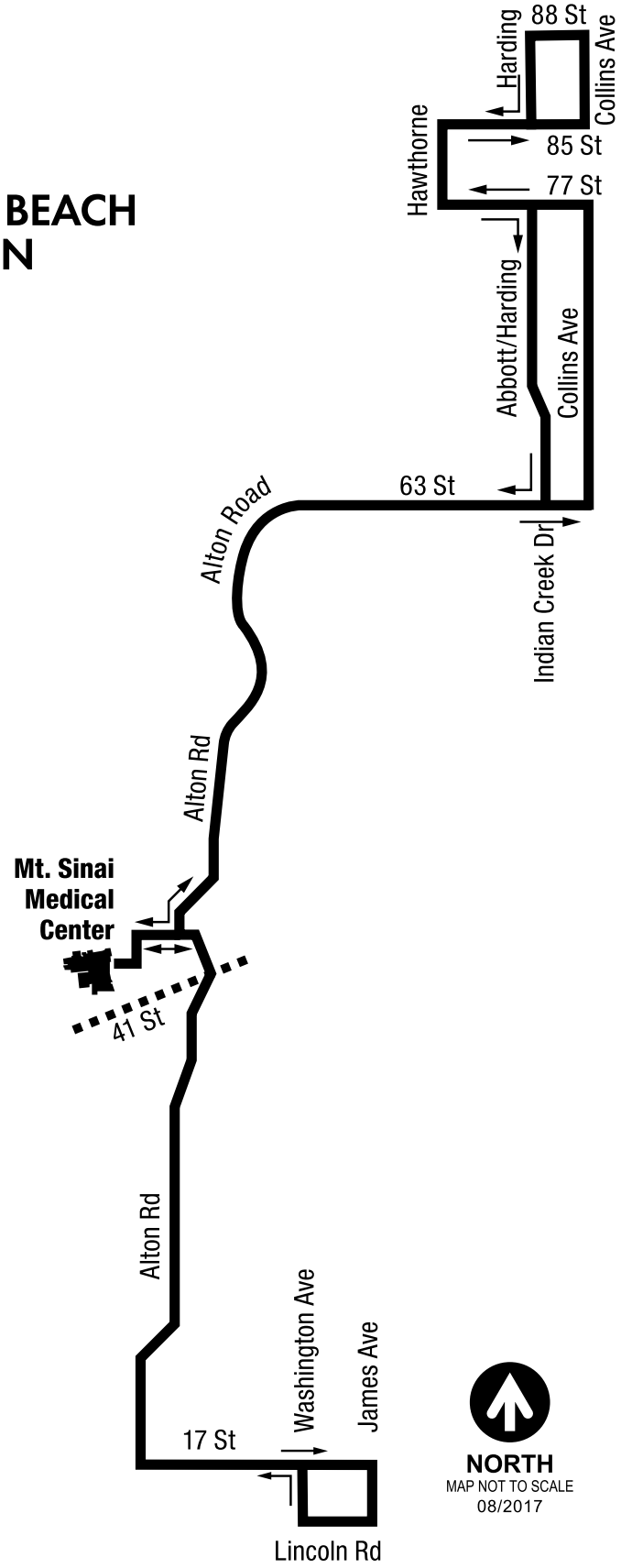
METRORAIL STATION
METROBUS TERMINAL
TRI-RAIL STATION
RENTAL CAR FACILITY
MIA MOVER
AIRPORT

M 113 ON GPS APPS



115

MID-NORTH BEACH CONNECTION



@GoMiamiDade GO Miami-Dade Transit

miamidade.gov/transit 311 or 305.468.5900 TTY/Fla Relay: 711

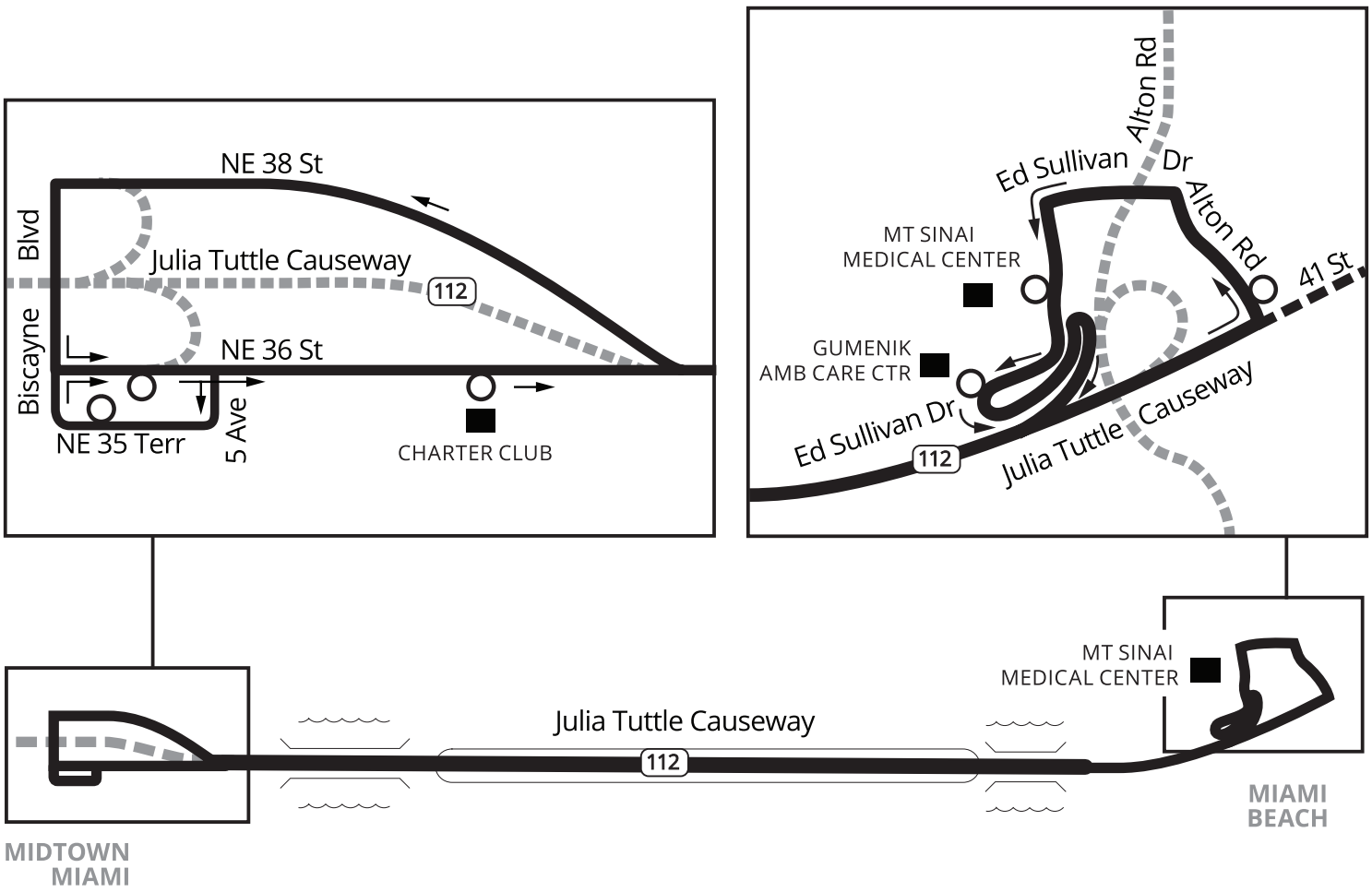
02.2021

MIAMI-DADE COUNTY

241
TUTTLE LIMITED

LIMITED STOPS
entire route

NORTH
12/2021



MIDDLE BEACH LOOP

APPENDIX E
INTERSECTION VOLUME SPREADSHEETS

AM PEAK HOUR TRAFFIC VOLUME CALCULATIONS
MSMC CANCER CENTER

Intersection	Scenario	Traffic Volumes											
		EBLT	EBT	EBRT	WBLT	WBT	WBRT	NBLT	NBT	NBRT	SBLT	SBT	SBRT
Alton Road & 47th Street	Traffic Count	11	10	6	19	6	23	23	1,131	37	50	1,539	4
	Peak Season Conversion Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
	2022 Peak Season Traffic	**11**	**10**	**6**	**19**	**6**	**23**	**23**	**1,154**	**38**	**51**	**1,570**	**4**
	Compound Growth Rate	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%
	Existing plus Background Growth	12	11	6	20	6	24	24	1,202	39	53	1,635	4
	Committed Development Trips												
	2025 Background Traffic	**12**	**11**	**6**	**20**	**6**	**24**	**24**	**1,202**	**39**	**53**	**1,635**	**4**
	In/Out								Out			In	
	Project Assignment								26%			26%	
	Net New Project Trips	0	0	0	0	0	0	0	14	0	0	27	0
	2025 Total Traffic	**12**	**11**	**6**	**20**	**6**	**24**	**24**	**1,216**	**39**	**53**	**1,662**	**4**
Alton Road & 43rd Street	Traffic Count	38	27	136	6	136	189	550	1,031	27	77	1,331	165
	Peak Season Conversion Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
	2022 Peak Season Traffic	**39**	**28**	**139**	**6**	**139**	**193**	**561**	**1,052**	**28**	**79**	**1,358**	**168**
	Compound Growth Rate	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%
	Existing plus Background Growth	40	29	144	6	144	201	584	1,095	29	82	1,414	175
	Committed Development Trips												
	2025 Background Traffic	**40**	**29**	**144**	**6**	**144**	**201**	**584**	**1,095**	**29**	**82**	**1,414**	**175**
	In/Out	Out	Out	Out		In		In					In
	Project Assignment	26%	6%	24%		6%		68%					26%
	Net New Project Trips	14	3	12	0	6	0	71	0	0	0	0	27
	2025 Total Traffic	**54**	**32**	**156**	**6**	**150**	**201**	**655**	**1,095**	**29**	**82**	**1,414**	**202**
Alton Road & 41st Street	Traffic Count	234	1,216	93	34	914	53	116	121	37	41	100	110
	Peak Season Conversion Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
	2022 Peak Season Traffic	**239**	**1,240**	**95**	**35**	**932**	**54**	**118**	**123**	**38**	**42**	**102**	**112**
	Compound Growth Rate	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%
	Existing plus Background Growth	249	1,292	99	36	971	56	123	129	39	44	106	117
	Committed Development Trips												
	2025 Background Traffic	**249**	**1,292**	**99**	**36**	**971**	**56**	**123**	**129**	**39**	**44**	**106**	**117**
	In/Out						In				Out		
	Project Assignment						6%				6%		
	Net New Project Trips	0	0	0	0	0	6	0	0	0	3	0	0
	2025 Total Traffic	**249**	**1,292**	**99**	**36**	**971**	**62**	**123**	**129**	**39**	**47**	**106**	**117**
Alton Road & Chase Avenue	Traffic Count	88	32	9	58	0	141	0	890	69	5	1,618	0
	Peak Season Conversion Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
	2022 Peak Season Traffic	**90**	**33**	**9**	**59**	**0**	**144**	**0**	**908**	**70**	**5**	**1,650**	**0**
	Compound Growth Rate	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%
	Existing plus Background Growth	93	34	10	62	0	150	0	946	73	5	1,719	0
	Committed Development Trips												
	2025 Background Traffic	**93**	**34**	**10**	**62**	**0**	**150**	**0**	**946**	**73**	**5**	**1,719**	**0**
	In/Out								In			Out	
	Project Assignment								24%			24%	
	Net New Project Trips	0	0	0	0	0	0	0	25	0	0	12	0
	2025 Total Traffic	**93**	**34**	**10**	**62**	**0**	**150**	**0**	**971**	**73**	**5**	**1,731**	**0**

PM PEAK HOUR TRAFFIC VOLUME CALCULATIONS
MSMC CANCER CENTER

Intersection	Scenario	Traffic Volumes											
		EBLT	EBT	EBRT	WBLT	WBT	WBRT	NBLT	NBT	NBRT	SBLT	SBT	SBRT
Alton Road & 47th Street	Traffic Count	17	15	5	20	10	28	9	1,376	30	80	1,002	3
	Peak Season Conversion Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
	2022 Peak Season Traffic	**17**	**15**	**5**	**20**	**10**	**29**	**9**	**1,404**	**31**	**82**	**1,022**	**3**
	Compound Growth Rate	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%
	Existing plus Background Growth	18	16	5	21	11	30	10	1,462	32	85	1,065	3
	Committed Development Trips												
	2025 Background Traffic	**18**	**16**	**5**	**21**	**11**	**30**	**10**	**1,462**	**32**	**85**	**1,065**	**3**
	In/Out								Out			In	
	Project Assignment								26%			26%	
	Net New Project Trips	0	0	0	0	0	0	0	28	0	0	15	0
	2025 Total Traffic	**18**	**16**	**5**	**21**	**11**	**30**	**10**	**1,490**	**32**	**85**	**1,080**	**3**
Alton Road & 43rd Street	Traffic Count	113	62	133	14	46	158	96	1,173	52	67	899	38
	Peak Season Conversion Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
	2022 Peak Season Traffic	**115**	**63**	**136**	**14**	**47**	**161**	**98**	**1,196**	**53**	**68**	**917**	**39**
	Compound Growth Rate	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%
	Existing plus Background Growth	120	66	141	15	49	168	102	1,246	55	71	955	40
	Committed Development Trips												
	2025 Background Traffic	**120**	**66**	**141**	**15**	**49**	**168**	**102**	**1,246**	**55**	**71**	**955**	**40**
	In/Out	Out	Out	Out		In		In					In
	Project Assignment	26%	6%	24%		6%		68%					26%
	Net New Project Trips	28	6	25	0	3	0	39	0	0	0	0	15
	2025 Total Traffic	**148**	**72**	**166**	**15**	**52**	**168**	**141**	**1,246**	**55**	**71**	**955**	**55**
Alton Road & 41st Street	Traffic Count	133	1,228	33	13	1,449	36	224	93	55	60	69	314
	Peak Season Conversion Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
	2022 Peak Season Traffic	**136**	**1,253**	**34**	**13**	**1,478**	**37**	**228**	**95**	**56**	**61**	**70**	**320**
	Compound Growth Rate	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%
	Existing plus Background Growth	141	1,305	35	14	1,539	38	238	99	58	64	73	334
	Committed Development Trips												
	2025 Background Traffic	**141**	**1,305**	**35**	**14**	**1,539**	**38**	**238**	**99**	**58**	**64**	**73**	**334**
	In/Out						In				Out		
	Project Assignment						6%				6%		
	Net New Project Trips	0	0	0	0	0	3	0	0	0	6	0	0
	2025 Total Traffic	**141**	**1,305**	**35**	**14**	**1,539**	**41**	**238**	**99**	**58**	**70**	**73**	**334**
Alton Road & Chase Avenue	Traffic Count	188	10	2	30	0	217	0	1,664	25	3	1,626	0
	Peak Season Conversion Factor	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
	2022 Peak Season Traffic	**192**	**10**	**2**	**31**	**0**	**221**	**0**	**1,697**	**26**	**3**	**1,659**	**0**
	Compound Growth Rate	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%	1.37%
	Existing plus Background Growth	200	11	2	32	0	231	0	1,768	27	3	1,727	0
	Committed Development Trips												
	2025 Background Traffic	**200**	**11**	**2**	**32**	**0**	**231**	**0**	**1,768**	**27**	**3**	**1,727**	**0**
	In/Out								In			Out	
	Project Assignment								24%			24%	
	Net New Project Trips	0	0	0	0	0	0	0	14	0	0	25	0
	2025 Total Traffic	**200**	**11**	**2**	**32**	**0**	**231**	**0**	**1,782**	**27**	**3**	**1,752**	**0**

APPENDIX F
INTERSECTION CAPACITY REPORTS

EXISTING CONDITIONS

Table 1.1 - 2022 Existing Intersection Capacity Analysis Summary

Location	Time	Level of Service[1]							
		Alton Road & 47th Street		Alton Road & 43rd Street		Alton Road & 41st Street		Alton Road & Chase Avenue	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
EBL	AM	D	48.8	E	69.7	C	30.9	D	43.7
	PM	D	49.0	E	79.6	D	35.3	D	44.2
EBT	AM	A	0.0	E	69.7	C	27.0	D	40.5
	PM	A	0.0	E	79.6	C	20.9	D	35.9
EBR	AM	A	0.0	A	0.1	A	0.0	D	40.5
	PM	A	0.0	A	0.1	A	0.0	D	35.9
EB Approach	AM	D	48.8	C	22.6	C	27.6	D	42.7
	PM	D	49.0	D	45.1	C	22.3	D	43.7
WBL	AM	D	50.1	F	112.1	C	21.2	D	42.9
	PM	D	50.7	E	70.3	B	16.6	D	36.6
WBT	AM	A	0.0	F	112.1	C	26.7	[N/A]	
	PM	A	0.0	E	70.3	C	27.0		
WBR	AM	A	0.0	F	112.1	B	17.3	D	40.8
	PM	A	0.0	E	70.3	B	12.0	D	51.4
WB Approach	AM	D	50.1	F	112.1	C	16.0	D	41.4
	PM	D	50.7	E	70.3	C	26.5	D	49.6
NBL	AM	A	7.0	E	74.8	D	47.8	[N/A]	
	PM	A	4.4	E	67.4	F	126.0		
NBT	AM	A	7.4	B	14.6	A	0.0	A	4.2
	PM	A	9.2	B	15.7	A	0.0	B	10.9
NBR	AM	A	7.3	A	5.1	D	45.7	A	3.0
	PM	A	9.1	B	6.0	E	63.5	A	4.7
NB Approach	AM	A	7.4	D	35.0	D	46.8	A	4.1
	PM	A	9.1	B	19.1	F	101.1	B	10.8
SBL	AM	A	4.3	C	17.7	D	36.5	A	7.4
	PM	A	6.3	B	11.6	D	48.5	B	11.4
SBT	AM	A	4.7	D	39.1	C	34.8	A	7.4
	PM	A	3.3	B	16.9	D	45.1	B	11.4
SBR	AM	A	4.6	B	17.2	D	35.8	[N/A]	
	PM	A	3.2	A	7.8	E	66.9		
SB Approach	AM	A	4.7	D	35.8	D	35.5	A	7.4
	PM	A	3.5	B	16.2	E	61.0	B	11.4
Overall	AM	A	6.9	D	37.7	C	29.5	B	10.2
	PM	A	8.3	C	22.1	D	36.6	B	15.3

[1] Delay is average delay per vehicle in seconds

[2] Approach operates under Free-flow conditions

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ENGINEERING & ENVIRONMENTAL SERVICES

Table 1.2 -2022 Existing Intersection Queue Lengths Summary

Location	Time	95th Percentile Queue Lenghts (ft)															
		EBL		EBR		WBL		WBR		NBL		NBR		SBL		SBR	
		Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile
Alton Road & 47th Street	AM									55	17			115	14		
	PM										8				22		
Alton Road & 43rd Street	AM									315	#414	50	0	130	38	75	41
	PM										83		8		34		0
Alton Road & 41st Street	AM	285	#205			120	28	95	13					175	57		
	PM		#148				13		5						93		
Alton Road & Chase Avenue	AM	75	108			50	78					45	17				
	PM		197				45						8				

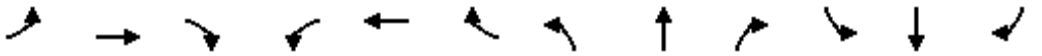
 # 95th percentile volume exceeds capacity, queue may be longer.

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	11	10	19	6	23	1154	51	1570
Future Volume (vph)	11	10	19	6	23	1154	51	1570
Lane Group Flow (vph)	0	29	0	50	24	1255	54	1657
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0
Minimum Split (s)	25.0	25.0	25.0	25.0	24.0	24.0	11.0	24.0
Total Split (s)	26.0	26.0	26.0	26.0	80.0	80.0	14.0	94.0
Total Split (%)	21.7%	21.7%	21.7%	21.7%	66.7%	66.7%	11.7%	78.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0		7.0	6.0	6.0	6.0	6.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Max	Max	None	Max
v/c Ratio		0.25		0.39	0.12	0.46	0.16	0.55
Control Delay		45.9		38.7	7.3	7.1	3.2	4.2
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		45.9		38.7	7.3	7.1	3.2	4.2
Queue Length 50th (ft)		15		17	5	177	5	159
Queue Length 95th (ft)		45		56	17	257	14	243
Internal Link Dist (ft)		184		729		2939		486
Turn Bay Length (ft)					55		115	
Base Capacity (vph)		265		275	205	2702	383	3002
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		0.11		0.18	0.12	0.46	0.14	0.55

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 111.3
Natural Cycle: 65
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Alton Road & 47th Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	10	6	19	6	23	23	1154	38	51	1570	4
Future Volume (veh/h)	11	10	6	19	6	23	23	1154	38	51	1570	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	11	6	20	6	24	24	1215	40	54	1653	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	52	21	75	20	45	268	2551	84	391	2982	7
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.06	0.73	0.73	0.73	0.04	0.82	0.82
Sat Flow, veh/h	462	884	351	481	343	761	301	3511	116	1781	3637	9
Grp Volume(v), veh/h	29	0	0	50	0	0	24	615	640	54	807	850
Grp Sat Flow(s),veh/h/ln	1697	0	0	1584	0	0	301	1777	1850	1781	1777	1869
Q Serve(g_s), s	0.0	0.0	0.0	1.5	0.0	0.0	3.1	15.5	15.5	0.7	16.1	16.1
Cycle Q Clear(g_c), s	1.7	0.0	0.0	3.2	0.0	0.0	9.2	15.5	15.5	0.7	16.1	16.1
Prop In Lane	0.41		0.21	0.40		0.48	1.00		0.06	1.00		0.00
Lane Grp Cap(c), veh/h	148	0	0	140	0	0	268	1291	1344	391	1457	1532
V/C Ratio(X)	0.20	0.00	0.00	0.36	0.00	0.00	0.09	0.48	0.48	0.14	0.55	0.55
Avail Cap(c_a), veh/h	334	0	0	321	0	0	268	1291	1344	457	1457	1532
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.3	0.0	0.0	49.0	0.0	0.0	6.4	6.1	6.1	4.2	3.2	3.2
Incr Delay (d2), s/veh	0.5	0.0	0.0	1.1	0.0	0.0	0.7	1.3	1.2	0.1	1.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	1.3	0.0	0.0	0.2	5.4	5.6	0.2	4.3	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.8	0.0	0.0	50.1	0.0	0.0	7.0	7.4	7.3	4.3	4.7	4.6
LnGrp LOS	D	A	A	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h		29			50			1279			1711	
Approach Delay, s/veh		48.8			50.1			7.4			4.7	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.0	84.0		13.3		94.0		13.3				
Change Period (Y+Rc), s	6.0	6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s	8.0	74.0		19.0		88.0		19.0				
Max Q Clear Time (g_c+I1), s	2.7	17.5		3.7		18.1		5.2				
Green Ext Time (p_c), s	0.0	3.7		0.0		5.1		0.1				

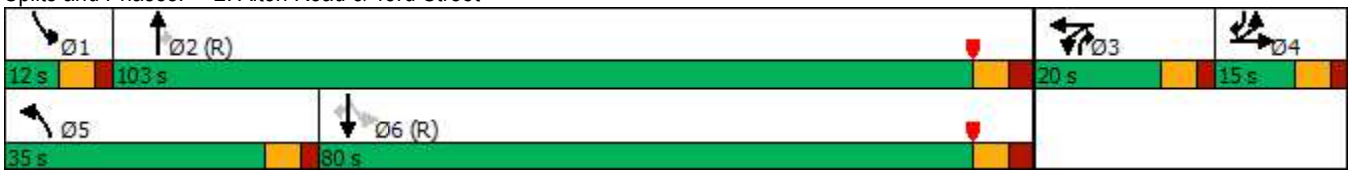
Intersection Summary												
HCM 6th Ctrl Delay			6.9									
HCM 6th LOS			A									

