

# **Intersection Capacity Analysis Worksheets**

**OBJECTIVE 1: LEVEL OF SERVICE** (please see Glossary of terms)

**To provide for a safe, convenient, balanced, efficient and effective multi-modal transportation system with a Level of Service (LOS) for multiple transportation modes.**

**Policy 1.1 Basic Level of Service**

The following minimum Level of Service standards shall apply to all State, County and local roads except for designated Federal Interstate Highway System (FIHS), Strategic Intermodal System (SIS), and Transportation Regional Incentive Program (TRIP) (please see Glossary of terms) funded facilities which shall be subject to the Florida Department of Transportation's (FDOT) Level of Service Standards.

- Local roads – LOS Standard D
- Collector roads – LOS Standard D
- Arterial roads - LOS Standard D
- Limited access roads - LOS Standard D

**Policy 1.2: Level of Service for Transportation Concurrency Management Areas**

The following level of service standards shall be established for roadways with certain characteristics as per this policy, and for roadways located within the City's Transportation Concurrency Management Areas (TCMA's):

- a. Where no mass transit service exists, roadways shall operate at or above LOS D;
- b. Where mass transit service having headways of 20 minutes or less is provided within ¼ mile distance, parallel roadways shall operate at no greater than 120 percent of LOS D; (please see glossary of terms)
- c. Where extraordinary transit service classified as Local Circulator or express or peak-hour limited stop bus service having headways of 10 minutes exists, parallel roadways within 1/4 mile, shall operate at no greater than 150 percent of LOS D (please see glossary of terms).

**Policy 1.3: Adhering to Level of Service**

The City shall ensure that no development approvals are issued that would result in traffic volumes surpassing the cumulative allowable areawide service volume based on the sum of the individual roadways' Level of Service Standard within the Transportation Concurrency Management Areas.
























## **Weekday Existing Conditions**

# HCM Signalized Intersection Capacity Analysis

## 1: Ferry Exit/Bridge Road & MacArthur Causeway

Existing (Weekday) AM

10/05/2021
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	45	2976	0	0	1817	17	31	2	0	11	0	14
Future Volume (vph)	45	2976	0	0	1817	17	31	2	0	11	0	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8			6.8	6.8		6.8		6.8	4.0	
Lane Util. Factor	1.00	0.91			0.91	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00		1.00	0.93	
Flpb, ped/bikes	1.00	1.00			1.00	1.00		0.99		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		1.00		1.00	0.86	
Flt Protected	0.95	1.00			1.00	1.00		0.96		0.95	1.00	
Satd. Flow (prot)	1671	5036			5036	1484		1797		1805	0	
Flt Permitted	0.95	1.00			1.00	1.00		0.96		0.95	1.00	
Satd. Flow (perm)	1671	5036			5036	1484		1797		1805	0	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	47	3100	0	0	1893	18	32	2	0	11	0	15
RTOR Reduction (vph)	0	0	0	0	0	4	0	0	0	0	15	0
Lane Group Flow (vph)	47	3100	0	0	1893	14	0	34	0	11	0	0
Confl. Peds. (#/hr)	6		4	4		6	1					1
Confl. Bikes (#/hr)			7			4						
Heavy Vehicles (%)	8%	3%	0%	0%	3%	6%	0%	0%	0%	0%	0%	8%
Turn Type	Prot	NA			NA	Perm	Perm	NA		Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Actuated Green, G (s)	9.7	181.3			164.8	164.8		6.0		3.3	0.0	
Effective Green, g (s)	9.7	181.3			164.8	164.8		6.0		3.3	0.0	
Actuated g/C Ratio	0.05	0.86			0.78	0.78		0.03		0.02	0.00	
Clearance Time (s)		6.8			6.8	6.8		6.8		6.8		
Vehicle Extension (s)		1.0			1.0	1.0		0.2		3.0		
Lane Grp Cap (vph)	76	4327			3933	1159		51		28	0	
v/s Ratio Prot	0.03	c0.62			0.38					c0.01		
v/s Ratio Perm						0.01		0.02				
v/c Ratio	0.62	0.72			0.48	0.01		0.67		0.39	0.00	
Uniform Delay, d1	98.8	5.4			8.1	5.1		101.5		102.9	105.5	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	12.1	1.0			0.4	0.0		22.6		8.9	0.0	
Delay (s)	111.0	6.5			8.5	5.1		124.1		111.7	105.5	
Level of Service	F	A			A	A		F		F	F	
Approach Delay (s)		8.0			8.5			124.1			108.1	
Approach LOS		A			A			F			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			9.5									
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			211.0							34.0		
Intersection Capacity Utilization			Err%									
Analysis Period (min)			15									
c Critical Lane Group												



Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Existing (Weekday) AM

10/07/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	45	2976	0	0	1817	17	31	2	0	11	0	14
Future Volume (vph)	45	2976	0	0	1817	17	31	2	0	11	0	14
Confl. Peds. (#/hr)	6		4	4		6	1					1
Confl. Bikes (#/hr)			7			4						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	3%	0%	0%	3%	6%	0%	0%	0%	0%	0%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	3100	0	0	1893	18	0	34	0	11	15	0
Turn Type	Prot	NA			NA	Perm	Perm	NA		Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Detector Phase	1	6			2	2	7	7		8		
Switch Phase												
Minimum Initial (s)		18.0			18.0	18.0	1.0	1.0		5.0		
Minimum Split (s)		24.8			24.8	24.8	14.0	14.0		20.8		
Total Split (s)		145.0			121.0	121.0	21.0	21.0		21.0		
Total Split (%)		68.7%			57.3%	57.3%	10.0%	10.0%		10.0%		
Yellow Time (s)		4.8			4.8	4.8	4.8	4.8		4.8		
All-Red Time (s)		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		
Total Lost Time (s)		6.8			6.8	6.8		6.8		6.8		
Lead/Lag					Lag	Lag	Lag	Lag				
Lead-Lag Optimize?					Yes	Yes	Yes	Yes				
Recall Mode		C-Max			C-Max	C-Max	None	None		None		
v/c Ratio	0.53	0.69			0.46	0.01		0.61		0.19	0.09	
Control Delay	118.2	6.0			8.4	0.0		140.5		105.9	0.0	
Queue Delay	0.0	0.0			0.5	0.0		0.0		0.0	0.0	
Total Delay	118.2	6.0			8.8	0.0		140.5		105.9	0.0	
Queue Length 50th (ft)	65	293			246	0		48		15	0	
Queue Length 95th (ft)	118	704			460	0		94		43	0	
Internal Link Dist (ft)		886			389			350			366	
Turn Bay Length (ft)	150					100						
Base Capacity (vph)	136	4490			4129	1237		121		121	160	
Starvation Cap Reductn	0	0			1563	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	0.35	0.69			0.74	0.01		0.28		0.09	0.09	

Intersection Summary

Cycle Length: 211

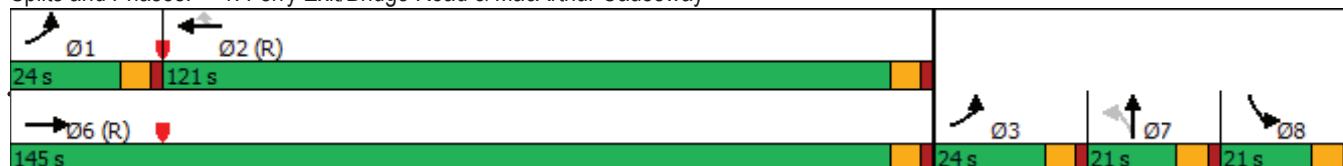
Actuated Cycle Length: 211

Offset: 58 (27%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 1: Ferry Exit/Bridge Road & MacArthur Causeway



Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Existing (Weekday) AM  
10/07/2021



















Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	7.0	1.0
Minimum Split (s)	13.8	23.8
Total Split (s)	24.0	24.0
Total Split (%)	11%	11%
Yellow Time (s)	4.8	4.8
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

# HCM Signalized Intersection Capacity Analysis

## 1: Ferry Exit/Bridge Road & MacArthur Causeway

Existing (Weekday) PM

10/08/2021
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	2168	0	0	2355	10	67	1	1	7	0	35
Future Volume (vph)	10	2168	0	0	2355	10	67	1	1	7	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8			6.8	6.8		6.8		6.8	4.0	
Lane Util. Factor	1.00	0.91			0.91	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00	0.98		1.00		1.00	0.94	
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		1.00		1.00	0.86	
Flt Protected	0.95	1.00			1.00	1.00		0.95		0.95	1.00	
Satd. Flow (prot)	1770	5085			5085	1546		1773		1770	0	
Flt Permitted	0.95	1.00			1.00	1.00		0.95		0.95	1.00	
Satd. Flow (perm)	1770	5085			5085	1546		1773		1770	0	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	11	2436	0	0	2646	11	75	1	1	8	0	39
RTOR Reduction (vph)	0	0	0	0	0	3	0	0	0	0	39	0
Lane Group Flow (vph)	11	2436	0	0	2646	8	0	77	0	8	0	0
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)						4						1
Turn Type	Prot	NA			NA	Perm	Perm	NA		Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Actuated Green, G (s)	6.2	155.3			145.7	145.7		10.9		4.2	0.0	
Effective Green, g (s)	6.2	155.3			145.7	145.7		10.9		4.2	0.0	
Actuated g/C Ratio	0.03	0.77			0.72	0.72		0.05		0.02	0.00	
Clearance Time (s)		6.8			6.8	6.8		6.8		6.8		
Vehicle Extension (s)		1.0			1.0	1.0		0.2		3.0		
Lane Grp Cap (vph)	54	3928			3685	1120		96		36	0	
v/s Ratio Prot	c0.01	c0.48			c0.52					c0.00		
v/s Ratio Perm						0.01		0.04				
v/c Ratio	0.20	0.62			0.72	0.01		0.80		0.22	0.00	
Uniform Delay, d1	95.0	10.0			15.9	7.6		94.0		96.8	100.5	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.7			1.2	0.0		34.9		3.1	0.0	
Delay (s)	96.4	10.7			17.1	7.7		128.9		99.9	100.5	
Level of Service	F	B			B	A		F		F	F	
Approach Delay (s)		11.1			17.1			128.9			100.4	
Approach LOS		B			B			F			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		16.7			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		201.0			Sum of lost time (s)			34.0				
Intersection Capacity Utilization		Err%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

# Timings

## 1: Ferry Exit/Bridge Road & MacArthur Causeway

Existing (Weekday) PM

10/08/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	10	2168	0	0	2355	10	67	1	1	7	0	35
Future Volume (vph)	10	2168	0	0	2355	10	67	1	1	7	0	35
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)						4						1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	2436	0	0	2646	11	0	77	0	8	39	0
Turn Type	Prot	NA			NA	Perm	Perm	NA		Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Detector Phase	1	6			2	2	7	7		8		
Switch Phase												
Minimum Initial (s)		18.0			18.0	18.0	1.0	1.0		5.0		
Minimum Split (s)		24.8			24.8	24.8	14.0	14.0		20.8		
Total Split (s)		135.0			111.0	111.0	21.0	21.0		21.0		
Total Split (%)		67.2%			55.2%	55.2%	10.4%	10.4%		10.4%		
Yellow Time (s)		4.8			4.8	4.8	4.8	4.8		4.8		
All-Red Time (s)		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		
Total Lost Time (s)		6.8			6.8	6.8		6.8		6.8		
Lead/Lag					Lag	Lag	Lag	Lag				
Lead-Lag Optimize?					Yes	Yes	Yes	Yes				
Recall Mode		C-Max			C-Max	C-Max	None	None		None		
v/c Ratio	0.12	0.58			0.66	0.01		0.80		0.12	0.23	
Control Delay	75.2	9.9			15.3	0.0		142.9		94.9	0.0	
Queue Delay	0.0	0.0			1.9	0.0		0.0		0.0	0.0	
Total Delay	75.2	9.9			17.2	0.0		142.9		94.9	0.0	
Queue Length 50th (ft)	14	226			267	0		103		11	0	
Queue Length 95th (ft)	26	816			1153	0		166		32	0	
Internal Link Dist (ft)		886			389			350			366	
Turn Bay Length (ft)	150					100						
Base Capacity (vph)	181	4170			4030	1250		125		125	168	
Starvation Cap Reductn	0	0			1165	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	0.06	0.58			0.92	0.01		0.62		0.06	0.23	

### Intersection Summary

Cycle Length: 201

Actuated Cycle Length: 201

Offset: 9 (4%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 1: Ferry Exit/Bridge Road & MacArthur Causeway



Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Existing (Weekday) PM  
10/08/2021

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	7.0	1.0
Minimum Split (s)	13.8	23.8
Total Split (s)	24.0	24.0
Total Split (%)	12%	12%
Yellow Time (s)	4.8	4.8
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

# HCM Signalized Intersection Capacity Analysis

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

Existing (Weekday) AM

10/11/2021























Movement	EBT	EBR	EBR2	WBL2	WBL	NBL	NWL2	NWL	NWR
Lane Configurations	↑↑↑	↔			↔	↔		↔	
Traffic Volume (vph)	2734	163	93	31	30	0	10	28	1
Future Volume (vph)	2734	163	93	31	30	0	10	28	1
Ideal Flow (vphpl)	1950	1900	1950	1950	1900	1950	1900	1900	1900
Lane Width	12	12	12	8	12	12	12	12	12
Total Lost time (s)	7.3	7.3			6.8			6.0	
Lane Util. Factor	0.91	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.97			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00	
Frt	1.00	0.85			1.00			1.00	
Flt Protected	1.00	1.00			0.95			0.95	
Satd. Flow (prot)	5119	1512			1662			1620	
Flt Permitted	1.00	1.00			0.95			0.95	
Satd. Flow (perm)	5119	1512			1662			1620	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	2848	170	97	32	31	0	10	29	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	36	0
Lane Group Flow (vph)	2848	267	0	0	63	0	0	4	0
Confl. Peds. (#/hr)				9	9			9	5
Confl. Bikes (#/hr)		7	7						
Heavy Vehicles (%)	4%	5%	2%	17%	0%	0%	2%	15%	2%
Turn Type	NA	Perm		Prot	Prot	Prot	Prot	Prot	
Protected Phases	6			5	5	8	3 7	3 7	
Permitted Phases		6							
Actuated Green, G (s)	122.9	122.9			10.8			16.2	
Effective Green, g (s)	122.9	122.9			10.8			16.2	
Actuated g/C Ratio	0.72	0.72			0.06			0.10	
Clearance Time (s)	7.3	7.3			6.8				
Vehicle Extension (s)	1.0	1.0			2.0				
Lane Grp Cap (vph)	3700	1093			105			154	
v/s Ratio Prot	c0.56				c0.04			c0.00	
v/s Ratio Perm		0.18							
v/c Ratio	0.77	0.24			0.60			0.02	
Uniform Delay, d1	14.7	7.9			77.5			69.7	
Progression Factor	1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.6	0.5			6.5			0.1	
Delay (s)	16.3	8.5			84.0			69.8	
Level of Service	B	A			F			E	
Approach Delay (s)	15.6					0.0		69.8	
Approach LOS	B					A		E	
<b>Intersection Summary</b>									
HCM 2000 Control Delay			17.6		HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio			0.74						
Actuated Cycle Length (s)			170.0		Sum of lost time (s)			32.1	
Intersection Capacity Utilization			68.3%		ICU Level of Service			C	
Analysis Period (min)			15						
c Critical Lane Group									

# Timings

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

Existing (Weekday) AM

10/11/2021

												
Lane Group	EBT	EBR	EBR2	WBL2	WBL	NBL	NWL2	NWL	NWR	Ø2	Ø3	Ø7
Lane Configurations	  	 			 	 		 				
Traffic Volume (vph)	2734	163	93	31	30	0	10	28	1			
Future Volume (vph)	2734	163	93	31	30	0	10	28	1			
Confl. Peds. (#/hr)				9	9			9	5			
Confl. Bikes (#/hr)		7	7									
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Heavy Vehicles (%)	4%	5%	2%	17%	0%	0%	2%	15%	2%			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2848	267	0	0	63	0	0	40	0			
Turn Type	NA	Perm		Prot	Prot	Prot	Prot	Prot				
Protected Phases	6			5	5	8	3 7	3 7		2	3	7
Permitted Phases		6										
Detector Phase	6	6		5	5	8	7	7				
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	5.0	10.0				20.0	1.0	7.0
Minimum Split (s)	27.3	27.3		12.3	12.3	16.0				27.3	29.0	13.0
Total Split (s)	77.0	77.0		19.0	19.0	32.0				141.0	29.0	13.0
Total Split (%)	45.3%	45.3%		11.2%	11.2%	18.8%				83%	17%	8%
Yellow Time (s)	4.8	4.8		4.8	4.8	4.0				4.8	4.0	4.0
All-Red Time (s)	2.5	2.5		2.0	2.0	2.0				2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0						
Total Lost Time (s)	7.3	7.3			6.8	6.0						
Lead/Lag	Lead	Lead		Lag	Lag	Lead						Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						Yes
Recall Mode	C-Max	C-Max		None	None	None				C-Max	None	None
v/c Ratio	0.73	0.23			0.60			0.18				
Control Delay	15.8	9.2			99.2			1.7				
Queue Delay	0.0	0.0			0.0			0.0				
Total Delay	15.8	9.2			99.2			1.7				
Queue Length 50th (ft)	521	72			70			0				
Queue Length 95th (ft)	1143	210			123			0				
Internal Link Dist (ft)	231					430		189				
Turn Bay Length (ft)		175										
Base Capacity (vph)	3880	1139			127			223				
Starvation Cap Reductn	0	0			0			0				
Spillback Cap Reductn	0	0			0			0				
Storage Cap Reductn	0	0			0			0				
Reduced v/c Ratio	0.73	0.23			0.50			0.18				

### Intersection Summary

Cycle Length: 170

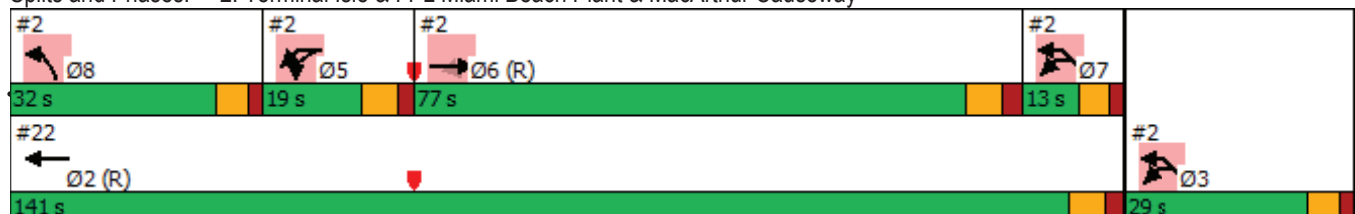
Actuated Cycle Length: 170

Offset: 37 (22%), Referenced to phase 6:EBT and 2:, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway