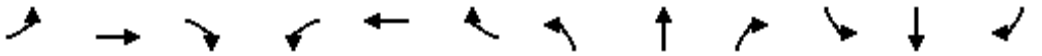
Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	28	139	139	561	1052	28	79	1358	168
Future Volume (vph)	28	139	139	561	1052	28	79	1358	168
Lane Group Flow (vph)	72	151	158	610	1143	30	86	1476	183
Turn Type	NA	Free	NA	Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4		3	5	2	3	1	6	4
Permitted Phases		Free				2	6		6
Detector Phase	4		3	5	2	3	1	6	4
Switch Phase									
Minimum Initial (s)	7.0		7.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	24.0		24.0	11.0	25.0	24.0	11.0	25.0	24.0
Total Split (s)	15.0		20.0	35.0	103.0	20.0	12.0	80.0	15.0
Total Split (%)	10.0%		13.3%	23.3%	68.7%	13.3%	8.0%	53.3%	10.0%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	7.0	6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None		None	None	C-Max	None	None	C-Max	None
v/c Ratio	0.39	0.10	0.91	0.90	0.50	0.02	0.29	0.85	0.20
Control Delay	74.8	0.1	115.1	75.9	14.8	0.0	12.0	39.7	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.8	0.1	115.1	75.9	14.8	0.0	12.0	39.7	4.1
Queue Length 50th (ft)	36	0	156	302	293	0	21	657	20
Queue Length 95th (ft)	64	0	#297	#414	349	0	38	764	41
Internal Link Dist (ft)	651		364		2492			2939	
Turn Bay Length (ft)				315		50	130		75
Base Capacity (vph)	206	1583	173	677	2290	1260	300	1730	928
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	0.35	0.10	0.91	0.90	0.50	0.02	0.29	0.85	0.20

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow
Natural Cycle: 145
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Alton Road & 43rd Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	28	139	6	139	0	561	1052	28	79	1358	168
Future Volume (vph)	39	28	139	6	139	0	561	1052	28	79	1358	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0		6.0		6.0	7.0	6.0	6.0	7.0	6.0
Lane Util. Factor		0.95	1.00		1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00		1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3439	1583		1859		3433	3539	1583	1770	3539	1583
Flt Permitted		0.97	1.00		1.00		0.95	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)		3439	1583		1859		3433	3539	1583	463	3539	1583
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
Adj. Flow (vph)	42	30	151	7	151	0	610	1143	30	86	1476	183
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	8	0	0	50
Lane Group Flow (vph)	0	72	151	0	158	0	610	1143	22	86	1476	133
Turn Type	Split	NA	Free	Split	NA		Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4	4		3	3		5	2	3	1	6	4
Permitted Phases			Free						2	6		6
Actuated Green, G (s)		8.0	150.0		14.0		29.6	97.1	111.1	79.3	73.4	81.4
Effective Green, g (s)		8.0	150.0		14.0		29.6	97.1	111.1	79.3	73.4	81.4
Actuated g/C Ratio		0.05	1.00		0.09		0.20	0.65	0.74	0.53	0.49	0.54
Clearance Time (s)		6.0			6.0		6.0	7.0	6.0	6.0	7.0	6.0
Vehicle Extension (s)		2.5			3.5		5.0	1.0	3.5	2.0	1.0	2.5
Lane Grp Cap (vph)		183	1583		173		677	2290	1172	296	1731	859
v/s Ratio Prot		c0.02			c0.09		c0.18	0.32	0.00	0.01	c0.42	0.01
v/s Ratio Perm			0.10						0.01	0.14		0.08
v/c Ratio		0.39	0.10		0.91		0.90	0.50	0.02	0.29	0.85	0.16
Uniform Delay, d1		68.7	0.0		67.4		58.8	13.8	5.1	17.5	33.6	17.1
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.0	0.1		44.7		16.0	0.8	0.0	0.2	5.6	0.1
Delay (s)		69.7	0.1		112.1		74.8	14.6	5.1	17.7	39.1	17.2
Level of Service		E	A		F		E	B	A	B	D	B
Approach Delay (s)		22.6			112.1			35.0			35.8	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

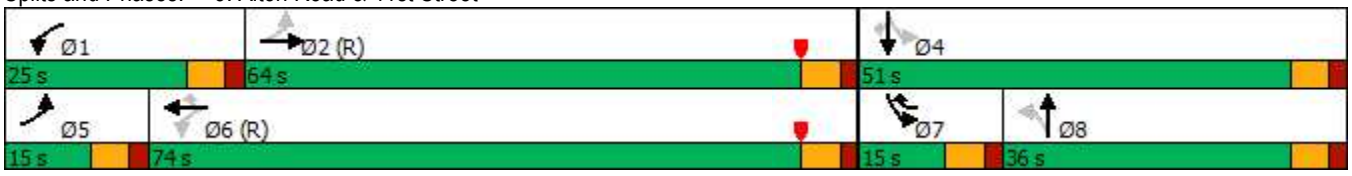
c Critical Lane Group

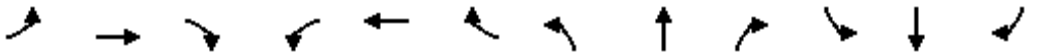
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	239	1240	35	932	54	118	123	42	102	112
Future Volume (vph)	239	1240	35	932	54	118	123	42	102	112
Lane Group Flow (vph)	246	1376	36	961	56	0	288	43	105	115
Turn Type	pm+pt	NA	pm+pt	NA	pm+ov	Perm	NA	pm+pt	NA	Perm
Protected Phases	5	2	1	6	7		8	7	4	
Permitted Phases	2		6		6	8		4		4
Detector Phase	5	2	1	6	7	8	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	11.0	24.0	11.0	24.0	11.0	24.0	24.0	11.0	24.0	24.0
Total Split (s)	15.0	64.0	25.0	74.0	15.0	36.0	36.0	15.0	51.0	51.0
Total Split (%)	10.7%	45.7%	17.9%	52.9%	10.7%	25.7%	25.7%	10.7%	36.4%	36.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	C-Max	None	Max	Max	None	Max	Max
v/c Ratio	0.85	0.75	0.23	0.56	0.06		0.43	0.14	0.18	0.20
Control Delay	43.0	29.8	15.9	27.0	1.9		46.3	34.4	35.2	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	43.0	29.8	15.9	27.0	1.9		46.3	34.4	35.2	6.3
Queue Length 50th (ft)	101	516	13	318	0		114	27	69	0
Queue Length 95th (ft)	#205	623	28	383	13		166	57	116	43
Internal Link Dist (ft)		473		798			261		301	
Turn Bay Length (ft)	285		120		95			175		
Base Capacity (vph)	290	1838	317	1718	966		673	323	598	588
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	0.85	0.75	0.11	0.56	0.06		0.43	0.13	0.18	0.20

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 103 (74%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Alton Road & 41st Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	239	1240	95	35	932	54	118	123	38	42	102	112
Future Volume (veh/h)	239	1240	95	35	932	54	118	123	38	42	102	112
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	246	1278	0	36	961	56	122	127	39	43	105	115
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	330	1859		210	1726	816	306	346	109	318	601	509
Arrive On Green	0.06	0.52	0.00	0.03	0.49	0.49	0.25	0.25	0.25	0.03	0.32	0.32
Sat Flow, veh/h	1781	3647	0	1781	3554	1585	1036	1386	438	1781	1870	1585
Grp Volume(v), veh/h	246	1278	0	36	961	56	143	0	145	43	105	115
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1585	1237	0	1623	1781	1870	1585
Q Serve(g_s), s	9.0	37.5	0.0	1.4	26.7	2.5	13.3	0.0	10.3	2.4	5.7	7.4
Cycle Q Clear(g_c), s	9.0	37.5	0.0	1.4	26.7	2.5	13.7	0.0	10.3	2.4	5.7	7.4
Prop In Lane	1.00		0.00	1.00		1.00	0.85		0.27	1.00		1.00
Lane Grp Cap(c), veh/h	330	1859		210	1726	816	356	0	405	318	601	509
V/C Ratio(X)	0.75	0.69		0.17	0.56	0.07	0.40	0.00	0.36	0.14	0.17	0.23
Avail Cap(c_a), veh/h	330	1859		404	1726	816	356	0	405	381	601	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.9	24.9	0.0	21.0	25.4	17.1	44.5	0.0	43.3	36.4	34.1	34.8
Incr Delay (d2), s/veh	8.0	2.1	0.0	0.1	1.3	0.2	3.4	0.0	2.4	0.1	0.6	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	16.2	0.0	0.6	11.6	1.0	4.6	0.0	4.4	1.1	2.7	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	27.0	0.0	21.2	26.7	17.3	47.8	0.0	45.7	36.5	34.8	35.8
LnGrp LOS	C	C		C	C	B	D	A	D	D	C	D
Approach Vol, veh/h		1524	A		1053			288			263	
Approach Delay, s/veh		27.6			26.0			46.8			35.5	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	79.2		51.0	15.0	74.0	10.1	40.9				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	19.0	58.0		45.0	9.0	68.0	9.0	30.0				
Max Q Clear Time (g_c+I1), s	3.4	39.5		9.4	11.0	28.7	4.4	15.7				
Green Ext Time (p_c), s	0.0	3.9		0.8	0.0	2.9	0.0	1.2				

Intersection Summary			
HCM 6th Ctrl Delay		29.5	
HCM 6th LOS		C	

Notes

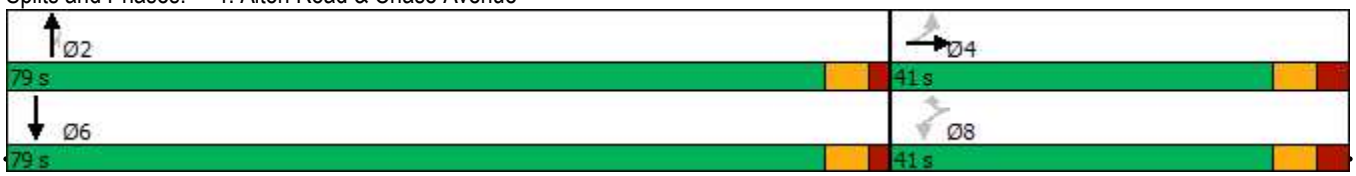
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

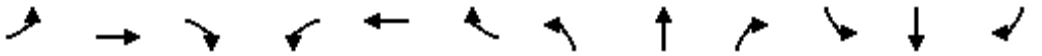
Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBT
Lane Configurations							
Traffic Volume (vph)	90	33	59	144	908	70	1650
Future Volume (vph)	90	33	59	144	908	70	1650
Lane Group Flow (vph)	97	45	63	155	976	75	1779
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4			2		6
Permitted Phases	4		8	8		2	
Detector Phase	4	4	8	8	2	2	6
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	41.0	41.0	41.0	41.0	79.0	79.0	79.0
Total Split (%)	34.2%	34.2%	34.2%	34.2%	65.8%	65.8%	65.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	6.0	6.0	6.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	None	Max	Max	Max
v/c Ratio	0.52	0.23	0.44	0.55	0.36	0.06	1.48
Control Delay	51.2	34.9	50.3	18.2	4.5	2.2	240.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	34.9	50.3	18.2	4.5	2.2	240.4
Queue Length 50th (ft)	57	20	37	14	84	5	~795
Queue Length 95th (ft)	108	53	78	72	132	17	#985
Internal Link Dist (ft)		300			1048		2492
Turn Bay Length (ft)	75		50			45	
Base Capacity (vph)	613	630	469	634	2699	1216	1199
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.07	0.13	0.24	0.36	0.06	1.48

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 98.2
Natural Cycle: 150
Control Type: Semi Act-Uncoord
~ 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.

Splits and Phases: 4: Alton Road & Chase Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	33	9	59	0	144	0	908	70	5	1650	0
Future Volume (vph)	90	33	9	59	0	144	0	908	70	5	1650	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0		7.0		6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00		1.00		0.95	1.00		0.95	
Frt	1.00	0.97		1.00		0.85		1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)	1770	1801		1770		1583		3539	1583		3539	
Flt Permitted	0.95	1.00		0.73		1.00		1.00	1.00		0.95	
Satd. Flow (perm)	1770	1801		1356		1583		3539	1583		3372	
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
Adj. Flow (vph)	97	35	10	63	0	155	0	976	75	5	1774	0
RTOR Reduction (vph)	0	9	0	0	0	117	0	0	9	0	0	0
Lane Group Flow (vph)	97	36	0	63	0	38	0	976	66	0	1779	0
Turn Type	Perm	NA		Perm		Perm		NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)	10.3	10.3		10.3		10.3		74.9	74.9		74.9	
Effective Green, g (s)	10.3	10.3		10.3		10.3		74.9	74.9		74.9	
Actuated g/C Ratio	0.10	0.10		0.10		0.10		0.76	0.76		0.76	
Clearance Time (s)	7.0	7.0		7.0		7.0		6.0	6.0		6.0	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		1.0	1.0		1.0	
Lane Grp Cap (vph)	185	188		142		166		2699	1207		2571	
v/s Ratio Prot		0.02						0.28				
v/s Ratio Perm	c0.05			0.05		0.02			0.04		c0.53	
v/c Ratio	0.52	0.19		0.44		0.23		0.36	0.06		0.69	
Uniform Delay, d1	41.6	40.1		41.3		40.3		3.8	2.9		5.9	
Progression Factor	1.00	1.00		1.00		1.00		1.00	1.00		1.00	
Incremental Delay, d2	2.0	0.4		1.6		0.5		0.4	0.1		1.6	
Delay (s)	43.7	40.5		42.9		40.8		4.2	3.0		7.4	
Level of Service	D	D		D		D		A	A		A	
Approach Delay (s)		42.7			41.4			4.1			7.4	
Approach LOS		D			D			A			A	

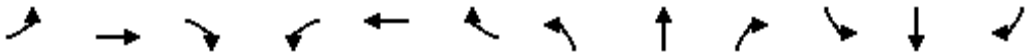
Intersection Summary			
HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	98.2	Sum of lost time (s)	13.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	17	15	20	10	9	1404	82	1022
Future Volume (vph)	17	15	20	10	9	1404	82	1022
Lane Group Flow (vph)	0	39	0	63	9	1511	86	1079
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0
Minimum Split (s)	25.0	25.0	25.0	25.0	24.0	24.0	11.0	24.0
Total Split (s)	26.0	26.0	26.0	26.0	80.0	80.0	14.0	94.0
Total Split (%)	21.7%	21.7%	21.7%	21.7%	66.7%	66.7%	11.7%	78.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0		7.0	6.0	6.0	6.0	6.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Max	Max	None	Max
v/c Ratio		0.31		0.44	0.02	0.57	0.32	0.36
Control Delay		49.5		38.1	6.0	8.9	5.4	3.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		49.5		38.1	6.0	8.9	5.4	3.1
Queue Length 50th (ft)		23		22	2	248	9	81
Queue Length 95th (ft)		57		65	8	365	22	128
Internal Link Dist (ft)		184		729		2939		486
Turn Bay Length (ft)					55		115	
Base Capacity (vph)		283		289	373	2670	304	2981
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		0.14		0.22	0.02	0.57	0.28	0.36

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 109.5
Natural Cycle: 75
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Alton Road & 47th Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	15	5	20	10	29	9	1404	31	82	1022	3
Future Volume (veh/h)	17	15	5	20	10	29	9	1404	31	82	1022	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	18	16	5	21	11	31	9	1478	33	86	1076	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	85	57	14	70	26	49	443	2554	57	323	2971	8
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.06	0.72	0.72	0.72	0.04	0.82	0.82
Sat Flow, veh/h	577	925	221	411	413	798	523	3554	79	1781	3635	10
Grp Volume(v), veh/h	39	0	0	63	0	0	9	738	773	86	526	553
Grp Sat Flow(s),veh/h/ln	1722	0	0	1621	0	0	523	1777	1856	1781	1777	1869
Q Serve(g_s), s	0.0	0.0	0.0	1.8	0.0	0.0	0.5	21.5	21.6	1.2	8.3	8.3
Cycle Q Clear(g_c), s	2.2	0.0	0.0	4.0	0.0	0.0	0.5	21.5	21.6	1.2	8.3	8.3
Prop In Lane	0.46		0.13	0.33		0.49	1.00		0.04	1.00		0.01
Lane Grp Cap(c), veh/h	156	0	0	145	0	0	443	1277	1334	323	1452	1527
V/C Ratio(X)	0.25	0.00	0.00	0.43	0.00	0.00	0.02	0.58	0.58	0.27	0.36	0.36
Avail Cap(c_a), veh/h	335	0	0	323	0	0	443	1277	1334	379	1452	1527
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.4	0.0	0.0	49.2	0.0	0.0	4.3	7.3	7.3	6.2	2.6	2.6
Incr Delay (d2), s/veh	0.6	0.0	0.0	1.5	0.0	0.0	0.1	1.9	1.8	0.2	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	1.7	0.0	0.0	0.1	7.6	8.0	0.4	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.0	0.0	0.0	50.7	0.0	0.0	4.4	9.2	9.1	6.3	3.3	3.2
LnGrp LOS	D	A	A	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h		39			63			1520			1165	
Approach Delay, s/veh		49.0			50.7			9.1			3.5	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.6	83.4		13.7		94.0		13.7				
Change Period (Y+Rc), s	6.0	6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s	8.0	74.0		19.0		88.0		19.0				
Max Q Clear Time (g_c+I1), s	3.2	23.6		4.2		10.3		6.0				
Green Ext Time (p_c), s	0.0	4.4		0.1		2.6		0.1				

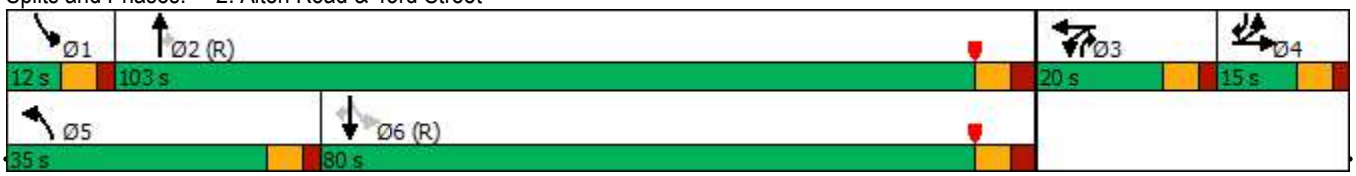
Intersection Summary												
HCM 6th Ctrl Delay			8.3									
HCM 6th LOS			A									

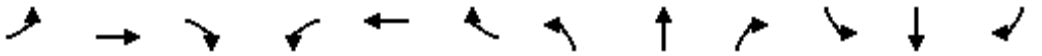
Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	63	136	47	98	1196	53	68	917	39
Future Volume (vph)	63	136	47	98	1196	53	68	917	39
Lane Group Flow (vph)	193	148	66	107	1300	58	74	997	42
Turn Type	NA	Free	NA	Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4		3	5	2	3	1	6	4
Permitted Phases		Free				2	6		6
Detector Phase	4		3	5	2	3	1	6	4
Switch Phase									
Minimum Initial (s)	7.0		7.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	24.0		24.0	11.0	25.0	24.0	11.0	25.0	24.0
Total Split (s)	15.0		20.0	35.0	103.0	20.0	12.0	80.0	15.0
Total Split (%)	10.0%		13.3%	23.3%	68.7%	13.3%	8.0%	53.3%	10.0%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	7.0	6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None		None	None	C-Max	None	None	C-Max	None
v/c Ratio	0.95dl	0.09	0.49	0.39	0.57	0.05	0.29	0.46	0.04
Control Delay	86.5	0.1	78.7	69.3	16.1	0.8	9.4	17.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.5	0.1	78.7	69.3	16.1	0.8	9.4	17.5	0.1
Queue Length 50th (ft)	98	0	63	52	361	0	19	274	0
Queue Length 95th (ft)	#183	0	114	83	422	8	34	343	0
Internal Link Dist (ft)	651		364		2492			2939	
Turn Bay Length (ft)				315		50	130		75
Base Capacity (vph)	254	1583	171	663	2292	1261	262	2145	1121
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	0.76	0.09	0.39	0.16	0.57	0.05	0.28	0.46	0.04

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow
Natural Cycle: 95
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: Alton Road & 43rd Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	63	136	14	47	0	98	1196	53	68	917	39
Future Volume (vph)	115	63	136	14	47	0	98	1196	53	68	917	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0		6.0		6.0	7.0	6.0	6.0	7.0	6.0
Lane Util. Factor		0.95	1.00		1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3428	1583		1842		3433	3539	1583	1770	3539	1583
Flt Permitted		0.97	1.00		0.99		0.95	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)		3428	1583		1842		3433	3539	1583	312	3539	1583
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
Adj. Flow (vph)	125	68	148	15	51	0	107	1300	58	74	997	42
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	16	0	0	13
Lane Group Flow (vph)	0	193	148	0	66	0	107	1300	42	74	997	29
Turn Type	Split	NA	Free	Split	NA		Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4	4		3	3		5	2	3	1	6	4
Permitted Phases			Free						2	6		6
Actuated Green, G (s)		11.2	150.0		10.9		12.0	97.2	108.1	96.6	90.9	102.1
Effective Green, g (s)		11.2	150.0		10.9		12.0	97.2	108.1	96.6	90.9	102.1
Actuated g/C Ratio		0.07	1.00		0.07		0.08	0.65	0.72	0.64	0.61	0.68
Clearance Time (s)		6.0			6.0		6.0	7.0	6.0	6.0	7.0	6.0
Vehicle Extension (s)		2.5			3.5		5.0	1.0	3.5	2.0	1.0	2.5
Lane Grp Cap (vph)		255	1583		133		274	2293	1140	256	2144	1077
v/s Ratio Prot		c0.06			c0.04		c0.03	c0.37	0.00	0.01	0.28	0.00
v/s Ratio Perm			0.09						0.02	0.17		0.02
v/c Ratio		0.95dl	0.09		0.50		0.39	0.57	0.04	0.29	0.47	0.03
Uniform Delay, d1		68.1	0.0		66.9		65.5	14.7	6.0	11.4	16.2	7.8
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		11.5	0.1		3.4		1.9	1.0	0.0	0.2	0.7	0.0
Delay (s)		79.6	0.1		70.3		67.4	15.7	6.0	11.6	16.9	7.8
Level of Service		E	A		E		E	B	A	B	B	A
Approach Delay (s)		45.1			70.3			19.1			16.2	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

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

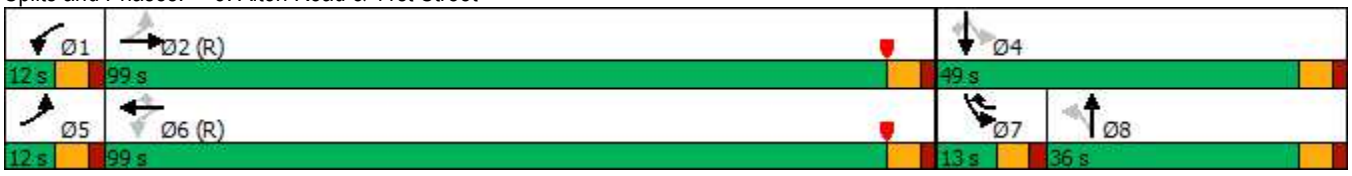
c Critical Lane Group

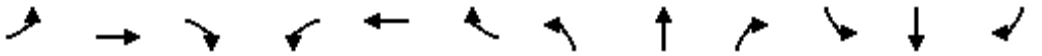
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	136	1253	13	1478	37	228	95	61	70	320
Future Volume (vph)	136	1253	13	1478	37	228	95	61	70	320
Lane Group Flow (vph)	140	1327	13	1524	38	0	391	63	72	330
Turn Type	pm+pt	NA	pm+pt	NA	pm+ov	Perm	NA	pm+pt	NA	Perm
Protected Phases	5	2	1	6	7		8	7	4	
Permitted Phases	2		6		6	8		4		4
Detector Phase	5	2	1	6	7	8	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	11.0	24.0	11.0	24.0	11.0	24.0	24.0	11.0	24.0	24.0
Total Split (s)	12.0	99.0	12.0	99.0	13.0	36.0	36.0	13.0	49.0	49.0
Total Split (%)	7.5%	61.9%	7.5%	61.9%	8.1%	22.5%	22.5%	8.1%	30.6%	30.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	C-Max	None	Max	Max	None	Max	Max
v/c Ratio	0.92	0.60	0.06	0.74	0.04		0.72	0.32	0.14	0.67
Control Delay	74.1	19.8	10.4	27.4	0.7		67.1	48.9	45.5	43.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	74.1	19.8	10.4	27.4	0.7		67.1	48.9	45.5	43.8
Queue Length 50th (ft)	52	380	5	596	0		202	50	58	223
Queue Length 95th (ft)	#148	544	13	686	5		267	93	102	341
Internal Link Dist (ft)		473		798			261		301	
Turn Bay Length (ft)	285		120		95			175		
Base Capacity (vph)	152	2214	214	2057	1069		542	202	500	495
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	0.92	0.60	0.06	0.74	0.04		0.72	0.31	0.14	0.67

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 118 (74%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Alton Road & 41st Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	136	1253	34	13	1478	37	228	95	56	61	70	320
Future Volume (veh/h)	136	1253	34	13	1478	37	228	95	56	61	70	320
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	140	1292	0	13	1524	38	235	98	58	63	72	330
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	2150		231	2066	981	235	194	115	243	503	426
Arrive On Green	0.04	0.61	0.00	0.01	0.58	0.58	0.19	0.19	0.19	0.04	0.27	0.27
Sat Flow, veh/h	1781	3647	0	1781	3554	1585	983	1002	593	1781	1870	1585
Grp Volume(v), veh/h	140	1292	0	13	1524	38	235	0	156	63	72	330
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1585	983	0	1595	1781	1870	1585
Q Serve(g_s), s	5.2	36.1	0.0	0.5	50.3	1.5	31.0	0.0	14.0	4.4	4.7	30.8
Cycle Q Clear(g_c), s	5.2	36.1	0.0	0.5	50.3	1.5	31.0	0.0	14.0	4.4	4.7	30.8
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	200	2150		231	2066	981	235	0	309	243	503	426
V/C Ratio(X)	0.70	0.60		0.06	0.74	0.04	1.00	0.00	0.51	0.26	0.14	0.77
Avail Cap(c_a), veh/h	200	2150		274	2066	981	235	0	309	253	503	426
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.4	19.6	0.0	16.6	24.6	11.9	67.5	0.0	57.7	48.3	44.5	54.0
Incr Delay (d2), s/veh	8.9	1.3	0.0	0.0	2.4	0.1	58.5	0.0	5.8	0.2	0.6	12.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	15.2	0.0	0.2	21.6	0.6	13.6	0.0	6.2	2.0	2.3	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.3	20.9	0.0	16.6	27.0	12.0	126.0	0.0	63.5	48.5	45.1	66.9
LnGrp LOS	D	C		B	C	B	F	A	E	D	D	E
Approach Vol, veh/h		1432	A		1575			391			465	
Approach Delay, s/veh		22.3			26.5			101.1			61.0	
Approach LOS		C			C			F			E	

Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.2	102.8		49.0	12.0	99.0	12.0	37.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	6.0	93.0		43.0	6.0	93.0	7.0	30.0				
Max Q Clear Time (g_c+I1), s	2.5	38.1		32.8	7.2	52.3	6.4	33.0				
Green Ext Time (p_c), s	0.0	4.4		0.9	0.0	5.7	0.0	0.0				

Intersection Summary			
HCM 6th Ctrl Delay		36.6	
HCM 6th LOS		D	

Notes

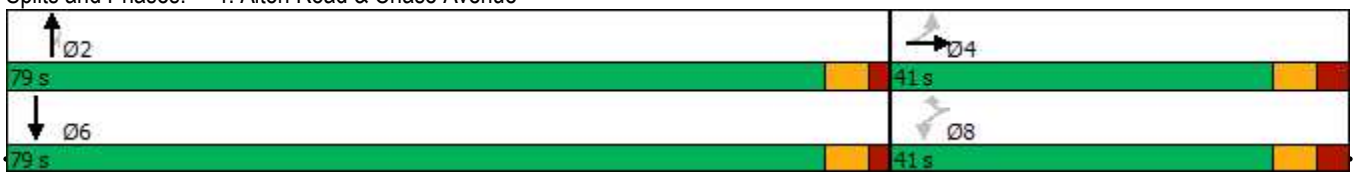
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

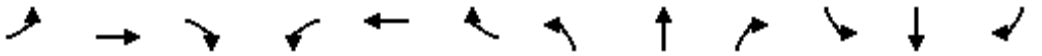
Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBT
Lane Configurations							
Traffic Volume (vph)	192	10	31	221	1697	26	1659
Future Volume (vph)	192	10	31	221	1697	26	1659
Lane Group Flow (vph)	198	12	32	228	1749	27	1713
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4			2		6
Permitted Phases	4		8	8		2	
Detector Phase	4	4	8	8	2	2	6
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	41.0	41.0	41.0	41.0	79.0	79.0	79.0
Total Split (%)	34.2%	34.2%	34.2%	34.2%	65.8%	65.8%	65.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	6.0	6.0	6.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	None	Max	Max	Max
v/c Ratio	0.64	0.04	0.13	0.77	0.70	0.02	1.56
Control Delay	49.8	31.2	36.6	53.1	12.1	1.7	275.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	31.2	36.6	53.1	12.1	1.7	275.4
Queue Length 50th (ft)	124	6	18	129	317	0	~851
Queue Length 95th (ft)	197	22	45	212	519	8	#1096
Internal Link Dist (ft)		300			1048		2492
Turn Bay Length (ft)	75		50			45	
Base Capacity (vph)	578	594	456	535	2481	1120	1100
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.02	0.07	0.43	0.70	0.02	1.56

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 104.4
Natural Cycle: 150
Control Type: Semi Act-Uncoord
~ 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.

Splits and Phases: 4: Alton Road & Chase Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	192	10	2	31	0	221	0	1697	26	3	1659	0
Future Volume (vph)	192	10	2	31	0	221	0	1697	26	3	1659	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0		7.0		6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00		1.00		0.95	1.00		0.95	
Frt	1.00	0.97		1.00		0.85		1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)	1770	1816		1770		1583		3539	1583		3539	
Flt Permitted	0.95	1.00		0.75		1.00		1.00	1.00		0.95	
Satd. Flow (perm)	1770	1816		1397		1583		3539	1583		3369	
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
Adj. Flow (vph)	198	10	2	32	0	228	0	1749	27	3	1710	0
RTOR Reduction (vph)	0	2	0	0	0	22	0	0	8	0	0	0
Lane Group Flow (vph)	198	10	0	32	0	206	0	1749	19	0	1713	0
Turn Type	Perm	NA		Perm		Perm		NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)	18.1	18.1		18.1		18.1		73.2	73.2		73.2	
Effective Green, g (s)	18.1	18.1		18.1		18.1		73.2	73.2		73.2	
Actuated g/C Ratio	0.17	0.17		0.17		0.17		0.70	0.70		0.70	
Clearance Time (s)	7.0	7.0		7.0		7.0		6.0	6.0		6.0	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		1.0	1.0		1.0	
Lane Grp Cap (vph)	307	315		242		274		2483	1110		2364	
v/s Ratio Prot		0.01						0.49				
v/s Ratio Perm	0.11			0.02		c0.13			0.01		c0.51	
v/c Ratio	0.64	0.03		0.13		0.75		0.70	0.02		0.72	
Uniform Delay, d1	40.1	35.8		36.5		41.0		9.2	4.7		9.4	
Progression Factor	1.00	1.00		1.00		1.00		1.00	1.00		1.00	
Incremental Delay, d2	4.1	0.0		0.2		10.5		1.7	0.0		2.0	
Delay (s)	44.2	35.9		36.6		51.4		10.9	4.7		11.4	
Level of Service	D	D		D		D		B	A		B	
Approach Delay (s)		43.7			49.6			10.8			11.4	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	104.3	Sum of lost time (s)	13.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

FUTURE NO BUILD CONDITIONS

Table 2.1 - 2025 No Build Intersection Capacity Analysis Summary

Location	Time	Level of Service[1]							
		Alton Road & 47th Street		Alton Road & 43rd Street		Alton Road & 41st Street		Alton Road & Chase Avenue	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
EBL	AM	D	48.8	E	69.7	D	39.1	D	43.7
	PM	D	49.1	F	81.1	D	46.2	D	44.0
EBT	AM	A	0.0	E	69.7	C	27.9	D	40.3
	PM	A	0.0	F	81.1	C	21.6	D	35.6
EBR	AM	A	0.0	A	0.1	A	0.0	D	40.3
	PM	A	0.0	A	0.1	A	0.0	D	35.6
EB Approach	AM	D	48.8	C	22.6	C	29.7	D	42.9
	PM	D	49.1	D	46.2	C	23.9	D	43.5
WBL	AM	D	50.2	F	120.8	C	21.9	D	42.9
	PM	D	50.9	E	70.3	B	17.2	D	36.4
WBT	AM	A	0.0	F	120.8	C	27.2	[N/A]	
	PM	A	0.0	E	70.3	C	28.2		
WBR	AM	A	0.0	F	120.8	B	17.2	D	41.3
	PM	A	0.0	E	70.3	B	11.9	D	51.8
WB Approach	AM	D	50.2	F	120.8	C	26.5	D	41.8
	PM	D	50.9	E	70.3	C	27.7	D	49.9
NBL	AM	A	7.7	E	78.5	D	48.6	[N/A]	
	PM	A	4.5	E	67.4	F	144.3		
NBT	AM	A	7.7	B	15.0	A	0.0	A	4.3
	PM	A	9.6	B	16.4	A	0.0	B	12.2
NBR	AM	A	7.6	A	5.2	D	46.2	A	3.0
	PM	A	9.6	A	6.1	E	64.6	A	4.9
NB Approach	AM	A	7.7	D	36.5	D	47.3	A	4.2
	PM	A	9.6	B	19.7	F	112.6	B	12.1
SBL	AM	A	4.6	B	18.0	D	36.6	A	8.0
	PM	A	7.0	B	12.4	D	48.7	B	12.7
SBT	AM	A	5.0	D	42.5	C	34.9	A	8.0
	PM	A	3.4	B	17.6	D	45.2	B	12.7
SBR	AM	A	4.9	B	17.4	D	36.0	[N/A]	
	PM	A	3.3	A	7.9	E	69.7		
SB Approach	AM	A	5.0	D	38.6	D	35.7	A	8.0
	PM	A	3.6	B	16.9	E	63.1	B	12.7
Overall	AM	A	7.2	D	40.1	C	30.8	B	10.6
	PM	A	8.6	C	22.8	D	39.2	B	16.5

[1] Delay is average delay per vehicle in seconds

[2] Approach operates under Free-flow conditions

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Table 2.2 -2025 No Build Intersection Queue Lengths Summary

Location	Time	95th Percentile Queue Lenghts (ft)															
		EBL		EBR		WBL		WBR		NBL		NBR		SBL		SBR	
		Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile
Alton Road & 47th Street	AM									55	18			115	15		
	PM										9				23		
Alton Road & 43rd Street	AM									315	#441	50	1	130	40	75	44
	PM										85		9		135		0
Alton Road & 41st Street	AM	285	#241			120	29	95	15					175	59		
	PM		#169				14		6						96		
Alton Road & Chase Avenue	AM	75	111			50	82					45	18				
	PM		205				45						8				

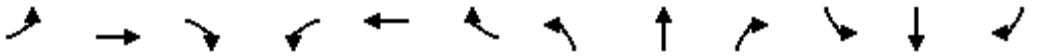
 # 95th percentile volume exceeds capacity, queue may be longer.

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	12	11	20	6	24	1202	53	1635
Future Volume (vph)	12	11	20	6	24	1202	53	1635
Lane Group Flow (vph)	0	31	0	52	25	1306	56	1725
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0
Minimum Split (s)	25.0	25.0	25.0	25.0	24.0	24.0	11.0	24.0
Total Split (s)	26.0	26.0	26.0	26.0	80.0	80.0	14.0	94.0
Total Split (%)	21.7%	21.7%	21.7%	21.7%	66.7%	66.7%	11.7%	78.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0		7.0	6.0	6.0	6.0	6.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Max	Max	None	Max
v/c Ratio		0.27		0.40	0.13	0.48	0.17	0.58
Control Delay		46.8		38.8	7.8	7.4	3.4	4.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		46.8		38.8	7.8	7.4	3.4	4.4
Queue Length 50th (ft)		17		18	5	189	6	173
Queue Length 95th (ft)		48		57	18	275	15	265
Internal Link Dist (ft)		184		729		2939		486
Turn Bay Length (ft)					55		115	
Base Capacity (vph)		265		275	188	2698	366	2999
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		0.12		0.19	0.13	0.48	0.15	0.58

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 111.1
Natural Cycle: 70
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Alton Road & 47th Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	11	6	20	6	24	24	1202	39	53	1635	4
Future Volume (veh/h)	12	11	6	20	6	24	24	1202	39	53	1635	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	13	12	6	21	6	25	25	1265	41	56	1721	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	76	53	20	76	20	46	252	2549	83	375	2980	7
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.06	0.73	0.73	0.73	0.04	0.82	0.82
Sat Flow, veh/h	478	894	329	492	333	763	282	3513	114	1781	3637	8
Grp Volume(v), veh/h	31	0	0	52	0	0	25	639	667	56	841	884
Grp Sat Flow(s),veh/h/ln	1702	0	0	1588	0	0	282	1777	1850	1781	1777	1869
Q Serve(g_s), s	0.0	0.0	0.0	1.5	0.0	0.0	3.6	16.6	16.6	0.8	17.4	17.4
Cycle Q Clear(g_c), s	1.8	0.0	0.0	3.3	0.0	0.0	11.0	16.6	16.6	0.8	17.4	17.4
Prop In Lane	0.42		0.19	0.40		0.48	1.00		0.06	1.00		0.00
Lane Grp Cap(c), veh/h	149	0	0	142	0	0	252	1289	1342	375	1456	1531
V/C Ratio(X)	0.21	0.00	0.00	0.37	0.00	0.00	0.10	0.50	0.50	0.15	0.58	0.58
Avail Cap(c_a), veh/h	334	0	0	321	0	0	252	1289	1342	440	1456	1531
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.3	0.0	0.0	49.0	0.0	0.0	6.9	6.3	6.3	4.5	3.3	3.3
Incr Delay (d2), s/veh	0.5	0.0	0.0	1.2	0.0	0.0	0.8	1.4	1.3	0.1	1.7	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	1.4	0.0	0.0	0.3	5.8	6.0	0.2	4.7	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.8	0.0	0.0	50.2	0.0	0.0	7.7	7.7	7.6	4.6	5.0	4.9
LnGrp LOS	D	A	A	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h		31			52			1331			1781	
Approach Delay, s/veh		48.8			50.2			7.7			5.0	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.1	83.9		13.4		94.0		13.4				
Change Period (Y+Rc), s	6.0	6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s	8.0	74.0		19.0		88.0		19.0				
Max Q Clear Time (g_c+I1), s	2.8	18.6		3.8		19.4		5.3				
Green Ext Time (p_c), s	0.0	4.0		0.1		5.5		0.1				

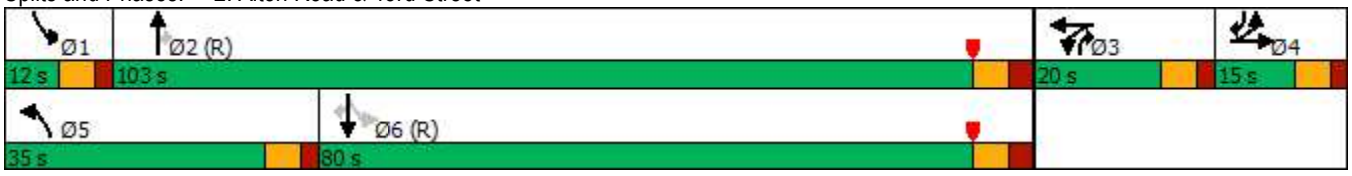
Intersection Summary												
HCM 6th Ctrl Delay			7.2									
HCM 6th LOS			A									

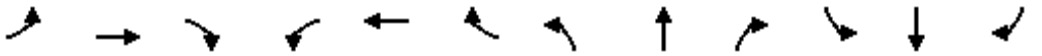
Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	29	144	144	584	1095	29	82	1414	175
Future Volume (vph)	29	144	144	584	1095	29	82	1414	175
Lane Group Flow (vph)	75	157	164	635	1190	32	89	1537	190
Turn Type	NA	Free	NA	Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4		3	5	2	3	1	6	4
Permitted Phases		Free				2	6		6
Detector Phase	4		3	5	2	3	1	6	4
Switch Phase									
Minimum Initial (s)	7.0		7.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	24.0		24.0	11.0	25.0	24.0	11.0	25.0	24.0
Total Split (s)	15.0		20.0	35.0	103.0	20.0	12.0	80.0	15.0
Total Split (%)	10.0%		13.3%	23.3%	68.7%	13.3%	8.0%	53.3%	10.0%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	7.0	6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None		None	None	C-Max	None	None	C-Max	None
v/c Ratio	0.41	0.10	0.95	0.93	0.52	0.03	0.31	0.89	0.21
Control Delay	75.1	0.1	122.3	79.4	15.2	0.1	12.5	42.9	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.1	0.1	122.3	79.4	15.2	0.1	12.5	42.9	4.3
Queue Length 50th (ft)	37	0	162	318	313	0	22	705	21
Queue Length 95th (ft)	67	0	#311	#441	369	1	40	818	44
Internal Link Dist (ft)	651		364		2492			2939	
Turn Bay Length (ft)				315		50	130		75
Base Capacity (vph)	206	1583	173	684	2288	1259	289	1722	924
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	0.36	0.10	0.95	0.93	0.52	0.03	0.31	0.89	0.21

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow
Natural Cycle: 145
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Alton Road & 43rd Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	29	144	6	144	0	584	1095	29	82	1414	175
Future Volume (vph)	40	29	144	6	144	0	584	1095	29	82	1414	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0		6.0		6.0	7.0	6.0	6.0	7.0	6.0
Lane Util. Factor		0.95	1.00		1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00		1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3441	1583		1859		3433	3539	1583	1770	3539	1583
Flt Permitted		0.97	1.00		1.00		0.95	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)		3441	1583		1859		3433	3539	1583	442	3539	1583
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
Adj. Flow (vph)	43	32	157	7	157	0	635	1190	32	89	1537	190
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	8	0	0	50
Lane Group Flow (vph)	0	75	157	0	164	0	635	1190	24	89	1537	140
Turn Type	Split	NA	Free	Split	NA		Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4	4		3	3		5	2	3	1	6	4
Permitted Phases			Free						2	6		6
Actuated Green, G (s)		8.1	150.0		14.0		29.9	97.0	111.0	78.9	73.0	81.1
Effective Green, g (s)		8.1	150.0		14.0		29.9	97.0	111.0	78.9	73.0	81.1
Actuated g/C Ratio		0.05	1.00		0.09		0.20	0.65	0.74	0.53	0.49	0.54
Clearance Time (s)		6.0			6.0		6.0	7.0	6.0	6.0	7.0	6.0
Vehicle Extension (s)		2.5			3.5		5.0	1.0	3.5	2.0	1.0	2.5
Lane Grp Cap (vph)		185	1583		173		684	2288	1171	284	1722	855
v/s Ratio Prot		c0.02			c0.09		c0.18	0.34	0.00	0.01	c0.43	0.01
v/s Ratio Perm			0.10						0.01	0.15		0.08
v/c Ratio		0.41	0.10		0.95		0.93	0.52	0.02	0.31	0.89	0.16
Uniform Delay, d1		68.6	0.0		67.6		59.0	14.1	5.1	17.7	34.9	17.4
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.1	0.1		53.1		19.5	0.8	0.0	0.2	7.5	0.1
Delay (s)		69.7	0.1		120.8		78.5	15.0	5.2	18.0	42.5	17.4
Level of Service		E	A		F		E	B	A	B	D	B
Approach Delay (s)		22.6			120.8			36.5			38.6	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		

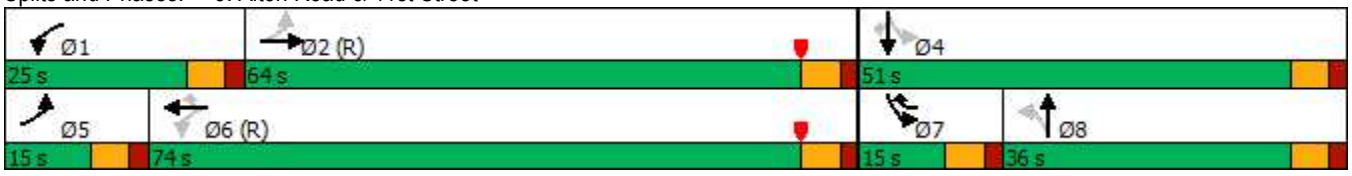
c Critical Lane Group

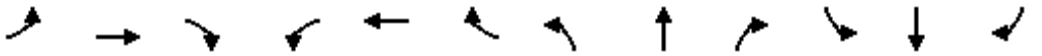
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	249	1292	36	971	56	123	129	44	106	117
Future Volume (vph)	249	1292	36	971	56	123	129	44	106	117
Lane Group Flow (vph)	257	1434	37	1001	58	0	300	45	109	121
Turn Type	pm+pt	NA	pm+pt	NA	pm+ov	Perm	NA	pm+pt	NA	Perm
Protected Phases	5	2	1	6	7		8	7	4	
Permitted Phases	2		6		6	8		4		4
Detector Phase	5	2	1	6	7	8	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	11.0	24.0	11.0	24.0	11.0	24.0	24.0	11.0	24.0	24.0
Total Split (s)	15.0	64.0	25.0	74.0	15.0	36.0	36.0	15.0	51.0	51.0
Total Split (%)	10.7%	45.7%	17.9%	52.9%	10.7%	25.7%	25.7%	10.7%	36.4%	36.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	C-Max	None	Max	Max	None	Max	Max
v/c Ratio	0.93	0.78	0.26	0.58	0.06		0.45	0.15	0.18	0.21
Control Delay	57.6	31.2	16.9	27.5	2.0		46.8	34.5	35.3	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	57.6	31.2	16.9	27.5	2.0		46.8	34.5	35.3	6.4
Queue Length 50th (ft)	107	554	13	336	0		121	29	72	0
Queue Length 95th (ft)	#241	666	29	405	15		173	59	120	46
Internal Link Dist (ft)		473		798			261		301	
Turn Bay Length (ft)	285		120		95			175		
Base Capacity (vph)	277	1838	304	1718	966		671	317	598	590
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	0.93	0.78	0.12	0.58	0.06		0.45	0.14	0.18	0.21

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 103 (74%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Alton Road & 41st Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	249	1292	99	36	971	56	123	129	39	44	106	117
Future Volume (veh/h)	249	1292	99	36	971	56	123	129	39	44	106	117
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	257	1332	0	37	1001	58	127	133	40	45	109	121
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	317	1858		197	1726	817	306	344	107	312	601	509
Arrive On Green	0.06	0.52	0.00	0.03	0.49	0.49	0.25	0.25	0.25	0.03	0.32	0.32
Sat Flow, veh/h	1781	3647	0	1781	3554	1585	1037	1381	429	1781	1870	1585
Grp Volume(v), veh/h	257	1332	0	37	1001	58	149	0	151	45	109	121
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1585	1222	0	1625	1781	1870	1585
Q Serve(g_s), s	9.0	40.1	0.0	1.4	28.2	2.6	14.3	0.0	10.8	2.6	5.9	7.9
Cycle Q Clear(g_c), s	9.0	40.1	0.0	1.4	28.2	2.6	14.5	0.0	10.8	2.6	5.9	7.9
Prop In Lane	1.00		0.00	1.00		1.00	0.86		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	317	1858		197	1726	817	352	0	405	312	601	509
V/C Ratio(X)	0.81	0.72		0.19	0.58	0.07	0.42	0.00	0.37	0.14	0.18	0.24
Avail Cap(c_a), veh/h	317	1858		390	1726	817	352	0	405	374	601	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.5	25.5	0.0	21.7	25.8	17.1	44.9	0.0	43.5	36.5	34.2	34.9
Incr Delay (d2), s/veh	13.6	2.4	0.0	0.2	1.4	0.2	3.7	0.0	2.6	0.1	0.7	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	17.3	0.0	0.6	12.3	1.0	4.8	0.0	4.7	1.1	2.8	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.1	27.9	0.0	21.9	27.2	17.2	48.6	0.0	46.2	36.6	34.9	36.0
LnGrp LOS	D	C		C	C	B	D	A	D	D	C	D
Approach Vol, veh/h		1589	A		1096			300			275	
Approach Delay, s/veh		29.7			26.5			47.3			35.7	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	79.2		51.0	15.0	74.0	10.1	40.9				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	19.0	58.0		45.0	9.0	68.0	9.0	30.0				
Max Q Clear Time (g_c+I1), s	3.4	42.1		9.9	11.0	30.2	4.6	16.5				
Green Ext Time (p_c), s	0.0	4.0		0.8	0.0	3.1	0.0	1.3				

Intersection Summary			
HCM 6th Ctrl Delay		30.8	
HCM 6th LOS		C	

Notes

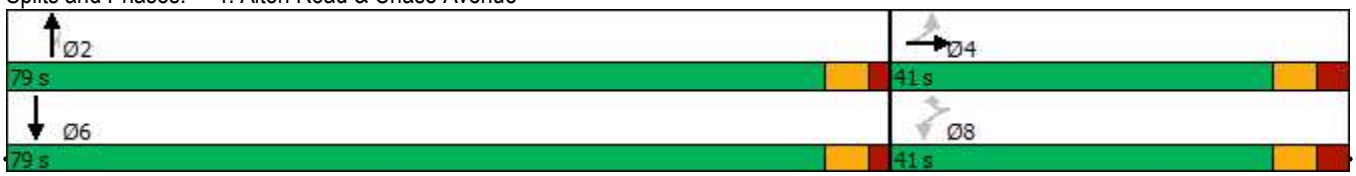
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

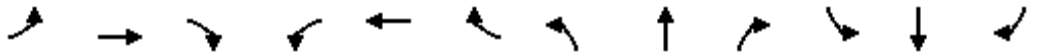
Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBT
Lane Configurations							
Traffic Volume (vph)	93	34	62	150	946	73	1719
Future Volume (vph)	93	34	62	150	946	73	1719
Lane Group Flow (vph)	100	48	67	161	1017	78	1853
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4			2		6
Permitted Phases	4		8	8		2	
Detector Phase	4	4	8	8	2	2	6
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	41.0	41.0	41.0	41.0	79.0	79.0	79.0
Total Split (%)	34.2%	34.2%	34.2%	34.2%	65.8%	65.8%	65.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	6.0	6.0	6.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	None	Max	Max	Max
v/c Ratio	0.53	0.24	0.47	0.59	0.38	0.06	1.55
Control Delay	51.4	34.8	51.2	21.8	4.6	2.2	269.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.4	34.8	51.2	21.8	4.6	2.2	269.8
Queue Length 50th (ft)	59	21	39	23	90	5	~846
Queue Length 95th (ft)	111	54	82	85	142	18	#1041
Internal Link Dist (ft)		300			1048		2492
Turn Bay Length (ft)	75		50			45	
Base Capacity (vph)	614	631	469	628	2692	1212	1196
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.08	0.14	0.26	0.38	0.06	1.55

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 97.9
Natural Cycle: 150
Control Type: Semi Act-Uncoord
~ 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.