# HCM Signalized Intersection Capacity Analysis

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

Existing (Weekday) PM

10/11/2021

	→	↗	↘	↙	↖	↗	↘	↙
Movement	EBT	EBR	EBR2	WBL2	WBL	NBL	NWL2	NWL
Lane Configurations	↑↑↑	↑			↓	↓		↓
Traffic Volume (vph)	2126	16	47	18	19	0	1	141
Future Volume (vph)	2126	16	47	18	19	0	1	141
Ideal Flow (vphpl)	1950	1900	1950	1950	1900	1950	1900	1900
Lane Width	12	12	12	8	12	12	12	12
Total Lost time (s)	7.3	7.3			6.8			6.0
Lane Util. Factor	0.91	1.00			1.00			1.00
Frpb, ped/bikes	1.00	0.98			1.00			1.00
Flpb, ped/bikes	1.00	1.00			1.00			1.00
Frt	1.00	0.85			1.00			1.00
Flt Protected	1.00	1.00			0.95			0.95
Satd. Flow (prot)	5219	1550			1703			1753
Flt Permitted	1.00	1.00			0.95			0.95
Satd. Flow (perm)	5219	1550			1703			1753
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	2336	18	52	20	21	0	1	155
RTOR Reduction (vph)	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	2336	70	0	0	41	0	0	156
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)		1	1					
Heavy Vehicles (%)	2%	2%	2%	6%	6%	2%	2%	3%
Turn Type	NA	Perm		Prot	Prot	Prot	Prot	Prot
Protected Phases	6			5	5	8	3 7	3 7
Permitted Phases		6						
Actuated Green, G (s)	115.0	115.0			7.3			17.6
Effective Green, g (s)	115.0	115.0			7.3			17.6
Actuated g/C Ratio	0.72	0.72			0.05			0.11
Clearance Time (s)	7.3	7.3			6.8			
Vehicle Extension (s)	1.0	1.0			2.0			
Lane Grp Cap (vph)	3751	1114			77			192
v/s Ratio Prot	c0.45				c0.02			c0.09
v/s Ratio Perm		0.05						
v/c Ratio	0.62	0.06			0.53			0.81
Uniform Delay, d1	11.5	6.6			74.7			69.6
Progression Factor	1.00	1.00			1.00			1.00
Incremental Delay, d2	0.8	0.1			3.5			22.4
Delay (s)	12.2	6.7			78.2			91.9
Level of Service	B	A			E			F
Approach Delay (s)	12.1					0.0		91.9
Approach LOS	B					A		F
<b>Intersection Summary</b>								
HCM 2000 Control Delay			17.9		HCM 2000 Level of Service			B
HCM 2000 Volume to Capacity ratio			0.70					
Actuated Cycle Length (s)			160.0		Sum of lost time (s)			32.1
Intersection Capacity Utilization			73.0%		ICU Level of Service			D
Analysis Period (min)			15					
c Critical Lane Group								











# Timings

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

Existing (Weekday) PM

10/11/2021

											
Lane Group	EBT	EBR	EBR2	WBL2	WBL	NBL	NWL2	NWL	Ø2	Ø3	Ø7
Lane Configurations	↑↑↑	↑			↓	↓		↓			
Traffic Volume (vph)	2126	16	47	18	19	0	1	141			
Future Volume (vph)	2126	16	47	18	19	0	1	141			
Confl. Peds. (#/hr)											
Confl. Bikes (#/hr)		1	1								
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Heavy Vehicles (%)	2%	2%	2%	6%	6%	2%	2%	3%			
Shared Lane Traffic (%)											
Lane Group Flow (vph)	2336	70	0	0	41	0	0	156			
Turn Type	NA	Perm		Prot	Prot	Prot	Prot	Prot			
Protected Phases	6			5	5	8	3 7	3 7	2	3	7
Permitted Phases		6									
Detector Phase	6	6		5	5	8	7	7			
Switch Phase											
Minimum Initial (s)	20.0	20.0		5.0	5.0	10.0			20.0	1.0	7.0
Minimum Split (s)	27.3	27.3		12.3	12.3	16.0			27.3	29.0	13.0
Total Split (s)	65.0	65.0		16.0	16.0	37.0			131.0	29.0	13.0
Total Split (%)	40.6%	40.6%		10.0%	10.0%	23.1%			82%	18%	8%
Yellow Time (s)	4.8	4.8		4.8	4.8	4.0			4.8	4.0	4.0
All-Red Time (s)	2.5	2.5		2.0	2.0	2.0			2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0					
Total Lost Time (s)	7.3	7.3			6.8	6.0					
Lead/Lag	Lead	Lead		Lag	Lag	Lead					Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes					Yes
Recall Mode	C-Max	C-Max		None	None	None			C-Max	None	None
v/c Ratio	0.59	0.06			0.47			1.11			
Control Delay	11.9	8.1			89.4			169.4			
Queue Delay	0.0	0.0			0.0			0.0			
Total Delay	11.9	8.1			89.4			169.4			
Queue Length 50th (ft)	316	15			43			~255			
Queue Length 95th (ft)	724	57			85			215			
Internal Link Dist (ft)	231					430		189			
Turn Bay Length (ft)		175									
Base Capacity (vph)	3950	1171			104			140			
Starvation Cap Reductn	0	0			0			0			
Spillback Cap Reductn	0	0			0			0			
Storage Cap Reductn	0	0			0			0			
Reduced v/c Ratio	0.59	0.06			0.39			1.11			
<b>Intersection Summary</b>											
Cycle Length: 160											
Actuated Cycle Length: 160											
Offset: 158 (99%), Referenced to phase 6:EBT and 2:, Start of Green											
Natural Cycle: 140											
Control Type: Actuated-Coordinated											
~ Volume exceeds capacity, queue is theoretically infinite.											
Queue shown is maximum after two cycles.											

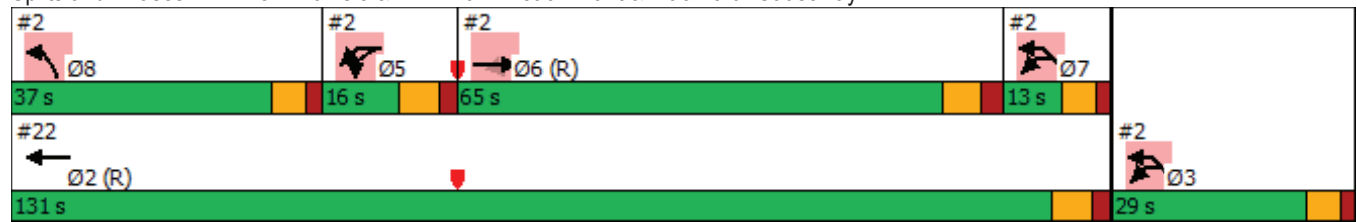
# Timings

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

Existing (Weekday) PM

10/11/2021

Splits and Phases: 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway
























# HCM Signalized Intersection Capacity Analysis

## 3: Alton Road & 5th Street

Existing (Weekday) AM






















10/12/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1112	477	30	714	81	224	146	17	78	153	593
Future Volume (vph)	16	1112	477	30	714	81	224	146	17	78	153	593
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.94	1.00	1.00	0.98	1.00	0.98			1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (prot)		3504	1455	1517	3539	1544	3433	1732			1832	1553
Flt Permitted		0.93	1.00	0.95	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (perm)		3266	1455	1517	3539	1544	3433	1732			1832	1553
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	18	1222	524	33	785	89	246	160	19	86	168	652
RTOR Reduction (vph)	0	0	142	0	0	35	0	3	0	0	0	0
Lane Group Flow (vph)	0	1240	382	33	785	54	246	176	0	0	254	652
Confl. Peds. (#/hr)	3		27	27		3			43	43		
Confl. Bikes (#/hr)			4			5			1			
Heavy Vehicles (%)	0%	3%	4%	19%	2%	3%	2%	7%	0%	0%	3%	4%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Actuated Green, G (s)		96.8	96.8	6.2	109.0	109.0	22.7	22.7			30.3	180.0
Effective Green, g (s)		96.8	96.8	6.2	109.0	109.0	22.7	22.7			30.3	180.0
Actuated g/C Ratio		0.54	0.54	0.03	0.61	0.61	0.13	0.13			0.17	1.00
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	1.0	3.0	3.0			3.5	
Lane Grp Cap (vph)		1756	782	52	2143	934	432	218			308	1553
v/s Ratio Prot				0.02	0.22		0.07	c0.10			c0.14	
v/s Ratio Perm		c0.38	0.26			0.03						c0.42
v/c Ratio		0.71	0.49	0.63	0.37	0.06	0.57	0.81			0.82	0.42
Uniform Delay, d1		31.0	26.1	85.8	18.0	14.5	74.0	76.5			72.3	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2		2.4	2.2	17.1	0.5	0.1	1.7	19.4			16.6	0.8
Delay (s)		33.4	28.3	102.9	18.5	14.6	75.8	95.9			88.9	0.8
Level of Service		C	C	F	B	B	E	F			F	A
Approach Delay (s)		31.9			21.2			84.3			25.5	
Approach LOS		C			C			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			33.6									
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			180.0									
Intersection Capacity Utilization			82.4%									
Analysis Period (min)			15									
c Critical Lane Group												

Timings  
3: Alton Road & 5th Street

Existing (Weekday) AM

10/12/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1112	477	30	714	81	224	146	17	78	153	593
Future Volume (vph)	16	1112	477	30	714	81	224	146	17	78	153	593
Confl. Peds. (#/hr)	3		27	27		3			43	43		
Confl. Bikes (#/hr)			4			5			1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	3%	4%	19%	2%	3%	2%	7%	0%	0%	3%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1240	524	33	785	89	246	179	0	0	254	652
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Detector Phase	2	2	2	1	6	6	3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	35.0	35.0	35.0	11.0	13.0	13.0	23.0	23.0		31.0	31.0	
Total Split (s)	92.0	92.0	92.0	11.0	103.0	103.0	33.0	33.0		44.0	44.0	
Total Split (%)	51.1%	51.1%	51.1%	6.1%	57.2%	57.2%	18.3%	18.3%		24.4%	24.4%	
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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
v/c Ratio		0.70	0.56	0.53	0.37	0.09	0.57	0.81			0.82	0.42
Control Delay		35.3	14.2	110.3	19.8	3.5	78.8	101.6			93.3	0.8
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay		35.3	14.2	110.3	19.8	3.5	78.8	101.6			93.3	0.8
Queue Length 50th (ft)		596	172	39	243	0	142	205			294	0
Queue Length 95th (ft)		740	316	#115	335	29	188	293			386	0
Internal Link Dist (ft)		300			275			278			324	
Turn Bay Length (ft)			225	125								
Base Capacity (vph)		1776	931	62	2142	969	514	262			386	1553
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		0.70	0.56	0.53	0.37	0.09	0.48	0.68			0.66	0.42
<b>Intersection Summary</b>												
Cycle Length: 180												
Actuated Cycle Length: 180												
Offset: 37 (21%), Referenced to phase 2:EBTL and 6:WBT, Start of Green												
Natural Cycle: 110												
Control Type: Actuated-Coordinated												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												