Splits and Phases: 4: Alton Road & Chase Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	34	10	62	0	150	0	946	73	5	1719	0
Future Volume (vph)	93	34	10	62	0	150	0	946	73	5	1719	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0		7.0		6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00		1.00		0.95	1.00		0.95	
Frt	1.00	0.97		1.00		0.85		1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)	1770	1799		1770		1583		3539	1583		3539	
Flt Permitted	0.95	1.00		0.73		1.00		1.00	1.00		0.95	
Satd. Flow (perm)	1770	1799		1352		1583		3539	1583		3372	
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
Adj. Flow (vph)	100	37	11	67	0	161	0	1017	78	5	1848	0
RTOR Reduction (vph)	0	10	0	0	0	107	0	0	9	0	0	0
Lane Group Flow (vph)	100	38	0	67	0	54	0	1017	69	0	1853	0
Turn Type	Perm	NA		Perm		Perm		NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)	10.4	10.4		10.4		10.4		74.5	74.5		74.5	
Effective Green, g (s)	10.4	10.4		10.4		10.4		74.5	74.5		74.5	
Actuated g/C Ratio	0.11	0.11		0.11		0.11		0.76	0.76		0.76	
Clearance Time (s)	7.0	7.0		7.0		7.0		6.0	6.0		6.0	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		1.0	1.0		1.0	
Lane Grp Cap (vph)	188	191		143		168		2693	1204		2566	
v/s Ratio Prot		0.02						0.29				
v/s Ratio Perm	c0.06			0.05		0.03			0.04		c0.55	
v/c Ratio	0.53	0.20		0.47		0.32		0.38	0.06		0.72	
Uniform Delay, d1	41.4	40.0		41.2		40.5		3.9	2.9		6.2	
Progression Factor	1.00	1.00		1.00		1.00		1.00	1.00		1.00	
Incremental Delay, d2	2.2	0.4		1.8		0.8		0.4	0.1		1.8	
Delay (s)	43.7	40.3		42.9		41.3		4.3	3.0		8.0	
Level of Service	D	D		D		D		A	A		A	
Approach Delay (s)		42.6			41.8			4.2			8.0	
Approach LOS		D			D			A			A	

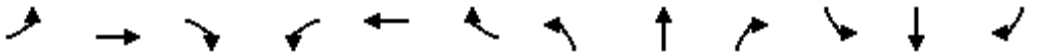
Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	97.9	Sum of lost time (s)	13.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	18	16	21	11	10	1462	85	1065
Future Volume (vph)	18	16	21	11	10	1462	85	1065
Lane Group Flow (vph)	0	41	0	66	11	1573	89	1124
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0
Minimum Split (s)	25.0	25.0	25.0	25.0	24.0	24.0	11.0	24.0
Total Split (s)	26.0	26.0	26.0	26.0	80.0	80.0	14.0	94.0
Total Split (%)	21.7%	21.7%	21.7%	21.7%	66.7%	66.7%	11.7%	78.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0		7.0	6.0	6.0	6.0	6.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Max	Max	None	Max
v/c Ratio		0.32		0.46	0.03	0.59	0.35	0.38
Control Delay		49.8		38.4	6.2	9.4	6.1	3.2
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		49.8		38.4	6.2	9.4	6.1	3.2
Queue Length 50th (ft)		24		23	2	268	9	86
Queue Length 95th (ft)		60		68	9	398	23	138
Internal Link Dist (ft)		184		729		2939		486
Turn Bay Length (ft)					55		115	
Base Capacity (vph)		284		290	355	2665	288	2978
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		0.14		0.23	0.03	0.59	0.31	0.38

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 109.6
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Alton Road & 47th Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	16	5	21	11	30	10	1462	32	85	1065	3
Future Volume (veh/h)	18	16	5	21	11	30	10	1462	32	85	1065	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	19	17	5	22	12	32	11	1539	34	89	1121	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	86	58	13	71	26	49	427	2553	56	308	2970	8
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.06	0.72	0.72	0.72	0.04	0.82	0.82
Sat Flow, veh/h	589	928	211	417	421	789	501	3555	78	1781	3636	10
Grp Volume(v), veh/h	41	0	0	66	0	0	11	768	805	89	548	576
Grp Sat Flow(s),veh/h/ln	1728	0	0	1627	0	0	501	1777	1856	1781	1777	1869
Q Serve(g_s), s	0.0	0.0	0.0	1.8	0.0	0.0	0.7	23.1	23.2	1.2	8.8	8.8
Cycle Q Clear(g_c), s	2.3	0.0	0.0	4.2	0.0	0.0	0.7	23.1	23.2	1.2	8.8	8.8
Prop In Lane	0.46		0.12	0.33		0.48	1.00		0.04	1.00		0.01
Lane Grp Cap(c), veh/h	157	0	0	146	0	0	427	1276	1333	308	1452	1527
V/C Ratio(X)	0.26	0.00	0.00	0.45	0.00	0.00	0.03	0.60	0.60	0.29	0.38	0.38
Avail Cap(c_a), veh/h	335	0	0	323	0	0	427	1276	1333	363	1452	1527
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.4	0.0	0.0	49.2	0.0	0.0	4.4	7.5	7.6	6.8	2.6	2.6
Incr Delay (d2), s/veh	0.7	0.0	0.0	1.6	0.0	0.0	0.1	2.1	2.0	0.2	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	1.8	0.0	0.0	0.1	8.3	8.6	0.5	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.1	0.0	0.0	50.9	0.0	0.0	4.5	9.6	9.6	7.0	3.4	3.3
LnGrp LOS	D	A	A	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h		41			66			1584			1213	
Approach Delay, s/veh		49.1			50.9			9.6			3.6	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.7	83.3		13.7		94.0		13.7				
Change Period (Y+Rc), s	6.0	6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s	8.0	74.0		19.0		88.0		19.0				
Max Q Clear Time (g_c+I1), s	3.2	25.2		4.3		10.8		6.2				
Green Ext Time (p_c), s	0.0	4.8		0.1		2.8		0.2				

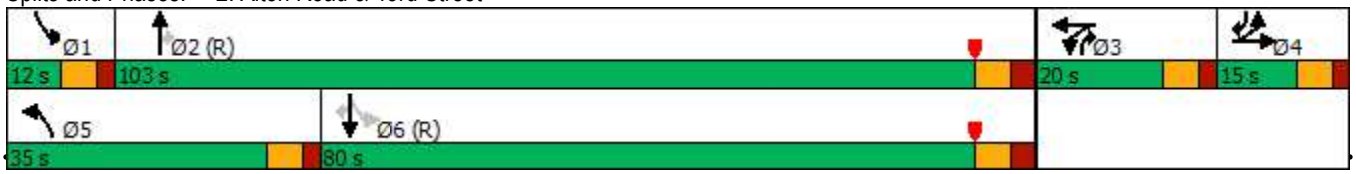
Intersection Summary			
HCM 6th Ctrl Delay		8.6	
HCM 6th LOS		A	

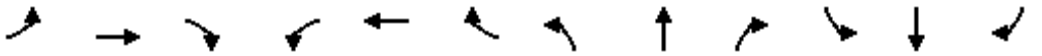
Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	66	141	49	102	1246	55	71	955	40
Future Volume (vph)	66	141	49	102	1246	55	71	955	40
Lane Group Flow (vph)	202	153	69	111	1354	60	77	1038	43
Turn Type	NA	Free	NA	Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4		3	5	2	3	1	6	4
Permitted Phases		Free				2	6		6
Detector Phase	4		3	5	2	3	1	6	4
Switch Phase									
Minimum Initial (s)	7.0		7.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	24.0		24.0	11.0	25.0	24.0	11.0	25.0	24.0
Total Split (s)	15.0		20.0	35.0	103.0	20.0	12.0	80.0	15.0
Total Split (%)	10.0%		13.3%	23.3%	68.7%	13.3%	8.0%	53.3%	10.0%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	7.0	6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None		None	None	C-Max	None	None	C-Max	None
v/c Ratio	0.97dl	0.10	0.51	0.40	0.59	0.05	0.32	0.49	0.04
Control Delay	87.5	0.1	79.2	69.3	16.8	0.8	10.3	18.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.5	0.1	79.2	69.3	16.8	0.8	10.3	18.1	0.1
Queue Length 50th (ft)	103	0	66	54	384	0	20	291	0
Queue Length 95th (ft)	#194	0	118	85	449	9	35	363	0
Internal Link Dist (ft)	651		364		2492			2939	
Turn Bay Length (ft)				315		50	130		75
Base Capacity (vph)	260	1583	171	663	2282	1257	244	2130	1118
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	0.78	0.10	0.40	0.17	0.59	0.05	0.32	0.49	0.04

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow
Natural Cycle: 105
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: Alton Road & 43rd Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	66	141	15	49	0	102	1246	55	71	955	40
Future Volume (vph)	120	66	141	15	49	0	102	1246	55	71	955	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0		6.0		6.0	7.0	6.0	6.0	7.0	6.0
Lane Util. Factor		0.95	1.00		1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3429	1583		1841		3433	3539	1583	1770	3539	1583
Flt Permitted		0.97	1.00		0.99		0.95	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)		3429	1583		1841		3433	3539	1583	286	3539	1583
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
Adj. Flow (vph)	130	72	153	16	53	0	111	1354	60	77	1038	43
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	17	0	0	14
Lane Group Flow (vph)	0	202	153	0	69	0	111	1354	43	77	1038	29
Turn Type	Split	NA	Free	Split	NA		Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4	4		3	3		5	2	3	1	6	4
Permitted Phases			Free						2	6		6
Actuated Green, G (s)		11.4	150.0		11.1		12.2	96.8	107.9	96.0	90.3	101.7
Effective Green, g (s)		11.4	150.0		11.1		12.2	96.8	107.9	96.0	90.3	101.7
Actuated g/C Ratio		0.08	1.00		0.07		0.08	0.65	0.72	0.64	0.60	0.68
Clearance Time (s)		6.0			6.0		6.0	7.0	6.0	6.0	7.0	6.0
Vehicle Extension (s)		2.5			3.5		5.0	1.0	3.5	2.0	1.0	2.5
Lane Grp Cap (vph)		260	1583		136		279	2283	1138	239	2130	1073
v/s Ratio Prot		c0.06			c0.04		c0.03	c0.38	0.00	0.01	0.29	0.00
v/s Ratio Perm			0.10						0.02	0.19		0.02
v/c Ratio		0.97dl	0.10		0.51		0.40	0.59	0.04	0.32	0.49	0.03
Uniform Delay, d1		68.1	0.0		66.8		65.4	15.3	6.1	12.1	16.8	7.9
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		13.1	0.1		3.5		1.9	1.1	0.0	0.3	0.8	0.0
Delay (s)		81.1	0.1		70.3		67.4	16.4	6.1	12.4	17.6	7.9
Level of Service		F	A		E		E	B	A	B	B	A
Approach Delay (s)		46.2			70.3			19.7			16.9	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

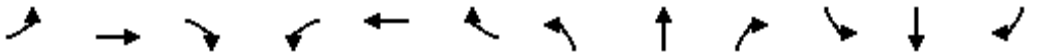
dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	141	1305	14	1539	38	238	99	64	73	334
Future Volume (vph)	141	1305	14	1539	38	238	99	64	73	334
Lane Group Flow (vph)	145	1381	14	1587	39	0	407	66	75	344
Turn Type	pm+pt	NA	pm+pt	NA	pm+ov	Perm	NA	pm+pt	NA	Perm
Protected Phases	5	2	1	6	7		8	7	4	
Permitted Phases	2		6		6	8		4		4
Detector Phase	5	2	1	6	7	8	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	11.0	24.0	11.0	24.0	11.0	24.0	24.0	11.0	24.0	24.0
Total Split (s)	12.0	99.0	12.0	99.0	13.0	36.0	36.0	13.0	49.0	49.0
Total Split (%)	7.5%	61.9%	7.5%	61.9%	8.1%	22.5%	22.5%	8.1%	30.6%	30.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	C-Max	None	Max	Max	None	Max	Max
v/c Ratio	1.03	0.62	0.07	0.77	0.04		0.95dl	0.35	0.15	0.70
Control Delay	106.3	20.5	10.5	28.7	0.8		73.7	50.2	45.7	46.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	106.3	20.5	10.5	28.7	0.8		73.7	50.2	45.7	46.8
Queue Length 50th (ft)	~70	405	5	641	0		212	53	60	244
Queue Length 95th (ft)	#169	580	14	736	6		#289	96	107	367
Internal Link Dist (ft)		473		798			261		301	
Turn Bay Length (ft)	285		120		95			175		
Base Capacity (vph)	141	2213	202	2057	1069		504	188	500	491
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	1.03	0.62	0.07	0.77	0.04		0.81	0.35	0.15	0.70

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 118 (74%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
~ 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.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 3: Alton Road & 41st Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	1305	35	14	1539	38	238	99	58	64	73	334
Future Volume (veh/h)	141	1305	35	14	1539	38	238	99	58	64	73	334
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	145	1345	0	14	1587	39	245	102	60	66	75	344
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	187	2147		218	2066	984	231	193	113	238	503	426
Arrive On Green	0.04	0.60	0.00	0.01	0.58	0.58	0.19	0.19	0.19	0.04	0.27	0.27
Sat Flow, veh/h	1781	3647	0	1781	3554	1585	968	1005	591	1781	1870	1585
Grp Volume(v), veh/h	145	1345	0	14	1587	39	245	0	162	66	75	344
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1585	968	0	1596	1781	1870	1585
Q Serve(g_s), s	5.4	38.6	0.0	0.5	54.1	1.5	30.7	0.0	14.6	4.7	4.9	32.4
Cycle Q Clear(g_c), s	5.4	38.6	0.0	0.5	54.1	1.5	30.7	0.0	14.6	4.7	4.9	32.4
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	187	2147		218	2066	984	231	0	306	238	503	426
V/C Ratio(X)	0.77	0.63		0.06	0.77	0.04	1.06	0.00	0.53	0.28	0.15	0.81
Avail Cap(c_a), veh/h	187	2147		259	2066	984	231	0	306	246	503	426
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.6	20.2	0.0	17.1	25.3	11.8	67.6	0.0	58.2	48.4	44.6	54.6
Incr Delay (d2), s/veh	16.6	1.4	0.0	0.0	2.8	0.1	76.7	0.0	6.4	0.2	0.6	15.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	16.3	0.0	0.2	23.3	0.6	14.5	0.0	6.5	2.1	2.4	14.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.2	21.6	0.0	17.2	28.2	11.9	144.3	0.0	64.6	48.7	45.2	69.7
LnGrp LOS	D	C		B	C	B	F	A	E	D	D	E
Approach Vol, veh/h		1490	A		1640			407			485	
Approach Delay, s/veh		23.9			27.7			112.6			63.1	
Approach LOS		C			C			F			E	

Timer - Assigned Phs	1	2		4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	102.7		49.0	12.0	99.0	12.3	36.7
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	6.0	93.0		43.0	6.0	93.0	7.0	30.0
Max Q Clear Time (g_c+I1), s	2.5	40.6		34.4	7.4	56.1	6.7	32.7
Green Ext Time (p_c), s	0.0	4.7		0.9	0.0	6.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	39.2
HCM 6th LOS	D

Notes

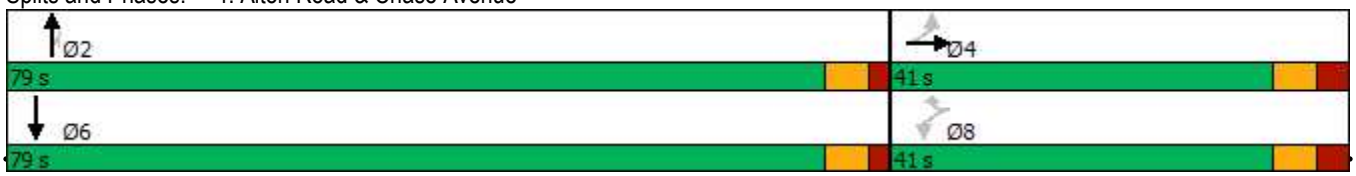
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

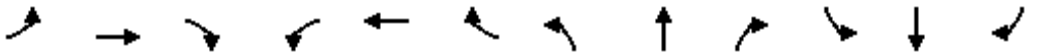
Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBT
Lane Configurations							
Traffic Volume (vph)	200	11	32	231	1786	27	1727
Future Volume (vph)	200	11	32	231	1786	27	1727
Lane Group Flow (vph)	206	13	33	238	1841	28	1783
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4			2		6
Permitted Phases	4		8	8		2	
Detector Phase	4	4	8	8	2	2	6
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	41.0	41.0	41.0	41.0	79.0	79.0	79.0
Total Split (%)	34.2%	34.2%	34.2%	34.2%	65.8%	65.8%	65.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	6.0	6.0	6.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	None	Max	Max	Max
v/c Ratio	0.65	0.04	0.13	0.78	0.75	0.03	1.63
Control Delay	49.6	30.7	36.3	53.6	13.6	1.9	309.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	30.7	36.3	53.6	13.6	1.9	309.1
Queue Length 50th (ft)	130	6	19	137	362	0	~911
Queue Length 95th (ft)	205	22	45	223	594	8	#1167
Internal Link Dist (ft)		300			1048		2492
Turn Bay Length (ft)	75		50			45	
Base Capacity (vph)	574	591	452	531	2464	1113	1092
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.02	0.07	0.45	0.75	0.03	1.63

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 105.1
Natural Cycle: 150
Control Type: Semi Act-Uncoord
~ 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.

Splits and Phases: 4: Alton Road & Chase Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	11	2	32	0	231	0	1786	27	3	1727	0
Future Volume (vph)	200	11	2	32	0	231	0	1786	27	3	1727	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0		7.0		6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00		1.00		0.95	1.00		0.95	
Frt	1.00	0.98		1.00		0.85		1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)	1770	1820		1770		1583		3539	1583		3539	
Flt Permitted	0.95	1.00		0.75		1.00		1.00	1.00		0.95	
Satd. Flow (perm)	1770	1820		1395		1583		3539	1583		3369	
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
Adj. Flow (vph)	206	11	2	33	0	238	0	1841	28	3	1780	0
RTOR Reduction (vph)	0	2	0	0	0	22	0	0	8	0	0	0
Lane Group Flow (vph)	206	11	0	33	0	216	0	1841	20	0	1783	0
Turn Type	Perm	NA		Perm		Perm		NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)	18.9	18.9		18.9		18.9		73.2	73.2		73.2	
Effective Green, g (s)	18.9	18.9		18.9		18.9		73.2	73.2		73.2	
Actuated g/C Ratio	0.18	0.18		0.18		0.18		0.70	0.70		0.70	
Clearance Time (s)	7.0	7.0		7.0		7.0		6.0	6.0		6.0	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		1.0	1.0		1.0	
Lane Grp Cap (vph)	318	327		250		284		2464	1102		2346	
v/s Ratio Prot		0.01						0.52				
v/s Ratio Perm	0.12			0.02		c0.14			0.01		c0.53	
v/c Ratio	0.65	0.03		0.13		0.76		0.75	0.02		0.76	
Uniform Delay, d1	40.0	35.6		36.2		40.9		10.1	4.9		10.3	
Progression Factor	1.00	1.00		1.00		1.00		1.00	1.00		1.00	
Incremental Delay, d2	4.0	0.0		0.2		10.9		2.1	0.0		2.4	
Delay (s)	44.0	35.6		36.4		51.8		12.2	4.9		12.7	
Level of Service	D	D		D		D		B	A		B	
Approach Delay (s)		43.5			49.9			12.1			12.7	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	105.1	Sum of lost time (s)	13.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

FUTURE BUILD CONDITIONS

Table 5.1 - 2025 Build Intersection Capacity Analysis Summary

Location	Time	Level of Service[1]											
		Alton Road & 47th Street		Alton Road & 43rd Street		Alton Road & 43rd Street[3]		Alton Road & 41st Street		Alton Road & 41st Street[3]		Alton Road & Chase Avenue	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
EBL	AM	D	48.8	E	70.1	E	69.2	D	39.4	-	-	D	43.7
	PM	D	49.1	F	100.1	E	70	D	46.3	E	57.0	D	44.0
EBT	AM	A	0.0	E	70.1	E	69.2	C	27.9	-	-	D	40.3
	PM	A	0.0	F	100.1	E	70	C	21.6	C	30.0	D	35.6
EBR	AM	A	0.0	A	0.1	A	0.1	A	0.0	-	-	D	40.3
	PM	A	0.0	A	0.1	A	0.1	A	0.0	A	0.0	D	35.6
EB Approach	AM	D	48.8	C	25.1	C	24.7	C	29.8	-	-	D	42.6
	PM	D	49.1	E	57.2	D	40.0	C	24.0	C	32.6	D	43.5
WBL	AM	D	50.2	F	131.0	E	77.6	C	21.9	-	-	D	42.9
	PM	D	50.9	E	70.6	E	69.6	B	17.2	C	24.2	D	36.4
WBT	AM	A	0.0	F	131.0	E	77.6	C	27.2	-	-	[N/A]	
	PM	A	0.0	E	70.6	E	69.6	C	28.2	D	44.0		
WBR	AM	A	0.0	F	131.0	E	77.6	B	17.3	-	-	D	41.6
	PM	A	0.0	E	70.6	E	69.6	B	11.7	B	18.3	D	51.8
WB Approach	AM	D	50.2	F	131.0	E	77.6	C	26.4	-	-	D	42.0
	PM	D	50.9	E	70.6	E	69.6	C	27.6	D	43.1	D	49.9
NBL	AM	A	8.0	F	109.2	E	69.4	D	48.7	-	-	[N/A]	
	PM	A	4.5	E	67.0	E	68.5	F	149.3	E	77.0		
NBT	AM	A	7.8	B	15.1	B	18.7	A	0.0	-	-	A	4.3
	PM	A	9.9	B	16.7	C	20.1	A	0.0	A	0.0	B	12.2
NBR	AM	A	7.7	A	5.2	A	5.7	D	46.3	-	-	A	3.0
	PM	A	9.8	A	6.1	A	7.6	E	65.3	D	50.1	A	4.9
NB Approach	AM	A	7.7	D	49.5	D	37.2	D	47.5	-	-	A	4.3
	PM	A	9.8	C	21.2	C	24.3	F	115.9	E	66.3	B	12.1
SBL	AM	A	4.6	B	18.0	C	22.7	D	36.7	-	-	A	8.1
	PM	A	7.3	B	13.0	B	14.9	D	48.9	D	40.3	B	13.0
SBT	AM	A	5.1	D	42.5	E	76.2	C	34.9	-	-	A	8.1
	PM	A	3.4	B	18.9	C	21	D	45.2	D	37.0	B	13.0
SBR	AM	A	5.0	B	17.7	C	22.7	D	36.0	-	-	[N/A]	
	PM	A	3.4	A	8.7	A	8.5	E	69.7	D	50.7		
SB Approach	AM	A	5.1	D	38.3	E	67.2	D	35.7	-	-	A	8.1
	PM	A	3.7	B	18.0	B	19.9	E	62.9	D	47.1	B	13.0
Overall	AM	A	7.3	D	46.4	D	51.5	C	30.8	-	-	B	10.7
	PM	A	8.7	C	25.8	C	25.8	D	39.6	D	42.1	B	16.6