Timings  
3: Alton Road & 5th Street

Existing (Weekday) AM  
10/12/2021

Splits and Phases: 3: Alton Road & 5th Street















# HCM Signalized Intersection Capacity Analysis

## 3: Alton Road & 5th Street













Existing (Weekday) PM

10/12/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑↑	↑
Traffic Volume (vph)	12	653	386	19	1015	133	376	181	21	73	226	666
Future Volume (vph)	12	653	386	19	1015	133	376	181	21	73	226	666
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.94	1.00	1.00	0.99	1.00	0.98			1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (prot)		3492	1484	1480	3539	1563	3433	1805			1840	1559
Flt Permitted		0.92	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (perm)		3223	1484	1480	3539	1563	3433	1805			1840	1559
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)	13	710	420	21	1103	145	409	197	23	79	246	724
RTOR Reduction (vph)	0	0	216	0	0	65	0	3	0	0	0	0
Lane Group Flow (vph)	0	723	204	21	1103	80	409	217	0	0	325	724
Confl. Peds. (#/hr)	1		34	34		1	2		51	51		2
Confl. Bikes (#/hr)			6			1			10			13
Heavy Vehicles (%)	73%	2%	2%	22%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Actuated Green, G (s)		67.9	67.9	3.0	76.9	76.9	18.0	18.0			27.1	140.0
Effective Green, g (s)		67.9	67.9	3.0	76.9	76.9	18.0	18.0			27.1	140.0
Actuated g/C Ratio		0.49	0.49	0.02	0.55	0.55	0.13	0.13			0.19	1.00
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	1.0	3.0	3.0			3.5	
Lane Grp Cap (vph)		1563	719	31	1943	858	441	232			356	1559
v/s Ratio Prot				0.01	c0.31		0.12	c0.12			c0.18	
v/s Ratio Perm		0.22	0.14			0.05						c0.46
v/c Ratio		0.46	0.28	0.68	0.57	0.09	0.93	0.94			0.91	0.46
Uniform Delay, d1		23.9	21.5	68.0	20.7	15.0	60.4	60.4			55.3	0.0
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	1.0	37.4	1.2	0.2	25.5	41.6			27.3	1.0
Delay (s)		24.9	22.5	105.4	21.9	15.2	85.9	102.0			82.6	1.0
Level of Service		C	C	F	C	B	F	F			F	A
Approach Delay (s)		24.0			22.5			91.5			26.3	
Approach LOS		C			C			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			34.5									
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			140.0									
Intersection Capacity Utilization			86.2%									
Analysis Period (min)			15									
c Critical Lane Group												

Timings  
3: Alton Road & 5th Street

Existing (Weekday) PM  
10/12/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑↑	↑
Traffic Volume (vph)	12	653	386	19	1015	133	376	181	21	73	226	666
Future Volume (vph)	12	653	386	19	1015	133	376	181	21	73	226	666
Confl. Peds. (#/hr)	1		34	34		1	2		51	51		2
Confl. Bikes (#/hr)			6			1			10			13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	73%	2%	2%	22%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	723	420	21	1103	145	409	220	0	0	325	724
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Detector Phase	2	2	2	1	6	6	3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	35.0	35.0	35.0	11.0	13.0	13.0	23.0	23.0		31.0	31.0	
Total Split (s)	71.0	71.0	71.0	11.0	82.0	82.0	24.0	24.0		34.0	34.0	
Total Split (%)	50.7%	50.7%	50.7%	7.9%	58.6%	58.6%	17.1%	17.1%		24.3%	24.3%	
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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
v/c Ratio		0.45	0.44	0.40	0.57	0.16	0.93	0.94			0.91	0.46
Control Delay		24.4	3.5	88.4	22.3	2.7	88.1	104.3			85.2	1.0
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay		24.4	3.5	88.4	22.3	2.7	88.1	104.3			85.2	1.0
Queue Length 50th (ft)		235	0	19	339	0	192	199			291	0
Queue Length 95th (ft)		292	58	#49	406	32	#291	#364			#461	0
Internal Link Dist (ft)		300			275			278			324	
Turn Bay Length (ft)			225	125								
Base Capacity (vph)		1618	954	52	1944	923	441	234			368	1559
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		0.45	0.44	0.40	0.57	0.16	0.93	0.94			0.88	0.46
Intersection Summary												
Cycle Length: 140												
Actuated Cycle Length: 140												
Offset: 57 (41%), Referenced to phase 2:EBTL and 6:WBT, Start of Green												
Natural Cycle: 100												
Control Type: Actuated-Coordinated												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												

Timings  
3: Alton Road & 5th Street

Existing (Weekday) PM  
10/12/2021

Splits and Phases: 3: Alton Road & 5th Street





**Intersection**

Int Delay, s/veh 0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑		↗
Traffic Vol, veh/h	2726	0	0	1877	0	19
Future Vol, veh/h	2726	0	0	1877	0	19
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	4	0	0	3	0	17
Mvmt Flow	2840	0	0	1955	0	20

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	-	- 1420
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	- 6.4
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	- -4.0615
Pot Cap-1 Maneuver	-	0	0 - 142
Stage 1	-	0	0 -
Stage 2	-	0	0 -
Platoon blocked, %	-		-
Mov Cap-1 Maneuver	-	-	- 142
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	34.4
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	142	-	-
HCM Lane V/C Ratio	0.139	-	-
HCM Control Delay (s)	34.4	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	0.5	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑			↑		↗
Traffic Vol, veh/h	2124	0	0	37	0	23
Future Vol, veh/h	2124	0	0	37	0	23
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2309	0	0	40	0	25
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	-	1156
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.13
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.919
Pot Cap-1 Maneuver	-	0	0	-	0	164
Stage 1	-	0	0	-	0	-
Stage 2	-	0	0	-	0	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	-	164
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		30.9	
HCM LOS					D	
Minor Lane/Major Mvmt	NBLn1		EBT	WBT		
Capacity (veh/h)	164		-	-		
HCM Lane V/C Ratio	0.152		-	-		
HCM Control Delay (s)	30.9		-	-		
HCM Lane LOS	D		-	-		
HCM 95th %tile Q(veh)	0.5		-	-		
























## **Weekday Future without Project Conditions**

# HCM Signalized Intersection Capacity Analysis

## 1: Ferry Exit/Bridge Road & MacArthur Causeway

Future without Project (Weekday) AM
























10/05/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	45	3036	0	0	1853	17	31	2	0	11	0	14
Future Volume (vph)	45	3036	0	0	1853	17	31	2	0	11	0	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8			6.8	6.8		6.8		6.8	4.0	
Lane Util. Factor	1.00	0.91			0.91	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00		1.00	0.93	
Flpb, ped/bikes	1.00	1.00			1.00	1.00		0.99		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		1.00		1.00	0.86	
Flt Protected	0.95	1.00			1.00	1.00		0.96		0.95	1.00	
Satd. Flow (prot)	1671	5036			5036	1484		1797		1805	0	
Flt Permitted	0.95	1.00			1.00	1.00		0.96		0.95	1.00	
Satd. Flow (perm)	1671	5036			5036	1484		1797		1805	0	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	47	3162	0	0	1930	18	32	2	0	11	0	15
RTOR Reduction (vph)	0	0	0	0	0	4	0	0	0	0	15	0
Lane Group Flow (vph)	47	3163	0	0	1930	14	0	34	0	11	0	0
Confl. Peds. (#/hr)	6		4	4		6	1					1
Confl. Bikes (#/hr)			7			4						
Heavy Vehicles (%)	8%	3%	0%	0%	3%	6%	0%	0%	0%	0%	0%	8%
Turn Type	Prot	NA			NA	Perm	Perm	NA		Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Actuated Green, G (s)	9.7	181.3			164.8	164.8		6.0		3.3	0.0	
Effective Green, g (s)	9.7	181.3			164.8	164.8		6.0		3.3	0.0	
Actuated g/C Ratio	0.05	0.86			0.78	0.78		0.03		0.02	0.00	
Clearance Time (s)		6.8			6.8	6.8		6.8		6.8		
Vehicle Extension (s)		1.0			1.0	1.0		0.2		3.0		
Lane Grp Cap (vph)	76	4327			3933	1159		51		28	0	
v/s Ratio Prot	0.03	c0.63			0.38					c0.01		
v/s Ratio Perm						0.01		0.02				
v/c Ratio	0.62	0.73			0.49	0.01		0.67		0.39	0.00	
Uniform Delay, d1	98.8	5.6			8.2	5.1		101.5		102.9	105.5	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	12.1	1.1			0.4	0.0		22.6		8.9	0.0	
Delay (s)	111.0	6.7			8.6	5.1		124.1		111.7	105.5	
Level of Service	F	A			A	A		F		F	F	
Approach Delay (s)		8.3			8.6			124.1			108.1	
Approach LOS		A			A			F			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			9.6									
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			211.0							34.0		
Intersection Capacity Utilization			Err%									
Analysis Period (min)			15									
c Critical Lane Group												

Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Future without Project (Weekday) AM

10/05/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	45	3036	0	0	1853	17	31	2	0	11	0	14
Future Volume (vph)	45	3036	0	0	1853	17	31	2	0	11	0	14
Confl. Peds. (#/hr)	6		4	4		6	1					1
Confl. Bikes (#/hr)			7			4						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	3%	0%	0%	3%	6%	0%	0%	0%	0%	0%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	3163	0	0	1930	18	0	34	0	11	15	0
Turn Type	Prot	NA			NA	Perm	Perm	NA		Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Detector Phase	1	6			2	2	7	7		8		
Switch Phase												
Minimum Initial (s)		18.0			18.0	18.0	1.0	1.0		5.0		
Minimum Split (s)		24.8			24.8	24.8	14.0	14.0		20.8		
Total Split (s)		145.0			121.0	121.0	21.0	21.0		21.0		
Total Split (%)		68.7%			57.3%	57.3%	10.0%	10.0%		10.0%		
Yellow Time (s)		4.8			4.8	4.8	4.8	4.8		4.8		
All-Red Time (s)		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		
Total Lost Time (s)		6.8			6.8	6.8		6.8		6.8		
Lead/Lag					Lag	Lag	Lag	Lag				
Lead-Lag Optimize?					Yes	Yes	Yes	Yes				
Recall Mode		C-Max			C-Max	C-Max	None	None		None		
v/c Ratio	0.53	0.70			0.47	0.01		0.61		0.19	0.09	
Control Delay	118.2	6.3			8.5	0.0		140.5		105.9	0.0	
Queue Delay	0.0	0.0			0.5	0.0		0.0		0.0	0.0	
Total Delay	118.2	6.3			9.0	0.0		140.5		105.9	0.0	
Queue Length 50th (ft)	65	308			254	0		48		15	0	
Queue Length 95th (ft)	118	741			474	0		94		43	0	
Internal Link Dist (ft)		886			389			350			366	
Turn Bay Length (ft)	150					100						
Base Capacity (vph)	136	4490			4129	1237		121		121	160	
Starvation Cap Reductn	0	0			1544	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	0.35	0.70			0.75	0.01		0.28		0.09	0.09	

Intersection Summary

Cycle Length: 211

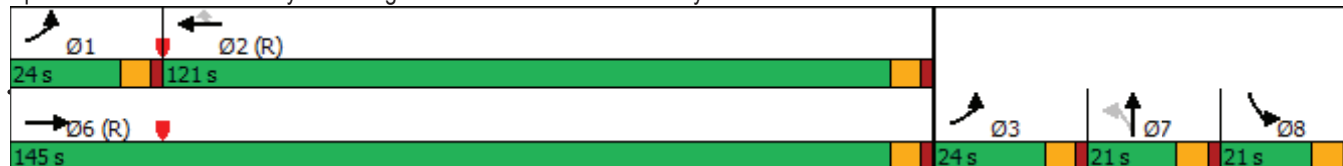
Actuated Cycle Length: 211

Offset: 58 (27%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 1: Ferry Exit/Bridge Road & MacArthur Causeway



Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Future without Project (Weekday) AM

10/05/2021
























Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	7.0	1.0
Minimum Split (s)	13.8	23.8
Total Split (s)	24.0	24.0
Total Split (%)	11%	11%
Yellow Time (s)	4.8	4.8
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

# HCM Signalized Intersection Capacity Analysis

## 1: Ferry Exit/Bridge Road & MacArthur Causeway

Future without Project (Weekday) PM

10/06/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	10	2211	0	0	2403	10	68	1	1	8	0	36
Future Volume (vph)	10	2211	0	0	2403	10	68	1	1	8	0	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8			6.8	6.8		6.8		6.8	4.0	
Lane Util. Factor	1.00	0.91			0.91	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00	0.98		1.00		1.00	0.94	
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		1.00		1.00	0.86	
Flt Protected	0.95	1.00			1.00	1.00		0.95		0.95	1.00	
Satd. Flow (prot)	1770	5085			5085	1546		1773		1770	0	
Flt Permitted	0.95	1.00			1.00	1.00		0.95		0.95	1.00	
Satd. Flow (perm)	1770	5085			5085	1546		1773		1770	0	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	11	2484	0	0	2700	11	76	1	1	9	0	40
RTOR Reduction (vph)	0	0	0	0	0	3	0	0	0	0	40	0
Lane Group Flow (vph)	11	2484	0	0	2700	8	0	78	0	9	0	0
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)						4						1
Turn Type	Prot	NA			NA	Perm	Perm	NA		Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Actuated Green, G (s)	6.2	155.2			145.6	145.6		11.0		4.2	0.0	
Effective Green, g (s)	6.2	155.2			145.6	145.6		11.0		4.2	0.0	
Actuated g/C Ratio	0.03	0.77			0.72	0.72		0.05		0.02	0.00	
Clearance Time (s)		6.8			6.8	6.8		6.8		6.8		
Vehicle Extension (s)		1.0			1.0	1.0		0.2		3.0		
Lane Grp Cap (vph)	54	3926			3683	1119		97		36	0	
v/s Ratio Prot	c0.01	c0.49			c0.53					c0.01		
v/s Ratio Perm						0.01		0.04				
v/c Ratio	0.20	0.63			0.73	0.01		0.80		0.25	0.00	
Uniform Delay, d1	95.0	10.2			16.3	7.7		93.9		96.8	100.5	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.8			1.3	0.0		34.9		3.6	0.0	
Delay (s)	96.4	11.0			17.6	7.7		128.9		100.5	100.5	
Level of Service	F	B			B	A		F		F	F	
Approach Delay (s)		11.4			17.6			128.9			100.5	
Approach LOS		B			B			F			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		17.1			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		201.0			Sum of lost time (s)			34.0				
Intersection Capacity Utilization		Err%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Future without Project (Weekday) PM

10/06/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	2211	0	0	2403	10	68	1	1	8	0	36
Future Volume (vph)	10	2211	0	0	2403	10	68	1	1	8	0	36
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)						4						1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	2484	0	0	2700	11	0	78	0	9	40	0
Turn Type	Prot	NA			NA	Perm	Perm	NA		Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Detector Phase	1	6			2	2	7	7		8		
Switch Phase												
Minimum Initial (s)		18.0			18.0	18.0	1.0	1.0		5.0		
Minimum Split (s)		24.8			24.8	24.8	14.0	14.0		20.8		
Total Split (s)		135.0			111.0	111.0	21.0	21.0		21.0		
Total Split (%)		67.2%			55.2%	55.2%	10.4%	10.4%		10.4%		
Yellow Time (s)		4.8			4.8	4.8	4.8	4.8		4.8		
All-Red Time (s)		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		
Total Lost Time (s)		6.8			6.8	6.8		6.8		6.8		
Lead/Lag					Lag	Lag	Lag	Lag				
Lead-Lag Optimize?					Yes	Yes	Yes	Yes				
Recall Mode		C-Max			C-Max	C-Max	None	None		None		
v/c Ratio	0.12	0.60			0.67	0.01		0.80		0.13	0.24	
Control Delay	75.2	10.2			15.6	0.0		142.7		95.4	0.0	
Queue Delay	0.0	0.0			2.2	0.0		0.0		0.0	0.0	
Total Delay	75.2	10.2			17.8	0.0		142.7		95.4	0.0	
Queue Length 50th (ft)	14	235			280	0		104		12	0	
Queue Length 95th (ft)	26	846			1201	0		167		34	0	
Internal Link Dist (ft)		886			389			350			366	
Turn Bay Length (ft)	150					100						
Base Capacity (vph)	181	4165			4026	1249		125		125	168	
Starvation Cap Reductn	0	0			1137	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	0.06	0.60			0.93	0.01		0.62		0.07	0.24	

Intersection Summary

Cycle Length: 201

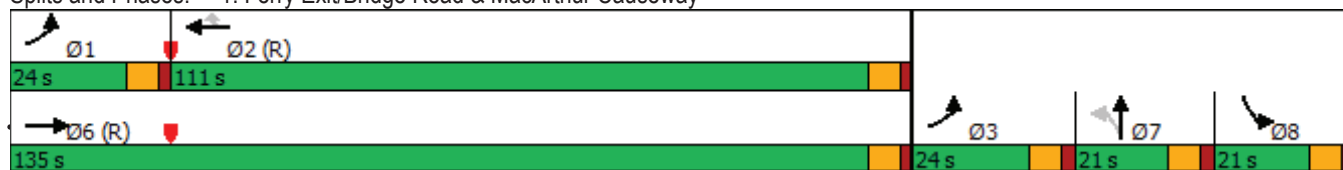
Actuated Cycle Length: 201

Offset: 9 (4%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 1: Ferry Exit/Bridge Road & MacArthur Causeway



DPA



Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Future without Project (Weekday) PM

10/06/2021

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	7.0	1.0
Minimum Split (s)	13.8	23.8
Total Split (s)	24.0	24.0
Total Split (%)	12%	12%
Yellow Time (s)	4.8	4.8
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

# HCM Signalized Intersection Capacity Analysis

Future without Project (Weekday) AM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021

	→	↗	↘	↖	←	↙	↘	↖	↗
Movement	EBT	EBR	EBR2	WBL2	WBL	NBL	NWL2	NWL	NWR
Lane Configurations	↑↑↑	↗			↘	↙		↖	
Traffic Volume (vph)	2789	167	95	31	30	0	10	28	1
Future Volume (vph)	2789	167	95	31	30	0	10	28	1
Ideal Flow (vphpl)	1950	1900	1950	1950	1900	1950	1900	1900	1900
Lane Width	12	12	12	8	12	12	12	12	12
Total Lost time (s)	7.3	7.3			6.8			6.0	
Lane Util. Factor	0.91	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.97			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00	
Frt	1.00	0.85			1.00			1.00	
Flt Protected	1.00	1.00			0.95			0.95	
Satd. Flow (prot)	5119	1512			1662			1620	
Flt Permitted	1.00	1.00			0.95			0.95	
Satd. Flow (perm)	5119	1512			1662			1620	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	2905	174	99	32	31	0	10	29	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	36	0
Lane Group Flow (vph)	2905	273	0	0	63	0	0	4	0
Confl. Peds. (#/hr)				9	9			9	5
Confl. Bikes (#/hr)		7	7						
Heavy Vehicles (%)	4%	5%	2%	17%	0%	0%	2%	15%	2%
Turn Type	NA	Perm		Prot	Prot	Prot	Prot	Prot	
Protected Phases	6			5	5	8	3 7	3 7	
Permitted Phases		6							
Actuated Green, G (s)	122.9	122.9			10.8			16.2	
Effective Green, g (s)	122.9	122.9			10.8			16.2	
Actuated g/C Ratio	0.72	0.72			0.06			0.10	
Clearance Time (s)	7.3	7.3			6.8				
Vehicle Extension (s)	1.0	1.0			2.0				
Lane Grp Cap (vph)	3700	1093			105			154	
v/s Ratio Prot	c0.57				c0.04			c0.00	
v/s Ratio Perm		0.18							
v/c Ratio	0.79	0.25			0.60			0.02	
Uniform Delay, d1	15.1	8.0			77.5			69.7	
Progression Factor	1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.7	0.5			6.5			0.1	
Delay (s)	16.8	8.5			84.0			69.8	
Level of Service	B	A			F			E	
Approach Delay (s)	16.1					0.0		69.8	
Approach LOS	B					A		E	
<b>Intersection Summary</b>									
HCM 2000 Control Delay			18.1		HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio			0.75						
Actuated Cycle Length (s)			170.0		Sum of lost time (s)			32.1	
Intersection Capacity Utilization			69.4%		ICU Level of Service			C	
Analysis Period (min)			15						










c Critical Lane Group

# Timings

Future without Project (Weekday) AM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021