[1] Delay is average delay per vehicle in seconds
[2] Approach operates under Free-flow conditions
[3] Optimized signal timing without changing cycle length

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Table 5.2 -2025 Build Intersection Queue Lengths Summary

Location	Time	95th Percentile Queue Lenghts (ft)															
		EBL		EBR		WBL		WBR		NBL		NBR		SBL		SBR	
		Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile	Storage (ft)	95th %tile
Alton Road & 47th Street	AM									55	19			115	15		
	PM										9				23		
Alton Road & 43rd Street	AM									315	#525	50	1	130	40	75	55
	AM[1]										#520		1		50		55
	PM										110		9		35		0
	PM[1]										114		13		47		7
Alton Road & 41st Street	AM	285	#241			120	29	95	18					175	62		
	PM		#169				14		8						103		
	PM[1]		#210				17		0						93		
Alton Road & Chase Avenue	AM	75	111			50	82					45	18				
	PM		205				45						8				

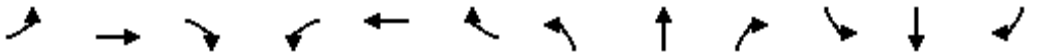
 # 95th percentile volume exceeds capacity, queue may be longer.
m Volume for 95th percentile queue is metered by upstream signal.
[1] Optimized signal timing without changing cycle length

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	12	11	20	6	24	1216	53	1662
Future Volume (vph)	12	11	20	6	24	1216	53	1662
Lane Group Flow (vph)	0	31	0	52	25	1321	56	1753
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0
Minimum Split (s)	25.0	25.0	25.0	25.0	24.0	24.0	11.0	24.0
Total Split (s)	26.0	26.0	26.0	26.0	80.0	80.0	14.0	94.0
Total Split (%)	21.7%	21.7%	21.7%	21.7%	66.7%	66.7%	11.7%	78.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0		7.0	6.0	6.0	6.0	6.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Max	Max	None	Max
v/c Ratio		0.27		0.40	0.14	0.49	0.17	0.58
Control Delay		46.8		38.8	8.0	7.4	3.4	4.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		46.8		38.8	8.0	7.4	3.4	4.5
Queue Length 50th (ft)		17		18	5	192	6	178
Queue Length 95th (ft)		48		57	19	280	15	274
Internal Link Dist (ft)		184		729		2939		486
Turn Bay Length (ft)					55		115	
Base Capacity (vph)		265		275	181	2698	360	2999
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		0.12		0.19	0.14	0.49	0.16	0.58

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 111.1
Natural Cycle: 70
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Alton Road & 47th Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	11	6	20	6	24	24	1216	39	53	1662	4
Future Volume (veh/h)	12	11	6	20	6	24	24	1216	39	53	1662	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	13	12	6	21	6	25	25	1280	41	56	1749	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	76	53	20	76	20	46	246	2550	82	370	2980	7
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.06	0.73	0.73	0.73	0.04	0.82	0.82
Sat Flow, veh/h	478	894	329	492	333	763	274	3514	112	1781	3637	8
Grp Volume(v), veh/h	31	0	0	52	0	0	25	647	674	56	854	899
Grp Sat Flow(s),veh/h/ln	1702	0	0	1588	0	0	274	1777	1850	1781	1777	1869
Q Serve(g_s), s	0.0	0.0	0.0	1.5	0.0	0.0	3.8	16.9	16.9	0.8	18.0	18.0
Cycle Q Clear(g_c), s	1.8	0.0	0.0	3.3	0.0	0.0	11.7	16.9	16.9	0.8	18.0	18.0
Prop In Lane	0.42		0.19	0.40		0.48	1.00		0.06	1.00		0.00
Lane Grp Cap(c), veh/h	149	0	0	142	0	0	246	1289	1342	370	1456	1531
V/C Ratio(X)	0.21	0.00	0.00	0.37	0.00	0.00	0.10	0.50	0.50	0.15	0.59	0.59
Avail Cap(c_a), veh/h	334	0	0	321	0	0	246	1289	1342	436	1456	1531
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.3	0.0	0.0	49.0	0.0	0.0	7.2	6.4	6.4	4.6	3.4	3.4
Incr Delay (d2), s/veh	0.5	0.0	0.0	1.2	0.0	0.0	0.8	1.4	1.3	0.1	1.7	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	1.4	0.0	0.0	0.3	5.9	6.1	0.2	4.9	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.8	0.0	0.0	50.2	0.0	0.0	8.0	7.8	7.7	4.6	5.1	5.0
LnGrp LOS	D	A	A	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h		31			52			1346			1809	
Approach Delay, s/veh		48.8			50.2			7.7			5.1	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.1	83.9		13.4		94.0		13.4				
Change Period (Y+Rc), s	6.0	6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s	8.0	74.0		19.0		88.0		19.0				
Max Q Clear Time (g_c+I1), s	2.8	18.9		3.8		20.0		5.3				
Green Ext Time (p_c), s	0.0	4.0		0.1		5.7		0.1				

Intersection Summary												
HCM 6th Ctrl Delay			7.3									
HCM 6th LOS			A									

Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	32	156	150	655	1095	29	82	1414	202
Future Volume (vph)	32	156	150	655	1095	29	82	1414	202
Lane Group Flow (vph)	94	170	170	712	1190	32	89	1537	220
Turn Type	NA	Free	NA	Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4		3	5	2	3	1	6	4
Permitted Phases		Free				2	6		6
Detector Phase	4		3	5	2	3	1	6	4
Switch Phase									
Minimum Initial (s)	7.0		7.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	24.0		24.0	11.0	25.0	24.0	11.0	25.0	24.0
Total Split (s)	15.0		20.0	35.0	103.0	20.0	12.0	80.0	15.0
Total Split (%)	10.0%		13.3%	23.3%	68.7%	13.3%	8.0%	53.3%	10.0%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	7.0	6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None		None	None	C-Max	None	None	C-Max	None
v/c Ratio	0.49	0.11	0.98	1.05	0.52	0.03	0.31	0.89	0.24
Control Delay	77.6	0.1	130.4	105.4	15.3	0.1	12.5	42.9	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.6	0.1	130.4	105.4	15.3	0.1	12.5	42.9	5.1
Queue Length 50th (ft)	47	0	169	~397	314	0	23	705	29
Queue Length 95th (ft)	80	0	#327	#525	369	1	40	818	55
Internal Link Dist (ft)	651		364		2492			2939	
Turn Bay Length (ft)				315		50	130		75
Base Capacity (vph)	205	1583	173	677	2283	1257	288	1722	924
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	0.46	0.11	0.98	1.05	0.52	0.03	0.31	0.89	0.24

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow
Natural Cycle: 145
Control Type: Actuated-Coordinated
~ 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.

Splits and Phases: 2: Alton Road & 43rd Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	32	156	6	150	0	655	1095	29	82	1414	202
Future Volume (vph)	54	32	156	6	150	0	655	1095	29	82	1414	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0		6.0		6.0	7.0	6.0	6.0	7.0	6.0
Lane Util. Factor		0.95	1.00		1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00		1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3432	1583		1859		3433	3539	1583	1770	3539	1583
Flt Permitted		0.97	1.00		1.00		0.95	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)		3432	1583		1859		3433	3539	1583	442	3539	1583
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
Adj. Flow (vph)	59	35	170	7	163	0	712	1190	32	89	1537	220
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	8	0	0	50
Lane Group Flow (vph)	0	94	170	0	170	0	712	1190	24	89	1537	170
Turn Type	Split	NA	Free	Split	NA		Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4	4		3	3		5	2	3	1	6	4
Permitted Phases			Free						2	6		6
Actuated Green, G (s)		8.4	150.0		14.0		29.6	96.8	110.8	78.8	73.0	81.4
Effective Green, g (s)		8.4	150.0		14.0		29.6	96.8	110.8	78.8	73.0	81.4
Actuated g/C Ratio		0.06	1.00		0.09		0.20	0.65	0.74	0.53	0.49	0.54
Clearance Time (s)		6.0			6.0		6.0	7.0	6.0	6.0	7.0	6.0
Vehicle Extension (s)		2.5			3.5		5.0	1.0	3.5	2.0	1.0	2.5
Lane Grp Cap (vph)		192	1583		173		677	2283	1169	283	1722	859
v/s Ratio Prot		c0.03			c0.09		c0.21	0.34	0.00	0.01	c0.43	0.01
v/s Ratio Perm			0.11						0.01	0.15		0.10
v/c Ratio		0.49	0.11		0.98		1.05	0.52	0.02	0.31	0.89	0.20
Uniform Delay, d1		68.7	0.0		67.9		60.2	14.2	5.2	17.8	34.9	17.6
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.4	0.1		63.1		49.0	0.9	0.0	0.2	7.5	0.1
Delay (s)		70.1	0.1		131.0		109.2	15.1	5.2	18.0	42.5	17.7
Level of Service		E	A		F		F	B	A	B	D	B
Approach Delay (s)		25.1			131.0			49.5			38.3	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		

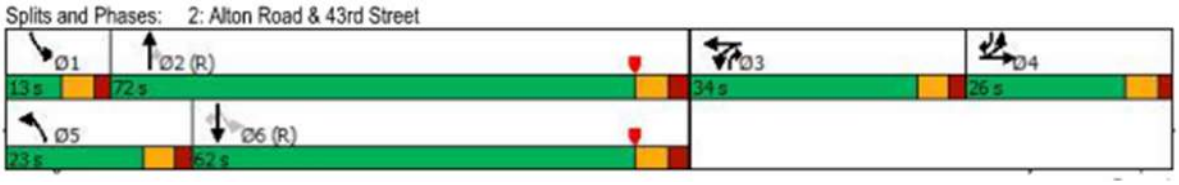
c Critical Lane Group

MSMC Cancer Center
Signal Timing Optimization Modifications
17th June 2022
330089601

Alton Road & 43rd Street

Morning Peak Hour

Existing Timing



Optimized Timing

Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	32	156	150	655	1095	29	82	1414	202
Future Volume (vph)	32	156	150	655	1095	29	82	1414	202
Lane Group Flow (vph)	94	170	170	712	1190	32	89	1537	220
Turn Type	NA	Free	NA	Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4		3	5	2	3	1	6	4
Permitted Phases		Free				2	6		6
Detector Phase	4		3	5	2	3	1	6	4
Switch Phase									
Minimum Initial (s)	7.0		7.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	24.0		24.0	11.0	25.0	24.0	11.0	25.0	24.0
Total Split (s)	24.0		27.0	29.0	87.0	27.0	12.0	70.0	24.0
Total Split (%)	16.0%		18.0%	19.3%	58.0%	18.0%	8.0%	46.7%	16.0%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	7.0	6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None		None	None	C-Max	None	None	C-Max	None
v/c Ratio	0.45	0.11	0.76	0.90	0.56	0.03	0.33	1.03	0.27
Control Delay	74.6	0.1	84.3	70.8	19.8	0.1	15.5	75.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.6	0.1	84.3	70.8	19.8	0.1	15.5	75.0	6.3
Queue Length 50th (ft)	47	0	162	355	355	0	26	~847	33
Queue Length 95th (ft)	78	0	245	#520	467	1	50	#987	55
Internal Link Dist (ft)	651		364		2492			2939	
Turn Bay Length (ft)				315		50	130		75
Base Capacity (vph)	411	1583	260	793	2139	1266	272	1486	914
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	0.23	0.11	0.65	0.90	0.56	0.03	0.33	1.03	0.24

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow
Natural Cycle: 145
Control Type: Actuated-Coordinated
~ 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.

Splits and Phases: 2: Alton Road & 43rd Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	32	156	6	150	0	655	1095	29	82	1414	202
Future Volume (vph)	54	32	156	6	150	0	655	1095	29	82	1414	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0		6.0		6.0	7.0	6.0	6.0	7.0	6.0
Lane Util. Factor		0.95	1.00		1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00		1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3432	1583		1859		3433	3539	1583	1770	3539	1583
Flt Permitted		0.97	1.00		1.00		0.95	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)		3432	1583		1859		3433	3539	1583	442	3539	1583
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
Adj. Flow (vph)	59	35	170	7	163	0	712	1190	32	89	1537	220
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	9	0	0	57
Lane Group Flow (vph)	0	94	170	0	170	0	712	1190	23	89	1537	163
Turn Type	Split	NA	Free	Split	NA		Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4	4		3	3		5	2	3	1	6	4
Permitted Phases			Free						2	6		6
Actuated Green, G (s)		9.1	150.0		18.2		34.7	90.7	108.9	70.0	63.0	72.1
Effective Green, g (s)		9.1	150.0		18.2		34.7	90.7	108.9	70.0	63.0	72.1
Actuated g/C Ratio		0.06	1.00		0.12		0.23	0.60	0.73	0.47	0.42	0.48
Clearance Time (s)		6.0			6.0		6.0	7.0	6.0	6.0	7.0	6.0
Vehicle Extension (s)		2.5			3.5		5.0	1.0	3.5	2.0	1.0	2.5
Lane Grp Cap (vph)		208	1583		225		794	2139	1149	268	1486	760
v/s Ratio Prot		c0.03			c0.09		c0.21	0.34	0.00	0.02	c0.43	0.01
v/s Ratio Perm			0.11						0.01	0.14		0.09
v/c Ratio		0.45	0.11		0.76		0.90	0.56	0.02	0.33	1.03	0.21
Uniform Delay, d1		68.0	0.0		63.7		55.9	17.7	5.7	22.5	43.5	22.6
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.1	0.1		13.8		13.5	1.0	0.0	0.3	32.7	0.1
Delay (s)		69.2	0.1		77.6		69.4	18.7	5.7	22.7	76.2	22.7
Level of Service		E	A		E		E	B	A	C	E	C
Approach Delay (s)		24.7			77.6			37.2			67.2	
Approach LOS		C			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	51.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: Alton Road & 47th Street

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	53	69	29	158	152	39	117	122
Average Queue (ft)	29	34	6	67	71	23	66	56
95th Queue (ft)	57	73	25	155	152	36	129	120
Link Distance (ft)	220	747		2955	2955		517	517
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			55			115		
Storage Blk Time (%)				6			1	
Queuing Penalty (veh)				2			0	

Intersection: 2: Alton Road & 43rd Street

Movement	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	LT	L	L	T	T	L	T	T	R
Maximum Queue (ft)	112	203	326	339	448	369	154	922	898	100
Average Queue (ft)	78	136	241	255	264	245	60	657	675	98
95th Queue (ft)	117	230	339	339	432	362	147	933	939	103
Link Distance (ft)	660	385			2449	2449		2955	2955	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			315	315			130			75
Storage Blk Time (%)			1	6	0	26		43	47	0
Queuing Penalty (veh)			6	33	1	8		35	96	1

Intersection: 3: Alton Road & 41st Street

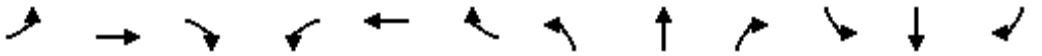
Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	TR	L	T	R
Maximum Queue (ft)	309	397	341	52	404	404	120	166	138	52	73	175
Average Queue (ft)	162	269	264	14	339	281	53	144	80	26	54	66
95th Queue (ft)	288	384	340	47	437	412	142	178	180	54	74	158
Link Distance (ft)		497	497		838	838		284	284		327	327
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	285			120			95			175		
Storage Blk Time (%)		4			43	38	0					
Queuing Penalty (veh)		11			16	24	0					

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	249	1292	36	971	62	123	129	47	106	117
Future Volume (vph)	249	1292	36	971	62	123	129	47	106	117
Lane Group Flow (vph)	257	1434	37	1001	64	0	300	48	109	121
Turn Type	pm+pt	NA	pm+pt	NA	pm+ov	Perm	NA	pm+pt	NA	Perm
Protected Phases	5	2	1	6	7		8	7	4	
Permitted Phases	2		6		6	8		4		4
Detector Phase	5	2	1	6	7	8	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	11.0	24.0	11.0	24.0	11.0	24.0	24.0	11.0	24.0	24.0
Total Split (s)	15.0	64.0	25.0	74.0	15.0	36.0	36.0	15.0	51.0	51.0
Total Split (%)	10.7%	45.7%	17.9%	52.9%	10.7%	25.7%	25.7%	10.7%	36.4%	36.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	C-Max	None	Max	Max	None	Max	Max
v/c Ratio	0.93	0.78	0.26	0.58	0.07		0.45	0.16	0.18	0.21
Control Delay	57.6	31.2	16.9	27.5	2.4		46.9	34.6	35.3	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	57.6	31.2	16.9	27.5	2.4		46.9	34.6	35.3	6.4
Queue Length 50th (ft)	107	554	13	336	0		121	31	72	0
Queue Length 95th (ft)	#241	666	29	405	18		173	62	120	46
Internal Link Dist (ft)		473		798			261		301	
Turn Bay Length (ft)	285		120		95			175		
Base Capacity (vph)	277	1838	304	1718	966		669	316	598	590
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	0.93	0.78	0.12	0.58	0.07		0.45	0.15	0.18	0.21

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 103 (74%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Alton Road & 41st Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	249	1292	99	36	971	62	123	129	39	47	106	117
Future Volume (veh/h)	249	1292	99	36	971	62	123	129	39	47	106	117
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	257	1332	0	37	1001	64	127	133	40	48	109	121
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	316	1858		197	1726	818	305	343	107	313	601	509
Arrive On Green	0.06	0.52	0.00	0.03	0.49	0.49	0.25	0.25	0.25	0.03	0.32	0.32
Sat Flow, veh/h	1781	3647	0	1781	3554	1585	1037	1381	429	1781	1870	1585
Grp Volume(v), veh/h	257	1332	0	37	1001	64	149	0	151	48	109	121
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1585	1222	0	1625	1781	1870	1585
Q Serve(g_s), s	9.0	40.1	0.0	1.4	28.2	2.9	14.3	0.0	10.8	2.7	5.9	7.9
Cycle Q Clear(g_c), s	9.0	40.1	0.0	1.4	28.2	2.9	14.5	0.0	10.8	2.7	5.9	7.9
Prop In Lane	1.00		0.00	1.00		1.00	0.86		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	316	1858		197	1726	818	351	0	404	313	601	509
V/C Ratio(X)	0.81	0.72		0.19	0.58	0.08	0.42	0.00	0.38	0.15	0.18	0.24
Avail Cap(c_a), veh/h	316	1858		390	1726	818	351	0	404	373	601	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	25.5	0.0	21.7	25.8	17.1	45.0	0.0	43.6	36.6	34.2	34.9
Incr Delay (d2), s/veh	13.8	2.4	0.0	0.2	1.4	0.2	3.7	0.0	2.7	0.1	0.7	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	17.3	0.0	0.6	12.3	1.1	4.8	0.0	4.7	1.2	2.8	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.4	27.9	0.0	21.9	27.2	17.3	48.7	0.0	46.3	36.7	34.9	36.0
LnGrp LOS	D	C		C	C	B	D	A	D	D	C	D
Approach Vol, veh/h		1589	A		1102			300			278	
Approach Delay, s/veh		29.8			26.4			47.5			35.7	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	79.2		51.0	15.0	74.0	10.2	40.8				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	19.0	58.0		45.0	9.0	68.0	9.0	30.0				
Max Q Clear Time (g_c+I1), s	3.4	42.1		9.9	11.0	30.2	4.7	16.5				
Green Ext Time (p_c), s	0.0	4.0		0.8	0.0	3.1	0.0	1.3				

Intersection Summary			
HCM 6th Ctrl Delay		30.8	
HCM 6th LOS		C	

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBT
Lane Configurations							
Traffic Volume (vph)	93	34	62	150	971	73	1731
Future Volume (vph)	93	34	62	150	971	73	1731
Lane Group Flow (vph)	100	48	67	161	1044	78	1866
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4			2		6
Permitted Phases	4		8	8		2	
Detector Phase	4	4	8	8	2	2	6
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	41.0	41.0	41.0	41.0	79.0	79.0	79.0
Total Split (%)	34.2%	34.2%	34.2%	34.2%	65.8%	65.8%	65.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	6.0	6.0	6.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	None	Max	Max	Max
v/c Ratio	0.53	0.24	0.47	0.60	0.39	0.06	1.56
Control Delay	51.4	34.8	51.2	24.0	4.7	2.2	274.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.4	34.8	51.2	24.0	4.7	2.2	274.7
Queue Length 50th (ft)	59	21	39	28	93	5	~855
Queue Length 95th (ft)	111	54	82	90	146	18	#1051
Internal Link Dist (ft)		300			1048		2492
Turn Bay Length (ft)	75		50			45	
Base Capacity (vph)	614	631	469	623	2692	1212	1196
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.08	0.14	0.26	0.39	0.06	1.56

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 97.9
Natural Cycle: 150
Control Type: Semi Act-Uncoord
~ 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.

Splits and Phases: 4: Alton Road & Chase Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	34	10	62	0	150	0	971	73	5	1731	0
Future Volume (vph)	93	34	10	62	0	150	0	971	73	5	1731	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0		7.0		6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00		1.00		0.95	1.00		0.95	
Frt	1.00	0.97		1.00		0.85		1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)	1770	1799		1770		1583		3539	1583		3539	
Flt Permitted	0.95	1.00		0.73		1.00		1.00	1.00		0.95	
Satd. Flow (perm)	1770	1799		1352		1583		3539	1583		3371	
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
Adj. Flow (vph)	100	37	11	67	0	161	0	1044	78	5	1861	0
RTOR Reduction (vph)	0	10	0	0	0	101	0	0	9	0	0	0
Lane Group Flow (vph)	100	38	0	67	0	60	0	1044	69	0	1866	0
Turn Type	Perm	NA		Perm		Perm		NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)	10.4	10.4		10.4		10.4		74.5	74.5		74.5	
Effective Green, g (s)	10.4	10.4		10.4		10.4		74.5	74.5		74.5	
Actuated g/C Ratio	0.11	0.11		0.11		0.11		0.76	0.76		0.76	
Clearance Time (s)	7.0	7.0		7.0		7.0		6.0	6.0		6.0	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		1.0	1.0		1.0	
Lane Grp Cap (vph)	188	191		143		168		2693	1204		2565	
v/s Ratio Prot		0.02						0.29				
v/s Ratio Perm	c0.06			0.05		0.04			0.04		c0.55	
v/c Ratio	0.53	0.20		0.47		0.36		0.39	0.06		0.73	
Uniform Delay, d1	41.4	40.0		41.2		40.6		4.0	2.9		6.3	
Progression Factor	1.00	1.00		1.00		1.00		1.00	1.00		1.00	
Incremental Delay, d2	2.2	0.4		1.8		0.9		0.4	0.1		1.8	
Delay (s)	43.7	40.3		42.9		41.6		4.4	3.0		8.1	
Level of Service	D	D		D		D		A	A		A	
Approach Delay (s)		42.6			42.0			4.3			8.1	
Approach LOS		D			D			A			A	

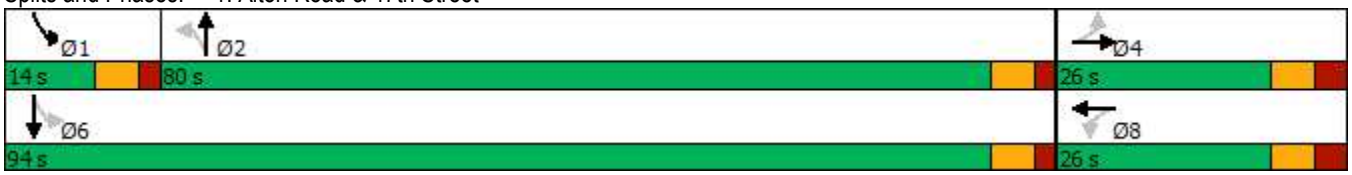
Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	97.9	Sum of lost time (s)	13.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

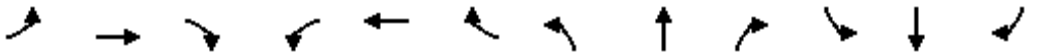
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	18	16	21	11	10	1490	85	1080
Future Volume (vph)	18	16	21	11	10	1490	85	1080
Lane Group Flow (vph)	0	41	0	66	11	1602	89	1140
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	7.0
Minimum Split (s)	25.0	25.0	25.0	25.0	24.0	24.0	11.0	24.0
Total Split (s)	26.0	26.0	26.0	26.0	80.0	80.0	14.0	94.0
Total Split (%)	21.7%	21.7%	21.7%	21.7%	66.7%	66.7%	11.7%	78.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0		7.0	6.0	6.0	6.0	6.0
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Max	Max	None	Max
v/c Ratio		0.32		0.46	0.03	0.60	0.36	0.38
Control Delay		49.8		38.4	6.3	9.6	6.3	3.2
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		49.8		38.4	6.3	9.6	6.3	3.2
Queue Length 50th (ft)		24		23	2	277	9	88
Queue Length 95th (ft)		60		68	9	417	23	141
Internal Link Dist (ft)		184		729		2939		486
Turn Bay Length (ft)					55		115	
Base Capacity (vph)		284		290	349	2662	281	2978
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		0.14		0.23	0.03	0.60	0.32	0.38

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 109.6
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Alton Road & 47th Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	16	5	21	11	30	10	1490	32	85	1080	3
Future Volume (veh/h)	18	16	5	21	11	30	10	1490	32	85	1080	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	19	17	5	22	12	32	11	1568	34	89	1137	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	86	58	13	71	26	49	421	2554	55	301	2970	8
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.06	0.72	0.72	0.72	0.04	0.82	0.82
Sat Flow, veh/h	589	928	211	417	421	789	494	3556	77	1781	3636	10
Grp Volume(v), veh/h	41	0	0	66	0	0	11	782	820	89	556	584
Grp Sat Flow(s),veh/h/ln	1728	0	0	1627	0	0	494	1777	1857	1781	1777	1869
Q Serve(g_s), s	0.0	0.0	0.0	1.8	0.0	0.0	0.7	23.9	24.0	1.2	9.0	9.0
Cycle Q Clear(g_c), s	2.3	0.0	0.0	4.2	0.0	0.0	0.7	23.9	24.0	1.2	9.0	9.0
Prop In Lane	0.46		0.12	0.33		0.48	1.00		0.04	1.00		0.01
Lane Grp Cap(c), veh/h	157	0	0	146	0	0	421	1276	1333	301	1452	1527
V/C Ratio(X)	0.26	0.00	0.00	0.45	0.00	0.00	0.03	0.61	0.61	0.30	0.38	0.38
Avail Cap(c_a), veh/h	335	0	0	323	0	0	421	1276	1333	356	1452	1527
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.4	0.0	0.0	49.2	0.0	0.0	4.4	7.6	7.7	7.1	2.6	2.6
Incr Delay (d2), s/veh	0.7	0.0	0.0	1.6	0.0	0.0	0.1	2.2	2.1	0.2	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	1.8	0.0	0.0	0.1	8.5	8.9	0.6	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.1	0.0	0.0	50.9	0.0	0.0	4.5	9.9	9.8	7.3	3.4	3.4
LnGrp LOS	D	A	A	D	A	A	A	A	A	A	A	A
Approach Vol, veh/h		41			66			1613			1229	
Approach Delay, s/veh		49.1			50.9			9.8			3.7	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.7	83.3		13.7		94.0		13.7				
Change Period (Y+Rc), s	6.0	6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s	8.0	74.0		19.0		88.0		19.0				
Max Q Clear Time (g_c+I1), s	3.2	26.0		4.3		11.0		6.2				
Green Ext Time (p_c), s	0.0	4.9		0.1		2.8		0.2				

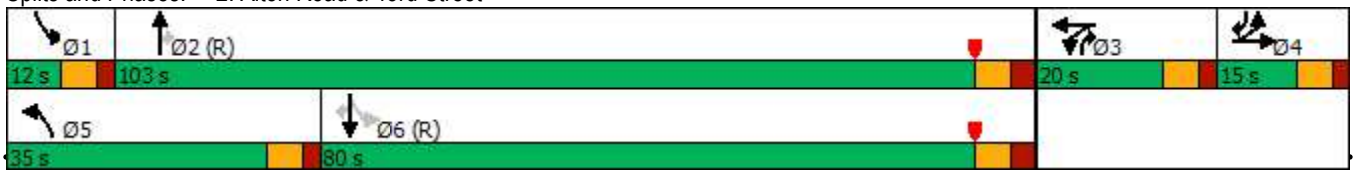
Intersection Summary			
HCM 6th Ctrl Delay		8.7	
HCM 6th LOS		A	

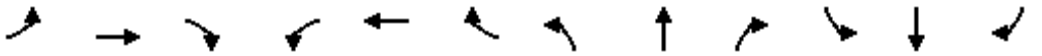
Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	72	166	52	141	1246	55	71	955	55
Future Volume (vph)	72	166	52	141	1246	55	71	955	55
Lane Group Flow (vph)	239	180	73	153	1354	60	77	1038	60
Turn Type	NA	Free	NA	Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4		3	5	2	3	1	6	4
Permitted Phases		Free				2	6		6
Detector Phase	4		3	5	2	3	1	6	4
Switch Phase									
Minimum Initial (s)	7.0		7.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	24.0		24.0	11.0	25.0	24.0	11.0	25.0	24.0
Total Split (s)	15.0		20.0	35.0	103.0	20.0	12.0	80.0	15.0
Total Split (%)	10.0%		13.3%	23.3%	68.7%	13.3%	8.0%	53.3%	10.0%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	7.0	6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None		None	None	C-Max	None	None	C-Max	None
v/c Ratio	1.18dl	0.11	0.53	0.48	0.60	0.05	0.32	0.50	0.05
Control Delay	101.7	0.1	79.8	69.3	17.0	0.8	10.7	19.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	101.7	0.1	79.8	69.3	17.0	0.8	10.7	19.4	0.1
Queue Length 50th (ft)	124	0	70	74	384	0	20	300	0
Queue Length 95th (ft)	#240	0	124	110	449	9	35	377	0
Internal Link Dist (ft)	651		364		2492			2939	
Turn Bay Length (ft)				315		50	130		75
Base Capacity (vph)	265	1583	171	663	2270	1252	242	2077	1098
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	0.90	0.11	0.43	0.23	0.60	0.05	0.32	0.50	0.05

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow
Natural Cycle: 105
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: Alton Road & 43rd Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	72	166	15	52	0	141	1246	55	71	955	55
Future Volume (vph)	148	72	166	15	52	0	141	1246	55	71	955	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0		6.0		6.0	7.0	6.0	6.0	7.0	6.0
Lane Util. Factor		0.95	1.00		1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3424	1583		1843		3433	3539	1583	1770	3539	1583
Flt Permitted		0.97	1.00		0.99		0.95	1.00	1.00	0.16	1.00	1.00
Satd. Flow (perm)		3424	1583		1843		3433	3539	1583	289	3539	1583
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
Adj. Flow (vph)	161	78	180	16	57	0	153	1354	60	77	1038	60
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	17	0	0	20
Lane Group Flow (vph)	0	239	180	0	73	0	153	1354	43	77	1038	40
Turn Type	Split	NA	Free	Split	NA		Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4	4		3	3		5	2	3	1	6	4
Permitted Phases			Free						2	6		6
Actuated Green, G (s)		11.6	150.0		11.4		13.9	96.3	107.7	93.8	88.1	99.7
Effective Green, g (s)		11.6	150.0		11.4		13.9	96.3	107.7	93.8	88.1	99.7
Actuated g/C Ratio		0.08	1.00		0.08		0.09	0.64	0.72	0.63	0.59	0.66
Clearance Time (s)		6.0			6.0		6.0	7.0	6.0	6.0	7.0	6.0
Vehicle Extension (s)		2.5			3.5		5.0	1.0	3.5	2.0	1.0	2.5
Lane Grp Cap (vph)		264	1583		140		318	2272	1136	236	2078	1052
v/s Ratio Prot		c0.07			c0.04		c0.04	c0.38	0.00	0.01	0.29	0.00
v/s Ratio Perm			0.11						0.02	0.19		0.02
v/c Ratio		1.18dl	0.11		0.52		0.48	0.60	0.04	0.33	0.50	0.04
Uniform Delay, d1		68.7	0.0		66.7		64.6	15.6	6.1	12.7	18.1	8.7
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		31.5	0.1		4.0		2.4	1.2	0.0	0.3	0.9	0.0
Delay (s)		100.1	0.1		70.6		67.0	16.7	6.1	13.0	18.9	8.7
Level of Service		F	A		E		E	B	A	B	B	A
Approach Delay (s)		57.2			70.6			21.2			18.0	
Approach LOS		E			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

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

c Critical Lane Group

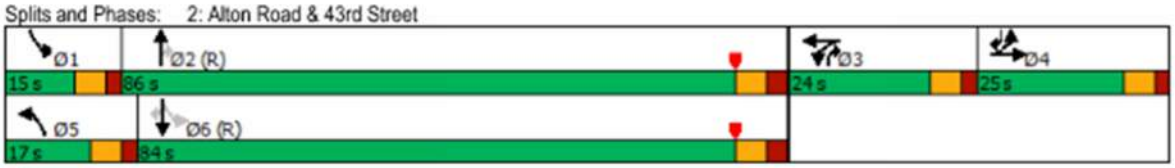
MSMC Cancer Center
Signal Timing Optimization Modifications
17th June 2022
330089601

Alton Road & 43rd Street

Afternoon Peak Hour

Existing Timing

Optimized Timing

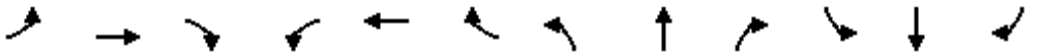


Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	72	166	52	141	1246	55	71	955	55
Future Volume (vph)	72	166	52	141	1246	55	71	955	55
Lane Group Flow (vph)	239	180	73	153	1354	60	77	1038	60
Turn Type	NA	Free	NA	Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4		3	5	2	3	1	6	4
Permitted Phases		Free				2	6		6
Detector Phase	4		3	5	2	3	1	6	4
Switch Phase									
Minimum Initial (s)	7.0		7.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	24.0		24.0	11.0	25.0	24.0	11.0	25.0	24.0
Total Split (s)	25.0		24.0	17.0	86.0	24.0	15.0	84.0	25.0
Total Split (%)	16.7%		16.0%	11.3%	57.3%	16.0%	10.0%	56.0%	16.7%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	7.0	6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None		None	None	C-Max	None	None	C-Max	None
v/c Ratio	0.89dl	0.11	0.51	0.52	0.63	0.05	0.34	0.52	0.06
Control Delay	75.2	0.1	77.8	71.9	21.4	1.5	12.9	22.1	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.2	0.1	77.8	71.9	21.4	1.5	12.9	22.1	1.0
Queue Length 50th (ft)	121	0	70	74	422	0	22	322	0
Queue Length 95th (ft)	165	0	122	114	592	13	47	427	7
Internal Link Dist (ft)	651		364		2492			2939	
Turn Bay Length (ft)				315		50	130		75
Base Capacity (vph)	435	1583	221	299	2152	1241	256	2004	1127
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	0.55	0.11	0.33	0.51	0.63	0.05	0.30	0.52	0.05

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow
Natural Cycle: 105
Control Type: Actuated-Coordinated
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: Alton Road & 43rd Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	72	166	15	52	0	141	1246	55	71	955	55
Future Volume (vph)	148	72	166	15	52	0	141	1246	55	71	955	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0		6.0		6.0	7.0	6.0	6.0	7.0	6.0
Lane Util. Factor		0.95	1.00		1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3424	1583		1843		3433	3539	1583	1770	3539	1583
Flt Permitted		0.97	1.00		0.99		0.95	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)		3424	1583		1843		3433	3539	1583	263	3539	1583
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
Adj. Flow (vph)	161	78	180	16	57	0	153	1354	60	77	1038	60
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	19	0	0	20
Lane Group Flow (vph)	0	239	180	0	73	0	153	1354	41	77	1038	40
Turn Type	Split	NA	Free	Split	NA		Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	4	4		3	3		5	2	3	1	6	4
Permitted Phases			Free						2	6		6
Actuated Green, G (s)		15.3	150.0		11.8		13.0	91.2	103.0	91.6	84.9	100.2
Effective Green, g (s)		15.3	150.0		11.8		13.0	91.2	103.0	91.6	84.9	100.2
Actuated g/C Ratio		0.10	1.00		0.08		0.09	0.61	0.69	0.61	0.57	0.67
Clearance Time (s)		6.0			6.0		6.0	7.0	6.0	6.0	7.0	6.0
Vehicle Extension (s)		2.5			3.5		5.0	1.0	3.5	2.0	1.0	2.5
Lane Grp Cap (vph)		349	1583		144		297	2151	1086	227	2003	1057
v/s Ratio Prot		c0.07			c0.04		c0.04	c0.38	0.00	0.02	0.29	0.00
v/s Ratio Perm			0.11						0.02	0.19		0.02
v/c Ratio		0.89dl	0.11		0.51		0.52	0.63	0.04	0.34	0.52	0.04
Uniform Delay, d1		65.0	0.0		66.3		65.5	18.7	7.6	14.6	20.0	8.5
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		5.0	0.1		3.3		3.0	1.4	0.0	0.3	1.0	0.0
Delay (s)		70.0	0.1		69.6		68.5	20.1	7.6	14.9	21.0	8.5
Level of Service		E	A		E		E	C	A	B	C	A
Approach Delay (s)		40.0			69.6			24.3			19.9	
Approach LOS		D			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

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

Intersection: 1: Alton Road & 47th Street

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	49	97	29	238	206	61	128	106
Average Queue (ft)	31	56	6	95	96	31	74	44
95th Queue (ft)	48	105	25	231	221	59	141	107
Link Distance (ft)	220	747		2955	2955		517	517
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			55			115		
Storage Blk Time (%)				9			2	
Queuing Penalty (veh)				1			1	

Intersection: 2: Alton Road & 43rd Street

Movement	EB	EB	WB	NB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	T	LT	L	L	T	T	R	L	T	T	R
Maximum Queue (ft)	240	182	99	83	122	247	300	75	49	255	273	97
Average Queue (ft)	190	69	50	49	72	129	142	45	32	205	232	19
95th Queue (ft)	252	195	101	84	118	263	308	104	51	273	309	83
Link Distance (ft)	660	660	385			2449	2449			2955	2955	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				315	315			50	130			75
Storage Blk Time (%)							24	0		14	26	0
Queuing Penalty (veh)							13	0		10	14	0

Intersection: 3: Alton Road & 41st Street

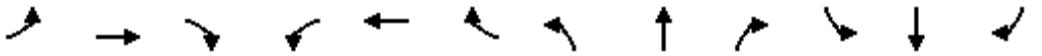
Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	TR	L	T	R
Maximum Queue (ft)	309	484	401	72	600	567	120	347	195	95	91	245
Average Queue (ft)	141	389	303	25	520	489	53	243	126	54	66	155
95th Queue (ft)	280	523	448	76	592	573	143	334	225	106	100	256
Link Distance (ft)		497	497		838	838		284	284		327	327
Upstream Blk Time (%)		0						11				
Queuing Penalty (veh)		0						0				
Storage Bay Dist (ft)	285			120			95			175		
Storage Blk Time (%)		18			47	38						
Queuing Penalty (veh)		25			7	16						

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	141	1305	14	1539	41	238	99	70	73	334
Future Volume (vph)	141	1305	14	1539	41	238	99	70	73	334
Lane Group Flow (vph)	145	1381	14	1587	42	0	407	72	75	344
Turn Type	pm+pt	NA	pm+pt	NA	pm+ov	Perm	NA	pm+pt	NA	Perm
Protected Phases	5	2	1	6	7		8	7	4	
Permitted Phases	2		6		6	8		4		4
Detector Phase	5	2	1	6	7	8	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	11.0	24.0	11.0	24.0	11.0	24.0	24.0	11.0	24.0	24.0
Total Split (s)	12.0	99.0	12.0	99.0	13.0	36.0	36.0	13.0	49.0	49.0
Total Split (%)	7.5%	61.9%	7.5%	61.9%	8.1%	22.5%	22.5%	8.1%	30.6%	30.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	C-Max	None	Max	Max	None	Max	Max
v/c Ratio	1.03	0.62	0.07	0.77	0.04		0.95dl	0.39	0.15	0.70
Control Delay	106.3	20.5	10.5	28.7	1.0		73.7	51.2	45.7	46.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	106.3	20.5	10.5	28.7	1.0		73.7	51.2	45.7	46.8
Queue Length 50th (ft)	~70	405	5	641	0		212	58	60	244
Queue Length 95th (ft)	#169	580	14	736	8		#288	103	107	367
Internal Link Dist (ft)		473		798			261		301	
Turn Bay Length (ft)	285		120		95			175		
Base Capacity (vph)	141	2213	202	2057	1069		504	188	500	491
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	1.03	0.62	0.07	0.77	0.04		0.81	0.38	0.15	0.70

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 118 (74%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
~ 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.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 3: Alton Road & 41st Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	1305	35	14	1539	41	238	99	58	70	73	334
Future Volume (veh/h)	141	1305	35	14	1539	41	238	99	58	70	73	334
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	145	1345	0	14	1587	42	245	102	60	72	75	344
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	187	2147		218	2066	989	228	190	112	240	503	426
Arrive On Green	0.04	0.60	0.00	0.01	0.58	0.58	0.19	0.19	0.19	0.04	0.27	0.27
Sat Flow, veh/h	1781	3647	0	1781	3554	1585	968	1005	591	1781	1870	1585
Grp Volume(v), veh/h	145	1345	0	14	1587	42	245	0	162	72	75	344
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1585	968	0	1596	1781	1870	1585
Q Serve(g_s), s	5.4	38.6	0.0	0.5	54.1	1.6	30.2	0.0	14.7	5.1	4.9	32.4
Cycle Q Clear(g_c), s	5.4	38.6	0.0	0.5	54.1	1.6	30.2	0.0	14.7	5.1	4.9	32.4
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	187	2147		218	2066	989	228	0	301	240	503	426
V/C Ratio(X)	0.78	0.63		0.06	0.77	0.04	1.08	0.00	0.54	0.30	0.15	0.81
Avail Cap(c_a), veh/h	187	2147		259	2066	989	228	0	301	242	503	426
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.6	20.2	0.0	17.1	25.3	11.6	67.9	0.0	58.6	48.6	44.6	54.6
Incr Delay (d2), s/veh	16.7	1.4	0.0	0.0	2.8	0.1	81.4	0.0	6.7	0.3	0.6	15.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	16.3	0.0	0.2	23.3	0.6	14.6	0.0	6.5	2.3	2.4	14.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	21.6	0.0	17.2	28.2	11.7	149.3	0.0	65.3	48.9	45.2	69.7
LnGrp LOS	D	C		B	C	B	F	A	E	D	D	E
Approach Vol, veh/h		1490	A		1643			407			491	
Approach Delay, s/veh		24.0			27.6			115.9			62.9	
Approach LOS		C			C			F			E	

Timer - Assigned Phs	1	2		4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	102.7		49.0	12.0	99.0	12.8	36.2
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	6.0	93.0		43.0	6.0	93.0	7.0	30.0
Max Q Clear Time (g_c+I1), s	2.5	40.6		34.4	7.4	56.1	7.1	32.2
Green Ext Time (p_c), s	0.0	4.7		0.9	0.0	6.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	39.5
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

MSMC Cancer Center
Signal Timing Optimization Modifications
17th June 2022
330089601

Alton Road & 41st Street

Afternoon Peak Hour

Existing Timing

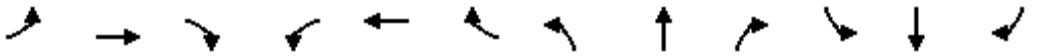
Optimized Timing

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	141	1305	14	1539	41	238	99	70	73	334
Future Volume (vph)	141	1305	14	1539	41	238	99	70	73	334
Lane Group Flow (vph)	145	1381	14	1587	42	0	407	72	75	344
Turn Type	pm+pt	NA	pm+pt	NA	pm+ov	Perm	NA	pm+pt	NA	Perm
Protected Phases	5	2	1	6	7		8	7	4	
Permitted Phases	2		6		6	8		4		4
Detector Phase	5	2	1	6	7	8	8	7	4	4
Switch Phase										
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	11.0	24.0	11.0	24.0	11.0	24.0	24.0	11.0	24.0	24.0
Total Split (s)	19.0	89.0	11.0	81.0	11.0	49.0	49.0	11.0	60.0	60.0
Total Split (%)	11.9%	55.6%	6.9%	50.6%	6.9%	30.6%	30.6%	6.9%	37.5%	37.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	C-Max	None	Max	Max	None	Max	Max
v/c Ratio	0.83	0.70	0.09	0.94	0.05		0.57	0.28	0.12	0.57
Control Delay	72.7	28.6	15.7	51.4	0.1		52.8	40.1	37.3	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	72.7	28.6	15.7	51.4	0.1		52.8	40.1	37.3	34.0
Queue Length 50th (ft)	99	496	6	831	0		189	52	54	209
Queue Length 95th (ft)	#210	680	17	#1002	0		249	93	96	318
Internal Link Dist (ft)		473		798			261		301	
Turn Bay Length (ft)	285		120		95			175		
Base Capacity (vph)	189	1974	150	1690	911		709	253	628	602
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	0.77	0.70	0.09	0.94	0.05		0.57	0.28	0.12	0.57

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 118 (74%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Alton Road & 41st Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	1305	35	14	1539	41	238	99	58	70	73	334
Future Volume (veh/h)	141	1305	35	14	1539	41	238	99	58	70	73	334
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	145	1345	0	14	1587	42	245	102	60	72	75	344
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	166	1903		173	1770	839	305	270	159	328	631	535
Arrive On Green	0.05	0.54	0.00	0.01	0.50	0.50	0.27	0.27	0.27	0.03	0.34	0.34
Sat Flow, veh/h	1781	3647	0	1781	3554	1585	968	1005	591	1781	1870	1585
Grp Volume(v), veh/h	145	1345	0	14	1587	42	245	0	162	72	75	344
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1585	968	0	1596	1781	1870	1585
Q Serve(g_s), s	6.2	45.3	0.0	0.6	64.8	2.0	39.7	0.0	13.2	4.6	4.4	29.4
Cycle Q Clear(g_c), s	6.2	45.3	0.0	0.6	64.8	2.0	39.7	0.0	13.2	4.6	4.4	29.4
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	166	1903		173	1770	839	305	0	429	328	631	535
V/C Ratio(X)	0.87	0.71		0.08	0.90	0.05	0.80	0.00	0.38	0.22	0.12	0.64
Avail Cap(c_a), veh/h	219	1903		203	1770	839	305	0	429	328	631	535
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.2	27.8	0.0	24.1	36.4	18.2	57.3	0.0	47.6	40.2	36.6	44.8
Incr Delay (d2), s/veh	20.8	2.2	0.0	0.1	7.6	0.1	19.7	0.0	2.5	0.1	0.4	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	19.8	0.0	0.3	29.7	0.8	11.4	0.0	5.6	2.1	2.1	12.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.0	30.0	0.0	24.2	44.0	18.3	77.0	0.0	50.1	40.3	37.0	50.7
LnGrp LOS	E	C		C	D	B	E	A	D	D	D	D
Approach Vol, veh/h		1490	A		1643			407			491	
Approach Delay, s/veh		32.6			43.1			66.3			47.1	
Approach LOS		C			D			E			D	

Timer - Assigned Phs	1	2		4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	91.7		60.0	14.3	85.7	11.0	49.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	5.0	83.0		54.0	13.0	75.0	5.0	43.0
Max Q Clear Time (g_c+I1), s	2.6	47.3		31.4	8.2	66.8	6.6	41.7
Green Ext Time (p_c), s	0.0	4.6		1.2	0.1	3.7	0.0	0.4

Intersection Summary		
HCM 6th Ctrl Delay		42.1
HCM 6th LOS		D

Notes

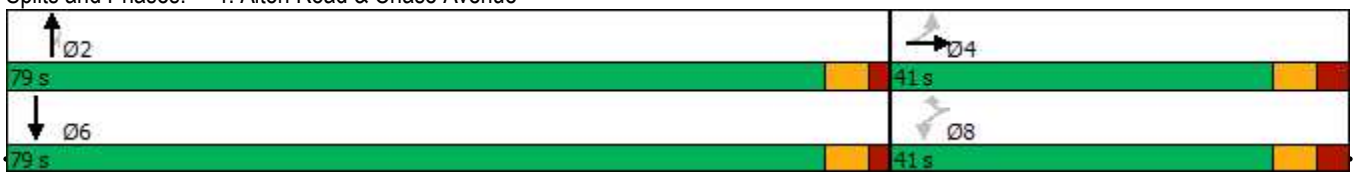
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

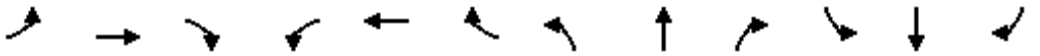
Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBT
Lane Configurations							
Traffic Volume (vph)	200	11	32	231	1782	27	1752
Future Volume (vph)	200	11	32	231	1782	27	1752
Lane Group Flow (vph)	206	13	33	238	1837	28	1809
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4			2		6
Permitted Phases	4		8	8		2	
Detector Phase	4	4	8	8	2	2	6
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	41.0	41.0	41.0	41.0	79.0	79.0	79.0
Total Split (%)	34.2%	34.2%	34.2%	34.2%	65.8%	65.8%	65.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	6.0	6.0	6.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None	None	None	None	Max	Max	Max
v/c Ratio	0.65	0.04	0.13	0.78	0.75	0.03	1.66
Control Delay	49.6	30.7	36.3	53.6	13.5	1.9	319.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	30.7	36.3	53.6	13.5	1.9	319.7
Queue Length 50th (ft)	130	6	19	137	361	0	~930
Queue Length 95th (ft)	205	22	45	223	592	8	#1188
Internal Link Dist (ft)		300			1048		2492
Turn Bay Length (ft)	75		50			45	
Base Capacity (vph)	574	591	452	531	2464	1113	1092
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.02	0.07	0.45	0.75	0.03	1.66

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 105.1
Natural Cycle: 150
Control Type: Semi Act-Uncoord
~ 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.