												
Lane Group	EBT	EBR	EBR2	WBL2	WBL	NBL	NWL2	NWL	NWR	Ø2	Ø3	Ø7
Lane Configurations	↑↑↑	↔			↔	↔		↔				
Traffic Volume (vph)	2789	167	95	31	30	0	10	28	1			
Future Volume (vph)	2789	167	95	31	30	0	10	28	1			
Confl. Peds. (#/hr)				9	9			9	5			
Confl. Bikes (#/hr)		7	7									
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Heavy Vehicles (%)	4%	5%	2%	17%	0%	0%	2%	15%	2%			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2905	273	0	0	63	0	0	40	0			
Turn Type	NA	Perm		Prot	Prot	Prot	Prot	Prot				
Protected Phases	6			5	5	8	3 7	3 7		2	3	7
Permitted Phases		6										
Detector Phase	6	6		5	5	8	7	7				
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	5.0	10.0				20.0	1.0	7.0
Minimum Split (s)	27.3	27.3		12.3	12.3	16.0				27.3	29.0	13.0
Total Split (s)	77.0	77.0		19.0	19.0	32.0				141.0	29.0	13.0
Total Split (%)	45.3%	45.3%		11.2%	11.2%	18.8%				83%	17%	8%
Yellow Time (s)	4.8	4.8		4.8	4.8	4.0				4.8	4.0	4.0
All-Red Time (s)	2.5	2.5		2.0	2.0	2.0				2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0						
Total Lost Time (s)	7.3	7.3			6.8	6.0						
Lead/Lag	Lead	Lead		Lag	Lag	Lead						Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						Yes
Recall Mode	C-Max	C-Max		None	None	None				C-Max	None	None
v/c Ratio	0.75	0.24			0.60			0.18				
Control Delay	16.1	9.3			99.2			1.7				
Queue Delay	0.0	0.0			0.0			0.0				
Total Delay	16.1	9.3			99.2			1.7				
Queue Length 50th (ft)	545	74			70			0				
Queue Length 95th (ft)	#1216	214			123			0				
Internal Link Dist (ft)	231					430		189				
Turn Bay Length (ft)		175										
Base Capacity (vph)	3880	1139			127			223				
Starvation Cap Reductn	0	0			0			0				
Spillback Cap Reductn	0	0			0			0				
Storage Cap Reductn	0	0			0			0				
Reduced v/c Ratio	0.75	0.24			0.50			0.18				
<b>Intersection Summary</b>												
Cycle Length: 170												
Actuated Cycle Length: 170												
Offset: 37 (22%), Referenced to phase 6:EBT and 2:, Start of Green												
Natural Cycle: 150												
Control Type: Actuated-Coordinated												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												

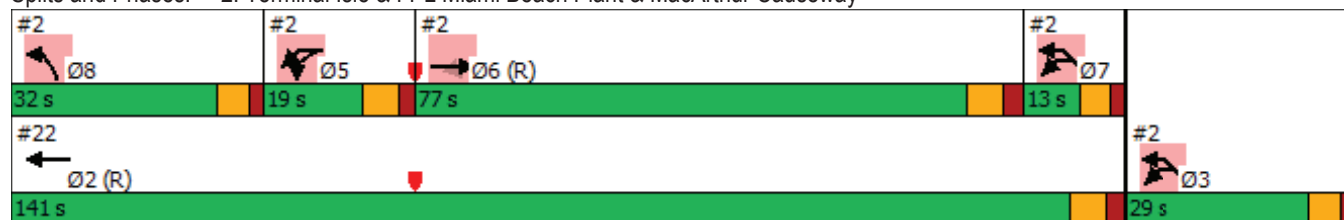
# Timings

Future without Project (Weekday) AM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021

Splits and Phases: 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway



# HCM Signalized Intersection Capacity Analysis

Future without Project (Weekday) PM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021









	→	↗	↘	↙	←	↖	↗	↖
Movement	EBT	EBR	EBR2	WBL2	WBL	NBL	NWL2	NWL
Lane Configurations	↑↑↑	↑			↓	↓		↓
Traffic Volume (vph)	2169	16	48	18	19	0	1	144
Future Volume (vph)	2169	16	48	18	19	0	1	144
Ideal Flow (vphpl)	1950	1900	1950	1950	1900	1950	1900	1900
Lane Width	12	12	12	8	12	12	12	12
Total Lost time (s)	7.3	7.3			6.8			6.0
Lane Util. Factor	0.91	1.00			1.00			1.00
Frpb, ped/bikes	1.00	0.98			1.00			1.00
Flpb, ped/bikes	1.00	1.00			1.00			1.00
Frt	1.00	0.85			1.00			1.00
Flt Protected	1.00	1.00			0.95			0.95
Satd. Flow (prot)	5219	1550			1703			1753
Flt Permitted	1.00	1.00			0.95			0.95
Satd. Flow (perm)	5219	1550			1703			1753
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	2384	18	53	20	21	0	1	158
RTOR Reduction (vph)	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	2384	71	0	0	41	0	0	159
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)		1	1					
Heavy Vehicles (%)	2%	2%	2%	6%	6%	2%	2%	3%
Turn Type	NA	Perm		Prot	Prot	Prot	Prot	Prot
Protected Phases	6			5	5	8	3 7	3 7
Permitted Phases		6						
Actuated Green, G (s)	115.0	115.0			7.3			17.6
Effective Green, g (s)	115.0	115.0			7.3			17.6
Actuated g/C Ratio	0.72	0.72			0.05			0.11
Clearance Time (s)	7.3	7.3			6.8			
Vehicle Extension (s)	1.0	1.0			2.0			
Lane Grp Cap (vph)	3751	1114			77			192
v/s Ratio Prot	c0.46				c0.02			c0.09
v/s Ratio Perm		0.05						
v/c Ratio	0.64	0.06			0.53			0.83
Uniform Delay, d1	11.6	6.6			74.7			69.7
Progression Factor	1.00	1.00			1.00			1.00
Incremental Delay, d2	0.8	0.1			3.5			24.4
Delay (s)	12.5	6.7			78.2			94.2
Level of Service	B	A			E			F
Approach Delay (s)	12.3					0.0		94.2
Approach LOS	B					A		F
<b>Intersection Summary</b>								
HCM 2000 Control Delay			18.2		HCM 2000 Level of Service			B
HCM 2000 Volume to Capacity ratio			0.72					
Actuated Cycle Length (s)			160.0		Sum of lost time (s)			32.1
Intersection Capacity Utilization			74.0%		ICU Level of Service			D
Analysis Period (min)			15					
c Critical Lane Group								

# Timings

Future without Project (Weekday) PM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021

											
Lane Group	EBT	EBR	EBR2	WBL2	WBL	NBL	NWL2	NWL	Ø2	Ø3	Ø7
Lane Configurations	↑↑↑	↑			↓	↓		↓			
Traffic Volume (vph)	2169	16	48	18	19	0	1	144			
Future Volume (vph)	2169	16	48	18	19	0	1	144			
Confl. Peds. (#/hr)											
Confl. Bikes (#/hr)		1	1								
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Heavy Vehicles (%)	2%	2%	2%	6%	6%	2%	2%	3%			
Shared Lane Traffic (%)											
Lane Group Flow (vph)	2384	71	0	0	41	0	0	159			
Turn Type	NA	Perm		Prot	Prot	Prot	Prot	Prot			
Protected Phases	6			5	5	8	3 7	3 7	2	3	7
Permitted Phases		6									
Detector Phase	6	6		5	5	8	7	7			
Switch Phase											
Minimum Initial (s)	20.0	20.0		5.0	5.0	10.0			20.0	1.0	7.0
Minimum Split (s)	27.3	27.3		12.3	12.3	16.0			27.3	29.0	13.0
Total Split (s)	65.0	65.0		16.0	16.0	37.0			131.0	29.0	13.0
Total Split (%)	40.6%	40.6%		10.0%	10.0%	23.1%			82%	18%	8%
Yellow Time (s)	4.8	4.8		4.8	4.8	4.0			4.8	4.0	4.0
All-Red Time (s)	2.5	2.5		2.0	2.0	2.0			2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0					
Total Lost Time (s)	7.3	7.3			6.8	6.0					
Lead/Lag	Lead	Lead		Lag	Lag	Lead					Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes					Yes
Recall Mode	C-Max	C-Max		None	None	None			C-Max	None	None
v/c Ratio	0.60	0.06			0.47			1.14			
Control Delay	12.1	8.1			89.4			175.4			
Queue Delay	0.0	0.0			0.0			0.0			
Total Delay	12.1	8.1			89.4			175.4			
Queue Length 50th (ft)	328	15			43			~262			
Queue Length 95th (ft)	750	58			85			218			
Internal Link Dist (ft)	231					430		189			
Turn Bay Length (ft)		175									
Base Capacity (vph)	3950	1171			104			140			
Starvation Cap Reductn	0	0			0			0			
Spillback Cap Reductn	0	0			0			0			
Storage Cap Reductn	0	0			0			0			
Reduced v/c Ratio	0.60	0.06			0.39			1.14			
<b>Intersection Summary</b>											
Cycle Length: 160											
Actuated Cycle Length: 160											
Offset: 158 (99%), Referenced to phase 6:EBT and 2:, Start of Green											
Natural Cycle: 140											
Control Type: Actuated-Coordinated											
~ Volume exceeds capacity, queue is theoretically infinite.											
Queue shown is maximum after two cycles.											