Splits and Phases: 4: Alton Road & Chase Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	11	2	32	0	231	0	1782	27	3	1752	0
Future Volume (vph)	200	11	2	32	0	231	0	1782	27	3	1752	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0		7.0		6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00		1.00		0.95	1.00		0.95	
Frt	1.00	0.98		1.00		0.85		1.00	0.85		1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00		1.00	
Satd. Flow (prot)	1770	1820		1770		1583		3539	1583		3539	
Flt Permitted	0.95	1.00		0.75		1.00		1.00	1.00		0.95	
Satd. Flow (perm)	1770	1820		1395		1583		3539	1583		3369	
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
Adj. Flow (vph)	206	11	2	33	0	238	0	1837	28	3	1806	0
RTOR Reduction (vph)	0	2	0	0	0	22	0	0	8	0	0	0
Lane Group Flow (vph)	206	11	0	33	0	216	0	1837	20	0	1809	0
Turn Type	Perm	NA		Perm		Perm		NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)	18.9	18.9		18.9		18.9		73.2	73.2		73.2	
Effective Green, g (s)	18.9	18.9		18.9		18.9		73.2	73.2		73.2	
Actuated g/C Ratio	0.18	0.18		0.18		0.18		0.70	0.70		0.70	
Clearance Time (s)	7.0	7.0		7.0		7.0		6.0	6.0		6.0	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		1.0	1.0		1.0	
Lane Grp Cap (vph)	318	327		250		284		2464	1102		2346	
v/s Ratio Prot		0.01						0.52				
v/s Ratio Perm	0.12			0.02		c0.14			0.01		c0.54	
v/c Ratio	0.65	0.03		0.13		0.76		0.75	0.02		0.77	
Uniform Delay, d1	40.0	35.6		36.2		40.9		10.1	4.9		10.5	
Progression Factor	1.00	1.00		1.00		1.00		1.00	1.00		1.00	
Incremental Delay, d2	4.0	0.0		0.2		10.9		2.1	0.0		2.5	
Delay (s)	44.0	35.6		36.4		51.8		12.2	4.9		13.0	
Level of Service	D	D		D		D		B	A		B	
Approach Delay (s)		43.5			49.9			12.1			13.0	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	105.1	Sum of lost time (s)	13.0
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX G
TRIP GENERATION DATA

TRIP GENERATION ANALYSIS
MSMC CANCER CENTER

DAILY

Land Use	ITE Code	Size	Trip Generation Rate	In	Out	Total Trips			Multimodal Reduction Factor (12.6%)			Net New Trips		
						In	Out	Total	In	Out	Total	In	Out	Total
Proposed Uses														
Hospital	610	216,558 SF	T = 10.77 (X)	50%	50%	1,166	1,166	2,332	147	147	294	1,019	1,019	2,038

MORNING PEAK HOUR

Land Use	ITE Code	Size	Trip Generation Rate	In	Out	Total Trips			Multimodal Reduction Factor (12.6%)			Net New Trips		
						In	Out	Total	In	Out	Total	In	Out	Total
Proposed Uses														
Hospital	610	216,558 SF	T = 0.82 (X)	67%	33%	119	59	178	15	7	22	104	52	156

AFTERNOON PEAK HOUR

Land Use	ITE Code	Size	Trip Generation Rate	In	Out	Total Trips			Multimodal Reduction Factor (12.6%)			Net New Trips		
						In	Out	Total	In	Out	Total	In	Out	Total
Proposed Uses														
Hospital	610	216,558 SF	T = 0.86 (X)	35%	65%	65	121	186	8	15	23	57	106	163

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

Hospital
(610)

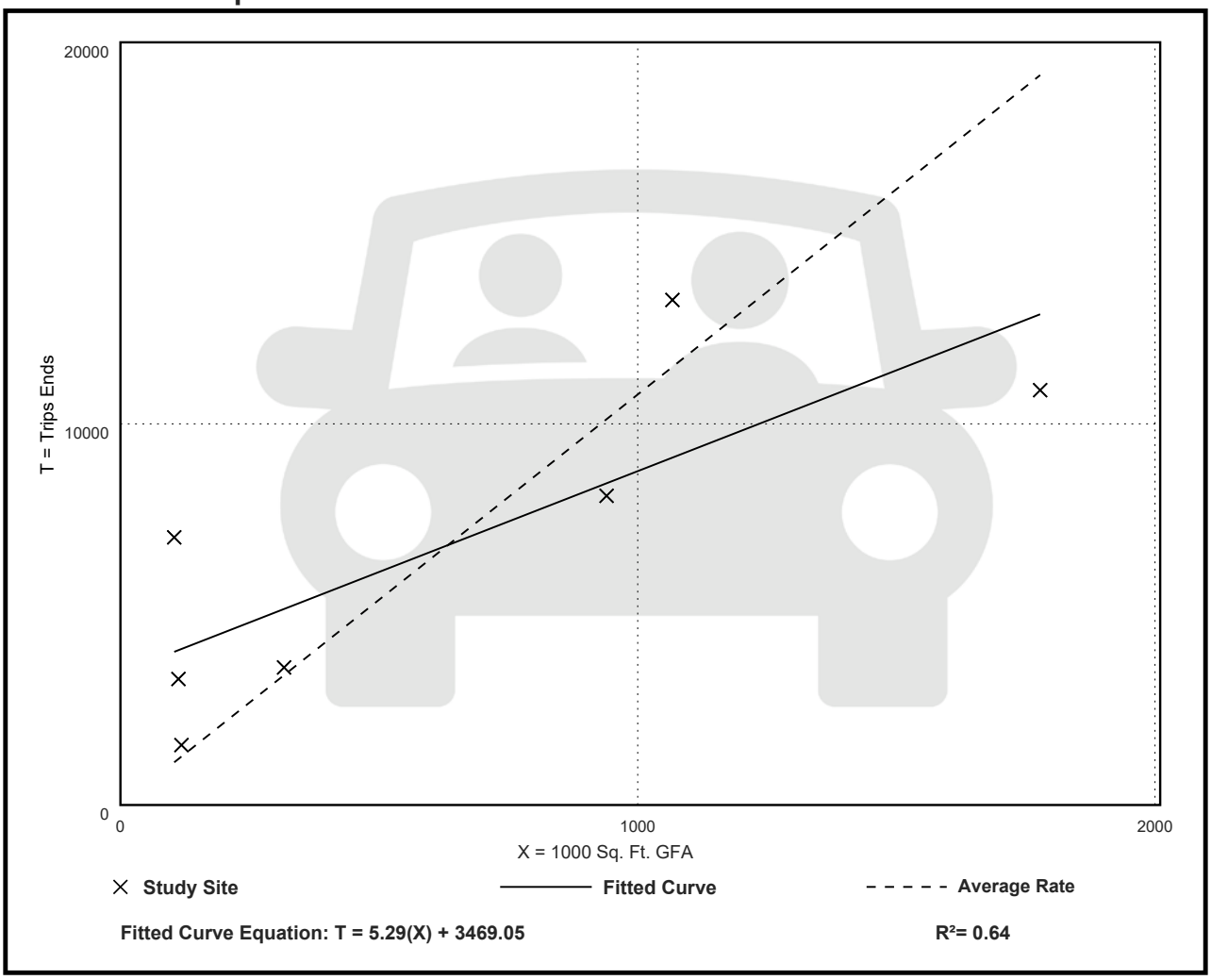
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 7
Avg. 1000 Sq. Ft. GFA: 634
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
10.77	6.12 - 67.52	10.52

Data Plot and Equation



Fitted Curve Equation: T = 5.29(X) + 3469.05

R^2= 0.64

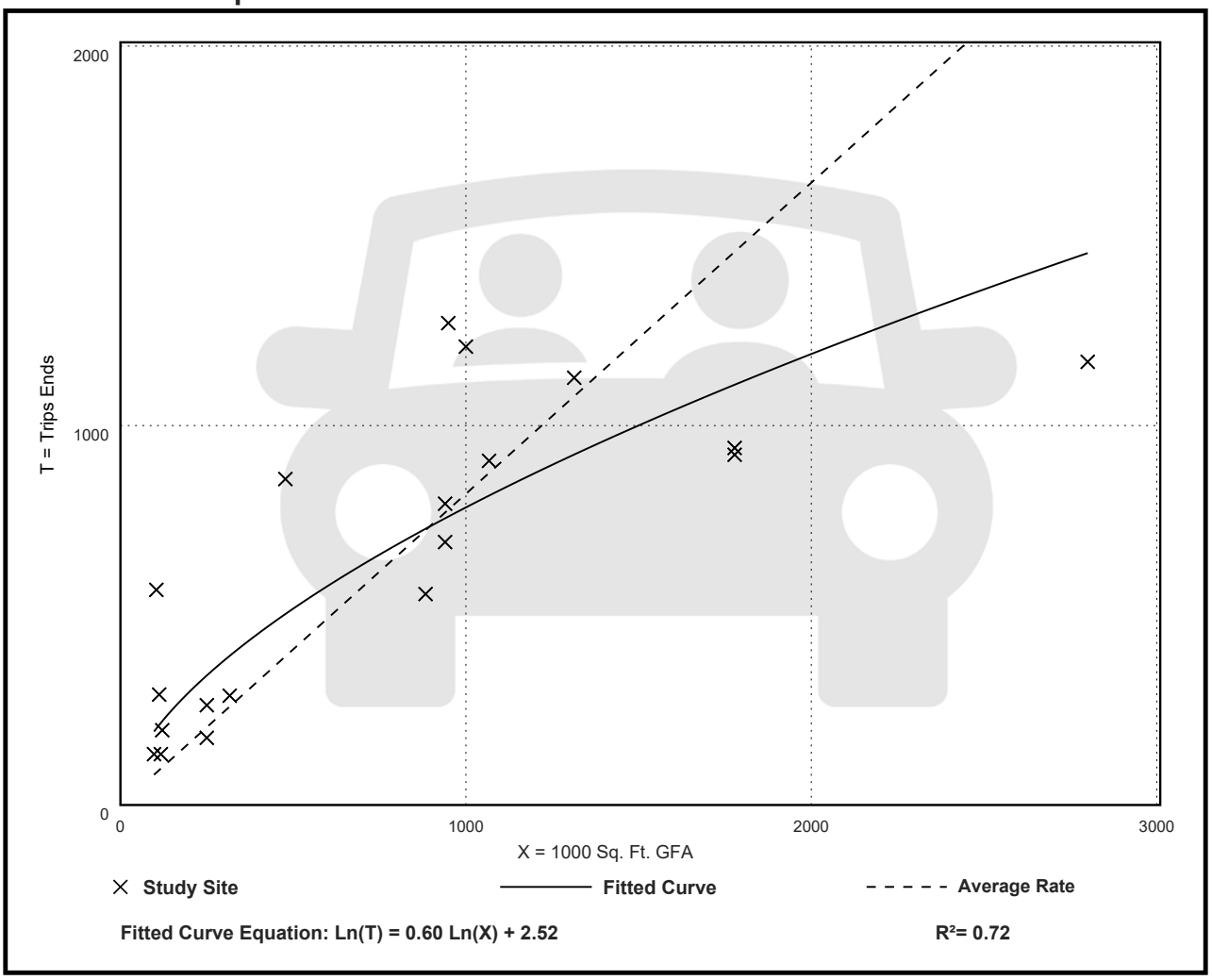
Hospital
(610)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 19
Avg. 1000 Sq. Ft. GFA: 805
Directional Distribution: 67% entering, 33% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.82	0.42 - 5.45	0.55

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.60 Ln(X) + 2.52

R^2= 0.72

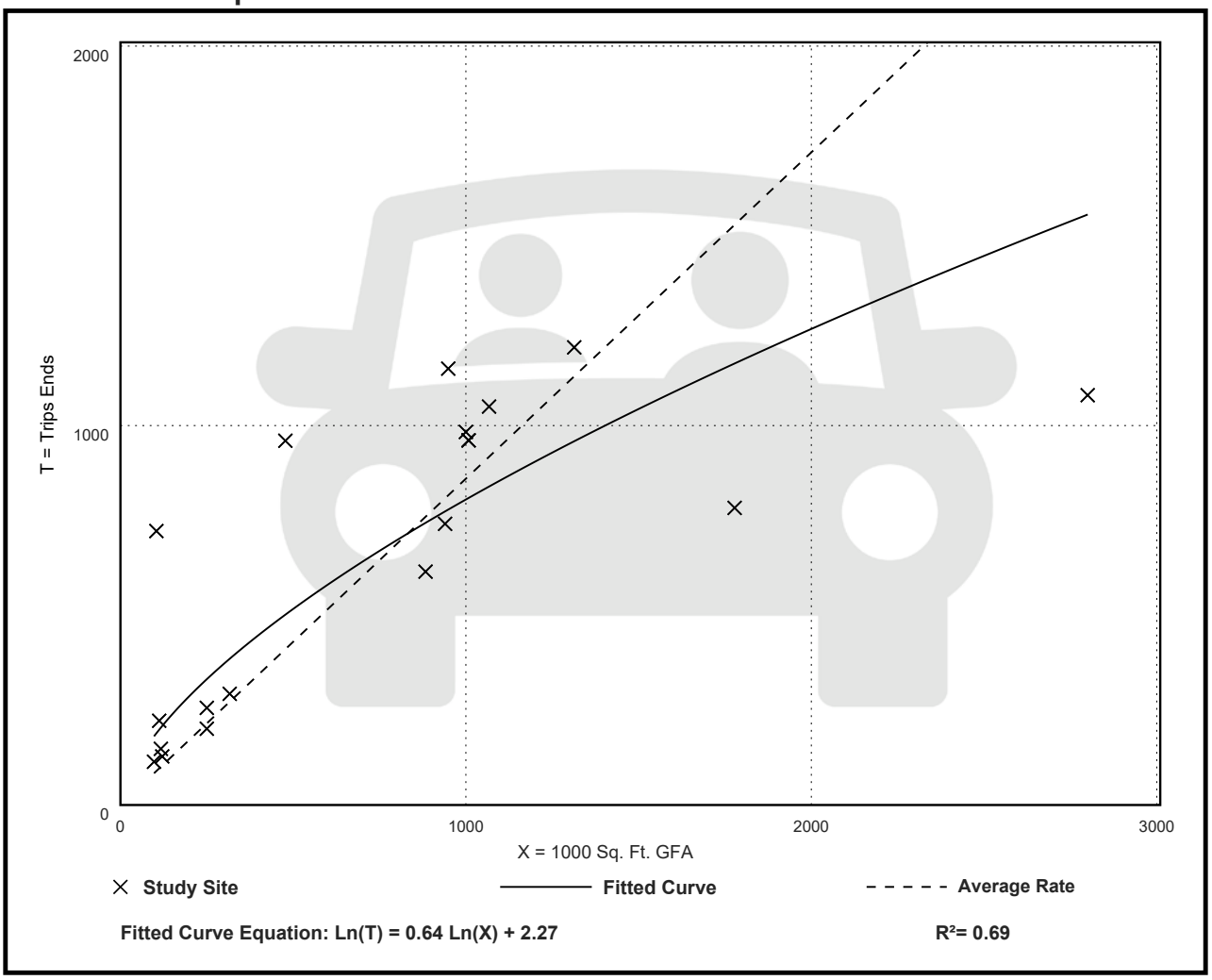
Hospital
(610)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 19
Avg. 1000 Sq. Ft. GFA: 768
Directional Distribution: 35% entering, 65% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.86	0.39 - 6.94	0.65

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.64 Ln(X) + 2.27

R^2= 0.69

APPENDIX H
QUEUING DATA

Prepared by National Data & Surveying Services

Snapshot Queue Study

Location: I-195 WB On-Ramp Bet. I-195 & Edward/Sullivan Dr
City: Miami Beach, FL
Day: Thursday
Date: 5/5/2022

Time	Snapshot Queue Length (# of Vehicles)
	Westbound
	On Ramp
6:00 AM	0
6:01 AM	0
6:02 AM	0
6:03 AM	0
6:04 AM	0
6:05 AM	0
6:06 AM	0
6:07 AM	0
6:08 AM	0
6:09 AM	0
6:10 AM	0
6:11 AM	0
6:12 AM	0
6:13 AM	0
6:14 AM	0
6:15 AM	0
6:16 AM	0
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6:58 PM	0
6:59 PM	0
Average	1

Prepared by National Data & Surveying Services

Snapshot Queue Study

Location: I-195 EB Off-Ramp Bet. I-195 & Alton Rd
City: Miami Beach, FL
Day: Thursday
Date: 5/5/2022

Time	Snapshot Queue Length (# of Vehicles)
	Eastbound
	Off Ramp
6:00 AM	0
6:01 AM	0
6:02 AM	0
6:03 AM	0
6:04 AM	0
6:05 AM	0
6:06 AM	0
6:07 AM	0
6:08 AM	0
6:09 AM	0
6:10 AM	0
6:11 AM	0
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8:23 AM	6
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9:45 AM	0
9:46 AM	0
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9:51 AM	0
9:52 AM	0
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9:57 AM	0

9:58 AM	0
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3:00 PM	0
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5:37 PM	0
5:38 PM	0
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5:40 PM	0
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5:42 PM	0
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5:44 PM	0
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5:47 PM	0
5:48 PM	0
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6:45 PM	0
6:46 PM	0
6:47 PM	0
6:48 PM	0
6:49 PM	0
6:50 PM	0
6:51 PM	0
6:52 PM	0
6:53 PM	0
6:54 PM	0
6:55 PM	0
6:56 PM	0
6:57 PM	0
6:58 PM	0
6:59 PM	0
Totals	1

Prepared by National Data & Surveying Services

Queue Per Cycle

Location: FL-907 (NS) & Alton Rd (EW)
City: Miami Beach, FL
Day: Thursday
Date: 5/5/2022

Time	Snapshot Queue Length (# of Vehicles)			
	Northbound			
	NB Left Lane INSIDE		NB Left Lane OUTSIDE	
	BOG	EOY	BOG	EOY
6:00 AM	2	0	4	0
6:02 AM	0	0	4	0
6:04 AM	1	0	4	0
6:06 AM	0	0	3	0
6:08 AM	1	0	0	0
6:10 AM	1	0	4	0
6:09 AM	4	0	7	1
6:12 AM	3	0	7	0
6:14 AM	1	0	1	1
6:16 AM	2	0	3	1
6:18 AM	4	0	9	0
6:20 AM	7	0	10	0
6:23 AM	4	1	11	1
6:26 AM	7	0	16	0
6:28 AM	3	0	18	0
6:30 AM	5	1	15	1
6:33 AM	8	0	13	0
6:35 AM	2	0	9	0
6:38 AM	6	0	16	0
6:40 AM	9	0	15	0
6:43 AM	5	0	19	3
6:45 AM	2	1	21	4
6:48 AM	7	0	20	0
6:50 AM	5	0	7	0
6:52 AM	12	0	13	0
6:54 AM	7	0	12	0
6:57 AM	3	0	8	0
6:59 AM	9	0	10	0
7:01 AM	3	0	6	0
7:03 AM	4	0	4	0
7:05 AM	3	0	11	0
7:07 AM	4	0	5	0
7:09 AM	6	0	8	0
7:11 AM	4	0	8	0
7:13 AM	3	0	8	0
7:15 AM	11	0	11	0
7:18 AM	4	0	15	0
7:20 AM	2	0	7	0
7:22 AM	2	0	8	0
7:24 AM	4	0	11	0
7:26 AM	7	0	10	0
7:28 AM	6	0	6	0
7:30 AM	5	0	10	0
7:33 AM	6	0	7	0
7:36 AM	4	0	6	0
7:38 AM	8	0	11	0
7:41 AM	11	0	16	0
7:44 AM	9	0	16	0
7:47 AM	8	0	14	0
7:50 AM	6	0	13	0
7:53 AM	3	0	18	1
7:55 AM	6	0	13	0

Time	Snapshot Queue Length (# of Vehicles)			
	Northbound			
	NB Thru Lane INSIDE		NB Thru Lane OUTSIDE	
	BOG	EOY	BOG	EOY
6:01 AM	0	0	0	0
6:03 AM	1	0	2	0
6:04 AM	1	0	0	0
6:06 AM	1	0	0	0
6:07 AM	1	0	0	0
6:09 AM	1	0	0	0
6:10 AM	2	0	0	0
6:12 AM	4	0	1	0
6:14 AM	1	0	1	0
6:16 AM	0	0	0	0
6:18 AM	2	0	1	0
6:20 AM	2	0	1	0
6:23 AM	5	0	2	0
6:25 AM	7	0	5	0
6:28 AM	1	0	0	0
6:30 AM	7	0	1	0
6:33 AM	5	0	5	0
6:35 AM	3	0	2	0
6:38 AM	6	0	3	0
6:41 AM	3	0	3	0
6:43 AM	3	0	5	0
6:46 AM	1	0	0	0
6:48 AM	5	0	6	0
6:50 AM	4	0	0	0
6:52 AM	3	0	1	0
6:54 AM	3	0	2	0
6:57 AM	4	0	2	0
6:59 AM	7	0	4	0
7:01 AM	5	0	5	0
7:03 AM	2	0	1	0
7:05 AM	3	0	3	0
7:07 AM	4	0	0	0
7:09 AM	7	0	2	0
7:11 AM	2	0	2	0
7:13 AM	3	0	3	0
7:15 AM	5	0	4	0
7:18 AM	11	0	9	0
7:20 AM	7	0	3	0
7:22 AM	5	0	3	0
7:24 AM	8	0	7	0
7:26 AM	1	0	4	0
7:28 AM	4	0	3	0
7:30 AM	9	0	11	0
7:33 AM	11	0	8	0
7:36 AM	10	0	7	0
7:39 AM	8	0	11	0
7:42 AM	11	0	6	0
7:44 AM	4	0	5	0
7:47 AM	9	0	5	0
7:50 AM	13	0	11	0
7:53 AM	12	0	10	0
7:56 AM	9	0	6	0

7:58 AM	9	0	12	0
8:01 AM	13	0	19	0
8:04 AM	12	0	14	0
8:07 AM	5	0	7	0
8:10 AM	10	0	15	0
8:12 AM	9	0	3	0
8:15 AM	12	1	19	2
8:18 AM	10	0	19	0
8:22 AM	9	0	18	2
8:24 AM	13	2	18	2
8:28 AM	10	0	17	3
8:31 AM	10	0	15	0
8:34 AM	6	0	13	0
8:37 AM	10	0	8	0
8:39 AM	8	0	16	0
8:42 AM	8	0	11	0
8:45 AM	8	0	4	0
8:48 AM	9	0	11	0
8:51 AM	9	0	13	0
8:54 AM	10	0	10	0
8:57 AM	11	0	10	0
9:00 AM	10	0	9	0
9:03 AM	7	0	3	0
9:06 AM	10	0	10	0
9:09 AM	10	0	6	0
9:11 AM	4	0	8	0
9:14 AM	9	0	5	0
9:18 AM	8	0	4	0
9:20 AM	10	0	8	0
9:23 AM	7	0	7	0
9:26 AM	11	0	10	0
9:29 AM	10	0	7	0
9:32 AM	10	0	9	0
9:35 AM	9	0	12	0
9:38 AM	7	0	10	0
9:41 AM	10	0	12	0
9:44 AM	9	0	7	0
9:47 AM	6	0	8	0
9:50 AM	13	0	8	0
9:53 AM	10	0	6	0
9:56 AM	2	0	2	0
9:59 AM	5	0	5	0
3:00 PM	8	0	6	0
3:02 PM	3	0	3	0
3:04 PM	2	0	3	0
3:06 PM	4	0	6	0
3:08 PM	4	0	3	0
3:10 PM	3	0	5	0
3:12 PM	2	0	5	0
3:15 PM	6	0	3	0
3:17 PM	6	0	3	0
3:19 PM	4	0	4	0
3:21 PM	3	0	3	0
3:23 PM	3	0	2	0
3:25 PM	5	0	3	0
3:27 PM	5	0	1	0
3:29 PM	3	0	0	0
3:32 PM	3	0	4	0
3:33 PM	4	0	4	1
3:35 PM	2	0	0	0
3:37 PM	4	0	2	0
3:39 PM	2	0	1	0
3:41 PM	3	0	1	0
3:43 PM	4	0	2	0

7:58 AM	10	0	6	0
8:01 AM	7	0	5	0
8:04 AM	14	0	5	0
8:07 AM	11	0	10	0
8:09 AM	10	0	7	0
8:13 AM	10	0	6	0
8:15 AM	9	0	6	0
8:19 AM	11	0	9	0
8:22 AM	5	0	6	0
8:25 AM	7	0	6	0
8:28 AM	8	0	12	0
8:31 AM	13	0	11	0
8:34 AM	13	0	12	0
8:37 AM	14	0	7	0
8:39 AM	10	0	7	0
8:42 AM	12	0	12	0
8:45 AM	7	0	4	0
8:48 AM	9	0	7	0
8:51 AM	10	0	8	0
8:54 AM	8	0	6	0
8:57 AM	7	0	9	0
9:00 AM	8	0	10	0
9:03 AM	8	0	9	0
9:06 AM	11	0	9	0
9:09 AM	12	0	10	0
9:12 AM	11	0	8	0
9:15 AM	6	0	8	0
9:18 AM	11	0	9	0
9:20 AM	11	0	8	0
9:23 AM	13	0	8	0
9:26 AM	15	0	9	0
9:29 AM	14	0	6	0
9:32 AM	10	0	9	0
9:35 AM	11	0	9	0
9:39 AM	13	0	9	0
9:42 AM	13	0	11	0
9:44 AM	14	0	12	0
9:47 AM	12	0	12	0
9:50 AM	11	0	8	0
9:54 AM	11	0	9	0
9:56 AM	5	0	3	0
9:59 AM	10	0	8	0
3:00 PM	15	0	12	0
3:02 PM	12	0	10	0
3:04 PM	5	0	4	0
3:06 PM	8	0	10	0
3:08 PM	8	0	7	0
3:10 PM	4	0	4	0
3:12 PM	13	0	9	0
3:15 PM	16	0	14	0
3:17 PM	14	0	12	0
3:19 PM	16	0	11	0
3:21 PM	15	0	12	0
3:23 PM	10	0	7	0
3:25 PM	14	0	12	0
3:28 PM	16	0	8	0
3:30 PM	10	0	7	0
3:32 PM	13	0	12	0
3:33 PM	2	0	3	0
3:35 PM	5	0	4	0
3:37 PM	10	0	8	0
3:40 PM	9	0	8	0
3:41 PM	3	0	1	0
3:43 PM	11	0	8	0

3:45 PM	4	0	2	0
3:47 PM	1	0	0	0
3:49 PM	4	0	0	0
3:51 PM	2	0	1	0
3:53 PM	1	0	3	0
3:55 PM	0	0	1	0
3:57 PM	1	0	2	0
3:59 PM	3	0	3	0
4:01 PM	2	0	0	0
4:03 PM	2	0	3	0
4:05 PM	1	0	0	0
4:07 PM	3	0	5	0
4:09 PM	5	0	2	0
4:11 PM	2	0	0	0
4:13 PM	0	0	1	0
4:15 PM	0	0	1	0
4:17 PM	3	0	1	0
4:19 PM	3	0	1	0
4:21 PM	1	0	2	0
4:23 PM	4	0	2	0
4:26 PM	2	0	1	0
4:28 PM	2	0	4	0
4:30 PM	2	0	1	0
4:32 PM	2	0	2	0
4:34 PM	0	0	2	0
4:36 PM	3	0	2	0
4:38 PM	3	0	1	0
4:40 PM	3	0	5	0
4:42 PM	1	0	2	0
4:44 PM	2	0	2	0
4:46 PM	3	0	0	0
4:48 PM	2	0	2	0
4:50 PM	2	0	1	0
4:52 PM	3	0	0	0
4:54 PM	4	0	2	0
4:56 PM	1	0	2	0
4:58 PM	5	0	1	0

3:45 PM	6	0	6	0
3:47 PM	7	0	5	0
3:49 PM	5	0	3	0
3:51 PM	6	0	8	0
3:53 PM	5	0	3	0
3:55 PM	10	0	8	0
3:57 PM	6	0	4	0
3:59 PM	6	0	5	0
4:01 PM	14	0	11	0
4:03 PM	16	0	12	0
4:05 PM	14	0	14	0
4:08 PM	14	0	12	0
4:10 PM	9	0	6	0
4:12 PM	10	0	12	0
4:13 PM	4	0	2	0
4:16 PM	16	0	11	0
4:18 PM	8	0	6	0
4:19 PM	7	0	3	0
4:21 PM	9	0	5	0
4:23 PM	10	0	8	0
4:25 PM	5	0	3	0
4:26 PM	5	0	4	0
4:28 PM	8	0	5	0
4:31 PM	10	0	9	0
4:32 PM	7	0	4	0
4:34 PM	6	0	5	0
4:36 PM	11	0	8	0
4:38 PM	10	0	7	0
4:40 PM	1	0	1	0
4:42 PM	12	0	9	0
4:44 PM	12	0	5	0
4:46 PM	9	0	5	0
4:48 PM	12	0	7	0
4:50 PM	9	0	9	0
4:52 PM	6	0	4	0
4:54 PM	8	0	5	0
4:56 PM	14	0	11	0

5:00 PM	2	0	1	0
5:03 PM	0	0	1	0
5:05 PM	2	0	3	0
5:07 PM	1	0	2	0
5:09 PM	1	0	1	0
5:11 PM	2	0	2	0
5:13 PM	1	0	3	0
5:15 PM	0	0	2	0
5:17 PM	1	0	3	0
5:20 PM	1	0	0	0
5:22 PM	0	0	1	0
5:24 PM	1	0	2	0
5:26 PM	1	0	1	0
5:28 PM	1	0	0	0
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5:34 PM	1	0	2	0
5:36 PM	1	0	2	0
5:38 PM	0	0	2	0
5:40 PM	2	0	1	0
5:42 PM	2	0	2	0
5:44 PM	1	0	2	0
5:46 PM	4	0	1	0
5:48 PM	4	0	3	0
5:50 PM	1	0	1	0
5:52 PM	3	0	3	0
5:54 PM	0	0	0	0
5:56 PM	3	0	0	0
5:58 PM	2	0	5	0
6:01 PM	5	0	1	0
6:03 PM	3	0	2	0
6:05 PM	1	0	0	0
6:07 PM	3	0	1	0
6:09 PM	2	0	1	0
6:11 PM	1	0	3	0
6:13 PM	1	0	1	0
6:15 PM	1	0	2	0
6:17 PM	2	0	4	0
6:19 PM	0	0	0	0
6:21 PM	2	0	3	0
6:22 PM	3	0	2	0
6:24 PM	5	0	5	0
6:26 PM	3	0	4	0
6:28 PM	3	0	3	0
6:30 PM	2	0	2	0
6:32 PM	3	0	3	0
6:34 PM	7	0	7	0
6:36 PM	4	0	6	0
6:38 PM	1	0	2	0
6:40 PM	2	0	4	0
6:41 PM	9	0	2	0
6:43 PM	8	2	10	0
6:46 PM	10	0	6	0
6:48 PM	9	0	7	0
6:50 PM	4	0	4	0
6:52 PM	6	0	6	0
6:53 PM	2	0	5	0
6:55 PM	6	0	0	0
6:57 PM	4	0	4	0
6:59 PM	5	0	3	0
7:01 PM	6	0	7	0
Totals	5	1	6	1

4:58 PM	5	0	4	0
5:01 PM	10	0	9	0
5:03 PM	6	0	6	0
5:05 PM	11	0	10	0
5:07 PM	6	0	5	0
5:09 PM	14	0	10	0
5:11 PM	2	0	3	0
5:13 PM	6	0	5	0
5:16 PM	10	0	9	0
5:19 PM	2	0	1	0
5:21 PM	6	0	6	0
5:22 PM	5	0	2	0
5:24 PM	14	0	12	0
5:27 PM	13	0	10	0
5:28 PM	5	0	5	0
5:30 PM	5	0	3	0
5:32 PM	11	0	12	0
5:34 PM	10	0	8	0
5:36 PM	10	0	9	0
5:38 PM	8	0	7	0
5:40 PM	12	0	6	0
5:42 PM	8	0	8	0
5:44 PM	15	0	13	0
5:46 PM	9	0	6	0
5:48 PM	8	0	7	0
5:50 PM	8	0	5	0
5:51 PM	12	0	10	0
5:54 PM	16	0	9	0
5:56 PM	16	0	14	0
5:59 PM	14	0	11	0
6:01 PM	11	0	8	0
6:03 PM	7	0	6	0
6:05 PM	12	0	10	0
6:07 PM	12	0	11	0
6:09 PM	10	0	8	0
6:11 PM	12	0	6	0
6:13 PM	6	0	5	0
6:15 PM	14	0	11	0
6:16 PM	10	0	10	0
6:18 PM	12	0	11	0
6:20 PM	8	0	2	0
6:22 PM	12	0	10	0
6:24 PM	2	0	2	0
6:26 PM	10	0	8	0
6:28 PM	11	0	8	0
6:30 PM	6	0	4	0
6:32 PM	7	0	6	0
6:34 PM	11	0	5	0
6:35 PM	2	2	2	0
6:36 PM	10	0	9	0
6:38 PM	12	0	9	0
6:40 PM	7	0	8	0
6:41 PM	7	0	6	0
6:43 PM	4	0	4	0
6:46 PM	10	0	9	0
6:48 PM	8	0	9	0
6:50 PM	8	0	7	0
6:51 PM	2	0	2	0
6:53 PM	2	0	1	0
6:55 PM	6	0	3	0
6:57 PM	7	0	11	0
6:59 PM	6	0	5	0
7:01 PM	5	0	4	0
Totals	9	1	7	0

Prepared by National Data & Surveying Services

Queue Per Cycle

Location: Alton Rd (NS) & W 41st St (EW)
City: Miami Beach, FL
Day: Thursday
Date: 5/5/2022

Time	Snapshot Queue Length (# of Vehicles)			
	Northbound			
	NB Left / Thru Lane		NB Thru Lane	
	BOG	EOY	BOG	EOY
6:00 AM	1	0	0	0
6:03 AM	0	0	1	0
6:05 AM	3	0	0	0
6:07 AM	0	0	0	0
6:10 AM	4	0	0	0
6:12 AM	1	0	0	0
6:14 AM	1	0	1	0
6:17 AM	1	0	0	0
6:19 AM	3	0	0	0
6:21 AM	0	0	0	0
6:24 AM	1	0	0	0
6:26 AM	0	0	0	0
6:29 AM	2	0	2	0
6:31 AM	0	0	1	0
6:33 AM	0	0	0	0
6:35 AM	1	0	3	0
6:38 AM	2	0	0	0
6:41 AM	1	0	1	0
6:43 AM	1	0	0	0
6:45 AM	1	0	2	0
6:47 AM	0	0	1	0
6:50 AM	1	0	2	0
6:52 AM	2	0	0	0
6:54 AM	2	0	1	0
6:57 AM	1	0	0	0
6:59 AM	3	0	0	0
7:01 AM	1	0	1	0
7:03 AM	1	0	0	0
7:06 AM	3	0	0	0
7:08 AM	2	0	0	0
7:11 AM	1	0	0	0
7:13 AM	2	0	2	0
7:15 AM	4	0	4	0
7:17 AM	3	0	1	0
7:20 AM	2	0	1	0
7:23 AM	2	0	1	0

7:25 AM	1	0	0	0
7:27 AM	3	0	5	0
7:30 AM	3	0	2	0
7:32 AM	3	0	4	0
7:34 AM	6	0	7	0
7:37 AM	8	0	6	0
7:39 AM	3	0	3	0
7:41 AM	8	0	3	0
7:44 AM	6	0	6	0
7:46 AM	9	4	8	2
7:49 AM	11	2	9	0
7:51 AM	8	0	4	0
7:53 AM	9	2	3	0
7:55 AM	2	0	3	0
7:58 AM	5	0	4	0
8:00 AM	2	0	3	0
8:02 AM	2	0	4	0
8:04 AM	2	0	3	0
8:07 AM	7	0	3	0
8:09 AM	4	0	2	0
8:11 AM	2	0	1	0
8:14 AM	2	0	4	0
8:17 AM	3	0	4	0
8:19 AM	3	0	2	0
8:21 AM	5	0	2	0
8:24 AM	5	0	4	0
8:26 AM	2	0	3	0
8:28 AM	4	0	2	0
8:30 AM	3	0	4	0
8:33 AM	6	0	6	0
8:35 AM	3	0	4	0
8:37 AM	1	0	5	0
8:40 AM	4	0	5	0
8:42 AM	3	0	7	0
8:45 AM	4	0	5	0
8:47 AM	2	0	3	0
8:49 AM	8	0	4	0
8:52 AM	6	0	6	0
8:54 AM	8	0	8	0
8:56 AM	8	0	9	0
8:59 AM	4	0	10	2
9:01 AM	3	0	7	1
9:03 AM	5	0	6	0
9:05 AM	3	0	0	0
9:08 AM	3	0	1	0
9:10 AM	2	0	6	0
9:12 AM	5	0	1	0
9:15 AM	3	0	2	0

9:17 AM	4	0	4	0
9:19 AM	3	0	5	0
9:21 AM	3	0	3	0
9:23 AM	1	0	4	0
9:25 AM	2	0	3	0
9:27 AM	7	0	3	0
9:29 AM	2	0	2	0
9:31 AM	2	0	2	0
9:33 AM	3	0	1	0
9:35 AM	2	0	1	0
9:37 AM	3	0	2	0
9:40 AM	3	0	2	0
9:41 AM	1	0	4	0
9:43 AM	1	0	3	0
9:46 AM	2	0	1	0
9:48 AM	1	0	2	0
9:50 AM	9	0	8	0
9:52 AM	5	0	4	0
9:53 AM	5	0	3	0
9:55 AM	2	0	2	0
9:58 AM	6	0	2	0
3:00 PM	3	0	2	0
3:03 PM	10	2	6	0
3:05 PM	7	1	7	0
3:07 PM	7	3	7	1
3:09 PM	9	0	8	1
3:11 PM	12	5	10	5
3:13 PM	10	1	9	0
3:15 PM	10	0	7	0
3:17 PM	12	3	9	2
3:19 PM	14	11	8	5
3:21 PM	17	8	10	5
3:23 PM	20	16	9	3
3:25 PM	18	12	7	1
3:27 PM	20	5	6	0
3:29 PM	15	7	6	0
3:31 PM	16	9	8	4
3:33 PM	23	8	11	3
3:36 PM	19	9	13	6
3:38 PM	18	2	9	2
3:41 PM	15	0	6	0
3:43 PM	9	0	2	0
3:46 PM	7	0	5	0
3:49 PM	7	1	6	0
3:52 PM	9	0	5	0
3:54 PM	6	0	7	0
3:57 PM	9	4	7	0
3:59 PM	7	2	3	2

4:02 PM	11	3	4	2
4:04 PM	12	1	5	0
4:06 PM	9	2	6	0
4:09 PM	14	4	7	1
4:11 PM	16	9	7	2
4:13 PM	14	11	6	3
4:15 PM	15	5	5	0
4:18 PM	8	0	2	0
4:21 PM	11	0	7	0
4:23 PM	10	3	2	0
4:25 PM	11	0	4	0
4:27 PM	7	0	4	0
4:29 PM	6	0	3	0
4:31 PM	14	8	9	1
4:34 PM	16	7	4	0
4:37 PM	15	3	4	0
4:39 PM	11	4	5	0
4:42 PM	17	14	2	0
4:45 PM	18	7	3	0
4:47 PM	14	10	13	2
4:50 PM	15	5	7	2
4:53 PM	15	0	12	0
4:55 PM	8	0	4	0
4:58 PM	9	1	2	0
5:01 PM	10	0	2	0
5:03 PM	14	2	7	0
5:06 PM	12	2	5	0

5:08 PM	9	2	4	0
5:11 PM	12	0	12	0
5:14 PM	11	0	6	0
5:17 PM	12	0	5	0
5:19 PM	16	5	11	2
5:22 PM	17	6	9	2
5:25 PM	18	13	7	2
5:28 PM	19	13	11	4
5:31 PM	18	6	10	3
5:33 PM	24	7	11	2
5:35 PM	21	12	6	1
5:38 PM	20	3	12	0
5:41 PM	18	5	7	0
5:43 PM	19	8	6	3
5:45 PM	16	3	5	0
5:47 PM	13	4	4	0
5:49 PM	11	2	5	0
5:51 PM	7	0	3	0
5:54 PM	8	0	3	0
5:57 PM	8	0	4	0
6:00 PM	7	0	5	0
6:02 PM	4	0	3	1
6:04 PM	6	0	2	0
6:07 PM	7	0	2	0
6:09 PM	5	0	3	0
6:10 PM	9	0	7	0
6:13 PM	13	3	5	0
6:15 PM	17	2	7	0
6:18 PM	10	0	3	0
6:20 PM	21	7	8	3
6:23 PM	12	0	3	0
6:26 PM	6	0	5	0
6:29 PM	4	0	0	0
6:31 PM	6	0	4	0
6:34 PM	4	0	3	0
6:36 PM	3	0	1	0
6:38 PM	2	0	2	0
6:40 PM	3	0	3	0
6:42 PM	3	0	2	0
6:45 PM	4	0	3	0
6:47 PM	6	0	3	0
6:49 PM	4	0	3	0
6:51 PM	5	0	2	0
6:53 PM	7	0	2	0
6:55 PM	5	0	2	0
6:58 PM	5	0	4	0
Totals	**8**	**2**	**5**	**1**

APPENDIX I
GATE QUEUEING ANALYSIS

QUEUING ANALYSIS MSMC CANCER CENTER

Estimated Service Time

Entrance Type	Time (min)
All Patrons	0.13

Peak Hour Trip Generation

Ingress Type	Inbound
All patrons	104
Total	104

Visitor versus Resident Trip Generation Calculation	
Highest Ingress	104
Number of Total Employees/Visitors Peak Hour Inbound	104

Resident Entrance Assignment Breakdown

Entrance No.	Percentage	Assignment
1	50%	52
2	50%	52
	Total	104

Morning Peak Hour North Entrance Queuing Analysis

Peak Hour Arrival Rate (veh/hr): **52**
Probablity of Back-up on Adjacent Street: **5%**
Service Time (min): **0.13**

N	Q	q	r	Q_m	M
1	450	52	0.1156	0.1156	**0.0**

Morning Peak Hour South Entrance Queuing Analysis

Peak Hour Arrival Rate (veh/hr): **52**
Probablity of Back-up on Adjacent Street: **5%**
Service Time (min): **0.13**

N	Q	q	r	Q_m	M
1	450	52	0.1156	0.1156	**0.0**

Required queuing storage equation:

$$M = \frac{\ln(0.05) - \ln(Q_m)}{\ln \rho} - 1$$

where:

N = Number of Lanes
Q = Average Service Rate (veh/hr)
q = Peak Hour Arrival Rate (veh/hr)
r = Coefficient of Utiliation (q/NQ)
Q_m = ITE table value of relationship between queue length, number of attendants and utilization factor (ITE Transportation and Land
M = Queue length which is exceeded 5% of the time (veh)

Table of Q_m Values

r	N=1	2	3	4	6	8	10
0.1	0.1000	0.0182	0.0037	0.0008	0.0000	0.0000	0.0000
0.2	0.2000	0.0666	0.0247	0.0093	0.0015	0.0002	0.0000
0.3	0.3000	0.1385	0.0700	0.0370	0.0111	0.0036	0.0011
0.4	0.4000	0.2286	0.1411	0.0907	0.0400	0.0185	0.0088
0.5	0.5000	0.3333	0.2368	0.1739	0.0991	0.0591	0.0360
0.6	0.6000	0.4501	0.3548	0.2870	0.1965	0.1395	0.1013
0.7	0.7000	0.5766	0.4923	0.4286	0.3359	0.2706	0.2218
0.8	0.8000	0.7111	0.6472	0.5964	0.5178	0.4576	0.4093
0.9	0.9000	0.8526	0.8172	0.7878	0.7401	0.7014	0.6687
1.0	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

* ITE Transportation and Development Table 8.11

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The impact of PARC systems on vehicle capacity is significant. Table 14-17 highlights the service rates of various PARC systems. The service rates are affected by the approach to the access point. Sharp turns reduce the service rate. Figure 14-21 highlights the relationship between the turn radius approach to the access point and the impact on service rate. As the radius decreases, turning speed also decreases, which lowers capacity. For example, turns with a 25-ft. inside radius may reduce service rates by 7 sec. per vehicle. The increase in time per vehicle noted in Figure 14-21 can be added to the PARC service rates (shown as sec. per vehicle) in Table 14-17.

Table 14-17. PARC Service Rates.

	Vehicle/Hour	Seconds/Vehicle
No Pay, No Gate		
Entry—clear access, no controls	800	4.5
Exit—little street traffic, no controls (sensitive to street traffic flow)	400	9
Prepaid Systems—Entry or Exit System		
Card insertion	435	8.3
Proximity card	600	6
Automatic vehicle ID	800	4.5
Pay Per Use—Entry Systems		
Pushbutton ticket spitter	400	9
Auto-spit ticket	450	8
Pay on entry—flat fee, gated, ticketed	200	18
Pay on entry—flat fee, non-gated, ticketed	300	12
Pay Per Use—Exit Systems		
Cashier—cash only, variable rate	135	27
Cashier—flat rate	180	20
Cashier—credit card, online check (telephone), sign	95	38
Cashier—credit card, online check, no sign	110	33
Cashier—credit card, batch check, high speed, no sign	175	21
Validated for free parking	300	12
Pay-on-foot ticket insertion	360	10
License plate recognition	120	30

Note: These service rates can be affected by the curvature of the approach to the parking entrance or exit, the volume of traffic on the street adjacent to the parking facility and the frequency of pedestrian conflicts.

Source: Chrest, Smith, Bhuyan, Monahan and Iqbal. *Parking Structures: Planning, Design, Construction, Maintenance and Repair*, 3rd Edition. New York, NY, USA: Kluwer Academic Publishers, 2001.

2. Arrival and Departure Rates

The vehicle trip generation rate of a parking facility can be linked to its associated land use in most suburban cases. In situations where there is a single land use or a mixed-use site, *Trip Generation: An ITE Informational Report* provides a tool for estimating vehicle trip flow at peak hours in the morning or afternoon.[27]

Many parking situations do not involve a single land use. Table 14-18 provides a comparison of the peak-hour vehicle trip rates (peak a.m. and p.m. average vehicle trip rates from *Trip Generation*) for various land uses to the 85th-percentile peak parking demand (from *Parking Generation*). These ratios represent the number of vehicle trips per parked vehicle—a tool that can be used to estimate arrival and departure rates from a parking facility by multiplying the ratio times the number of spaces.

In central cities, parking lots or structures serve many land uses and commonly fall into short-term parking and long-term parking. Counts of short-term parking facilities provide trip rates per space in the peak hours.