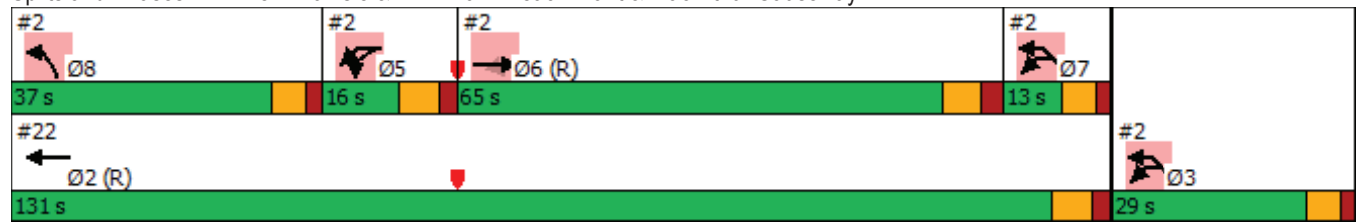
# Timings

Future without Project (Weekday) PM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021

Splits and Phases: 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway
























# HCM Signalized Intersection Capacity Analysis

## 3: Alton Road & 5th Street

Future without Project (Weekday) AM

10/12/2021






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1134	487	30	729	82	228	149	17	80	156	604
Future Volume (vph)	16	1134	487	30	729	82	228	149	17	80	156	604
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.94	1.00	1.00	0.98	1.00	0.98			1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (prot)		3504	1455	1517	3539	1544	3433	1733			1832	1553
Flt Permitted		0.93	1.00	0.95	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (perm)		3265	1455	1517	3539	1544	3433	1733			1832	1553
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	18	1246	535	33	801	90	251	164	19	88	171	664
RTOR Reduction (vph)	0	0	143	0	0	36	0	3	0	0	0	0
Lane Group Flow (vph)	0	1264	392	33	801	54	251	180	0	0	259	664
Confl. Peds. (#/hr)	3		27	27		3			43	43		
Confl. Bikes (#/hr)			4			5			1			
Heavy Vehicles (%)	0%	3%	4%	19%	2%	3%	2%	7%	0%	0%	3%	4%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Actuated Green, G (s)		96.3	96.3	6.1	108.4	108.4	22.9	22.9			30.7	180.0
Effective Green, g (s)		96.3	96.3	6.1	108.4	108.4	22.9	22.9			30.7	180.0
Actuated g/C Ratio		0.54	0.54	0.03	0.60	0.60	0.13	0.13			0.17	1.00
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	1.0	3.0	3.0			3.5	
Lane Grp Cap (vph)		1746	778	51	2131	929	436	220			312	1553
v/s Ratio Prot				0.02	0.23		0.07	c0.10			c0.14	
v/s Ratio Perm		c0.39	0.27			0.04						c0.43
v/c Ratio		0.72	0.50	0.65	0.38	0.06	0.58	0.82			0.83	0.43
Uniform Delay, d1		31.8	26.6	85.9	18.4	14.8	74.0	76.5			72.1	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2		2.6	2.3	19.2	0.5	0.1	1.8	20.7			17.2	0.9
Delay (s)		34.4	29.0	105.1	18.9	14.9	75.8	97.2			89.3	0.9
Level of Service		C	C	F	B	B	E	F			F	A
Approach Delay (s)		32.8			21.6			84.8			25.7	
Approach LOS		C			C			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			34.2									
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			180.0									
Intersection Capacity Utilization			83.3%									
Analysis Period (min)			15									
c Critical Lane Group												



Timings  
3: Alton Road & 5th Street

Future without Project (Weekday) AM

10/12/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1134	487	30	729	82	228	149	17	80	156	604
Future Volume (vph)	16	1134	487	30	729	82	228	149	17	80	156	604
Confl. Peds. (#/hr)	3		27	27		3			43	43		
Confl. Bikes (#/hr)			4			5			1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	3%	4%	19%	2%	3%	2%	7%	0%	0%	3%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1264	535	33	801	90	251	183	0	0	259	664
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Detector Phase	2	2	2	1	6	6	3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	35.0	35.0	35.0	11.0	13.0	13.0	23.0	23.0		31.0	31.0	
Total Split (s)	92.0	92.0	92.0	11.0	103.0	103.0	33.0	33.0		44.0	44.0	
Total Split (%)	51.1%	51.1%	51.1%	6.1%	57.2%	57.2%	18.3%	18.3%		24.4%	24.4%	
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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
v/c Ratio		0.72	0.58	0.54	0.38	0.09	0.58	0.82			0.83	0.43
Control Delay		36.2	14.8	112.0	20.2	3.5	78.8	102.7			93.6	0.9
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay		36.2	14.8	112.0	20.2	3.5	78.8	102.7			93.6	0.9
Queue Length 50th (ft)		621	185	39	253	0	145	210			299	0
Queue Length 95th (ft)		762	332	#115	344	30	192	302			393	0
Internal Link Dist (ft)		300			275			278			324	
Turn Bay Length (ft)			225	125								
Base Capacity (vph)		1767	929	61	2131	965	514	262			386	1553
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		0.72	0.58	0.54	0.38	0.09	0.49	0.70			0.67	0.43

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 37 (21%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Timings  
3: Alton Road & 5th Street

Future without Project (Weekday) AM

10/12/2021

Splits and Phases: 3: Alton Road & 5th Street















# HCM Signalized Intersection Capacity Analysis

## 3: Alton Road & 5th Street

Future without Project (Weekday) PM













10/12/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑↑	↑
Traffic Volume (vph)	12	666	394	19	1036	135	384	185	22	75	230	679
Future Volume (vph)	12	666	394	19	1036	135	384	185	22	75	230	679
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.94	1.00	1.00	0.99	1.00	0.98			1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (prot)		3493	1484	1480	3539	1563	3433	1804			1840	1559
Flt Permitted		0.92	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (perm)		3222	1484	1480	3539	1563	3433	1804			1840	1559
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)	13	724	428	21	1126	147	417	201	24	82	250	738
RTOR Reduction (vph)	0	0	221	0	0	66	0	3	0	0	0	0
Lane Group Flow (vph)	0	737	207	21	1126	81	417	222	0	0	332	738
Confl. Peds. (#/hr)	1		34	34		1	2		51	51		2
Confl. Bikes (#/hr)			6			1			10			13
Heavy Vehicles (%)	73%	2%	2%	22%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Actuated Green, G (s)		67.7	67.7	3.0	76.7	76.7	18.0	18.0			27.3	140.0
Effective Green, g (s)		67.7	67.7	3.0	76.7	76.7	18.0	18.0			27.3	140.0
Actuated g/C Ratio		0.48	0.48	0.02	0.55	0.55	0.13	0.13			0.20	1.00
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	1.0	3.0	3.0			3.5	
Lane Grp Cap (vph)		1558	717	31	1938	856	441	231			358	1559
v/s Ratio Prot				0.01	c0.32		0.12	c0.12			c0.18	
v/s Ratio Perm		0.23	0.14			0.05						c0.47
v/c Ratio		0.47	0.29	0.68	0.58	0.09	0.95	0.96			0.93	0.47
Uniform Delay, d1		24.2	21.7	68.0	21.0	15.1	60.5	60.6			55.4	0.0
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	1.0	37.4	1.3	0.2	29.2	47.1			29.8	1.0
Delay (s)		25.2	22.7	105.4	22.3	15.3	89.7	107.8			85.2	1.0
Level of Service		C	C	F	C	B	F	F			F	A
Approach Delay (s)		24.3			22.8			96.1			27.1	
Approach LOS		C			C			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			35.6									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			140.0								24.0	
Intersection Capacity Utilization			87.6%									ICU Level of Service E
Analysis Period (min)			15									
c Critical Lane Group												

Timings  
3: Alton Road & 5th Street

Future without Project (Weekday) PM

10/12/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑	↗	↖↗	↖			↗↑	↗
Traffic Volume (vph)	12	666	394	19	1036	135	384	185	22	75	230	679
Future Volume (vph)	12	666	394	19	1036	135	384	185	22	75	230	679
Confl. Peds. (#/hr)	1		34	34		1	2		51	51		2
Confl. Bikes (#/hr)			6			1			10			13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	73%	2%	2%	22%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	737	428	21	1126	147	417	225	0	0	332	738
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Detector Phase	2	2	2	1	6	6	3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	35.0	35.0	35.0	11.0	13.0	13.0	23.0	23.0		31.0	31.0	
Total Split (s)	71.0	71.0	71.0	11.0	82.0	82.0	24.0	24.0		34.0	34.0	
Total Split (%)	50.7%	50.7%	50.7%	7.9%	58.6%	58.6%	17.1%	17.1%		24.3%	24.3%	
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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
v/c Ratio		0.46	0.45	0.40	0.58	0.16	0.95	0.96			0.93	0.47
Control Delay		24.7	3.5	88.4	22.6	2.7	91.3	107.6			87.4	1.0
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay		24.7	3.5	88.4	22.6	2.7	91.3	107.6			87.4	1.0
Queue Length 50th (ft)		241	0	19	350	0	196	203			298	0
Queue Length 95th (ft)		298	59	#49	417	32	#299	#372			#476	0
Internal Link Dist (ft)		300			275			278			324	
Turn Bay Length (ft)			225	125								
Base Capacity (vph)		1615	957	52	1940	923	441	235			368	1559
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	0.45	0.40	0.58	0.16	0.95	0.96			0.90	0.47

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 57 (41%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Timings  
3: Alton Road & 5th Street

Future without Project (Weekday) PM

10/12/2021

Splits and Phases: 3: Alton Road & 5th Street



**Intersection**

Int Delay, s/veh 0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑		↗
Traffic Vol, veh/h	2781	0	0	1915	0	19
Future Vol, veh/h	2781	0	0	1915	0	19
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	4	0	0	3	0	17
Mvmt Flow	2897	0	0	1995	0	20

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	-	- 1449
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	-	- 6.4
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	-	- -4.0615
Pot Cap-1 Maneuver	-	0	0 - 137
Stage 1	-	0	0 -
Stage 2	-	0	0 -
Platoon blocked, %	-		-
Mov Cap-1 Maneuver	-	-	- 137
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	35.7
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	137	-	-
HCM Lane V/C Ratio	0.144	-	-
HCM Control Delay (s)	35.7	-	-
HCM Lane LOS	E	-	-
HCM 95th %tile Q(veh)	0.5	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑			↑		↗
Traffic Vol, veh/h	2167	0	0	37	0	24
Future Vol, veh/h	2167	0	0	37	0	24
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2355	0	0	40	0	26
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	-	1179
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.13
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.919
Pot Cap-1 Maneuver	-	0	0	-	0	158
Stage 1	-	0	0	-	0	-
Stage 2	-	0	0	-	0	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	-	158
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		32.2	
HCM LOS					D	
Minor Lane/Major Mvmt	NBLn1		EBT	WBT		
Capacity (veh/h)	158		-	-		
HCM Lane V/C Ratio	0.165		-	-		
HCM Control Delay (s)	32.2		-	-		
HCM Lane LOS	D		-	-		
HCM 95th %tile Q(veh)	0.6		-	-		

## **Weekday Future with Project Conditions**


























# HCM Signalized Intersection Capacity Analysis

## 1: Ferry Exit/Bridge Road & MacArthur Causeway

Future with Project (Weekday) AM

10/05/2021
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	45	3161	0	0	1880	18	31	2	0	15	0	14
Future Volume (vph)	45	3161	0	0	1880	18	31	2	0	15	0	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8			6.8	6.8		6.8		6.8	4.0	
Lane Util. Factor	1.00	0.91			0.91	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00	0.97		1.00		1.00	0.93	
Flpb, ped/bikes	1.00	1.00			1.00	1.00		0.99		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		1.00		1.00	0.86	
Flt Protected	0.95	1.00			1.00	1.00		0.96		0.95	1.00	
Satd. Flow (prot)	1671	5036			5036	1484		1797		1805	0	
Flt Permitted	0.95	1.00			1.00	1.00		0.96		0.95	1.00	
Satd. Flow (perm)	1671	5036			5036	1484		1797		1805	0	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	47	3293	0	0	1958	19	32	2	0	16	0	15
RTOR Reduction (vph)	0	0	0	0	0	4	0	0	0	0	15	0
Lane Group Flow (vph)	47	3293	0	0	1958	15	0	34	0	16	0	0
Confl. Peds. (#/hr)	6		4	4		6	1					1
Confl. Bikes (#/hr)			7			4						
Heavy Vehicles (%)	8%	3%	0%	0%	3%	6%	0%	0%	0%	0%	0%	8%
Turn Type	Prot	NA			NA	Perm	Perm	NA		Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Actuated Green, G (s)	9.7	179.5			163.0	163.0		6.0		5.1	0.0	
Effective Green, g (s)	9.7	179.5			163.0	163.0		6.0		5.1	0.0	
Actuated g/C Ratio	0.05	0.85			0.77	0.77		0.03		0.02	0.00	
Clearance Time (s)		6.8			6.8	6.8		6.8		6.8		
Vehicle Extension (s)		1.0			1.0	1.0		0.2		3.0		
Lane Grp Cap (vph)	76	4284			3890	1146		51		43	0	
v/s Ratio Prot	0.03	c0.65			0.39					c0.01		
v/s Ratio Perm						0.01		0.02				
v/c Ratio	0.62	0.77			0.50	0.01		0.67		0.37	0.00	
Uniform Delay, d1	98.8	6.8			8.9	5.5		101.5		101.4	105.5	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	12.1	1.4			0.5	0.0		22.6		5.4	0.0	
Delay (s)	111.0	8.2			9.4	5.5		124.1		106.7	105.5	
Level of Service	F	A			A	A		F		F	F	
Approach Delay (s)		9.6			9.4			124.1			106.1	
Approach LOS		A			A			F			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			10.8				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			211.0				Sum of lost time (s)			34.0		
Intersection Capacity Utilization			Err%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

# Timings

## 1: Ferry Exit/Bridge Road & MacArthur Causeway

Future with Project (Weekday) AM

10/05/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	45	3161	0	0	1880	18	31	2	0	15	0	14
Future Volume (vph)	45	3161	0	0	1880	18	31	2	0	15	0	14
Confl. Peds. (#/hr)	6		4	4		6	1					1
Confl. Bikes (#/hr)			7			4						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	8%	3%	0%	0%	3%	6%	0%	0%	0%	0%	0%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	3293	0	0	1958	19	0	34	0	16	15	0
Turn Type	Prot	NA			NA	Perm	Perm	NA		Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Detector Phase	1	6			2	2	7	7		8		
Switch Phase												
Minimum Initial (s)		18.0			18.0	18.0	1.0	1.0		5.0		
Minimum Split (s)		24.8			24.8	24.8	14.0	14.0		20.8		
Total Split (s)		145.0			121.0	121.0	21.0	21.0		21.0		
Total Split (%)		68.7%			57.3%	57.3%	10.0%	10.0%		10.0%		
Yellow Time (s)		4.8			4.8	4.8	4.8	4.8		4.8		
All-Red Time (s)		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		
Total Lost Time (s)		6.8			6.8	6.8		6.8		6.8		
Lead/Lag					Lag	Lag	Lag	Lag				
Lead-Lag Optimize?					Yes	Yes	Yes	Yes				
Recall Mode		C-Max			C-Max	C-Max	None	None		None		
v/c Ratio	0.53	0.75			0.48	0.02		0.61		0.25	0.09	
Control Delay	118.2	8.2			9.7	0.0		140.5		108.1	0.0	
Queue Delay	0.0	0.0			0.4	0.0		0.0		0.0	0.0	
Total Delay	118.2	8.2			10.2	0.0		140.5		108.1	0.0	
Queue Length 50th (ft)	65	686			374	0		48		22	0	
Queue Length 95th (ft)	118	847			492	0		94		54	0	
Internal Link Dist (ft)		886			389			350			366	
Turn Bay Length (ft)	150					100						
Base Capacity (vph)	136	4415			4053	1216		121		121	160	
Starvation Cap Reductn	0	0			1388	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	0.35	0.75			0.73	0.02		0.28		0.13	0.09	

### Intersection Summary

Cycle Length: 211

Actuated Cycle Length: 211

Offset: 58 (27%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 1: Ferry Exit/Bridge Road & MacArthur Causeway



Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Future with Project (Weekday) AM

10/05/2021
























Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	7.0	1.0
Minimum Split (s)	13.8	23.8
Total Split (s)	24.0	24.0
Total Split (%)	11%	11%
Yellow Time (s)	4.8	4.8
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

# HCM Signalized Intersection Capacity Analysis

## 1: Ferry Exit/Bridge Road & MacArthur Causeway

Future with Project (Weekday) PM
























10/06/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	10	2278	0	0	2555	14	68	1	1	10	0	36
Future Volume (vph)	10	2278	0	0	2555	14	68	1	1	10	0	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8			6.8	6.8		6.8		6.8	4.0	
Lane Util. Factor	1.00	0.91			0.91	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00	0.98		1.00		1.00	0.94	
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		1.00		1.00	0.86	
Flt Protected	0.95	1.00			1.00	1.00		0.95		0.95	1.00	
Satd. Flow (prot)	1770	5085			5085	1546		1773		1770	0	
Flt Permitted	0.95	1.00			1.00	1.00		0.95		0.95	1.00	
Satd. Flow (perm)	1770	5085			5085	1546		1773		1770	0	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	11	2560	0	0	2871	16	76	1	1	11	0	40
RTOR Reduction (vph)	0	0	0	0	0	4	0	0	0	0	40	0
Lane Group Flow (vph)	11	2560	0	0	2871	12	0	78	0	11	0	0
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)						4						1
Turn Type	Prot	NA			NA	Perm	Perm	NA		Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Actuated Green, G (s)	6.2	155.1			145.5	145.5		11.0		4.3	0.0	
Effective Green, g (s)	6.2	155.1			145.5	145.5		11.0		4.3	0.0	
Actuated g/C Ratio	0.03	0.77			0.72	0.72		0.05		0.02	0.00	
Clearance Time (s)		6.8			6.8	6.8		6.8		6.8		
Vehicle Extension (s)		1.0			1.0	1.0		0.2		3.0		
Lane Grp Cap (vph)	54	3923			3680	1119		97		37	0	
v/s Ratio Prot	c0.01	c0.50			c0.56					c0.01		
v/s Ratio Perm						0.01		0.04				
v/c Ratio	0.20	0.65			0.78	0.01		0.80		0.30	0.00	
Uniform Delay, d1	95.0	10.6			17.6	7.7		93.9		96.9	100.5	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.9			1.7	0.0		34.9		4.5	0.0	
Delay (s)	96.4	11.4			19.3	7.7		128.9		101.3	100.5	
Level of Service	F	B			B	A		F		F	F	
Approach Delay (s)		11.8			19.2			128.9			100.7	
Approach LOS		B			B			F			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		18.1			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		201.0			Sum of lost time (s)			34.0				
Intersection Capacity Utilization		Err%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Future with Project (Weekday) PM

10/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	10	2278	0	0	2555	14	68	1	1	10	0	36
Future Volume (vph)	10	2278	0	0	2555	14	68	1	1	10	0	36
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)						4						1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	2560	0	0	2871	16	0	78	0	11	40	0
Turn Type	Prot	NA			NA	Perm	Perm	NA		Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Detector Phase	1	6			2	2	7	7		8		
Switch Phase												
Minimum Initial (s)		18.0			18.0	18.0	1.0	1.0		5.0		
Minimum Split (s)		24.8			24.8	24.8	14.0	14.0		20.8		
Total Split (s)		135.0			111.0	111.0	21.0	21.0		21.0		
Total Split (%)		67.2%			55.2%	55.2%	10.4%	10.4%		10.4%		
Yellow Time (s)		4.8			4.8	4.8	4.8	4.8		4.8		
All-Red Time (s)		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		
Total Lost Time (s)		6.8			6.8	6.8		6.8		6.8		
Lead/Lag					Lag	Lag	Lag	Lag				
Lead-Lag Optimize?					Yes	Yes	Yes	Yes				
Recall Mode		C-Max			C-Max	C-Max	None	None		None		
v/c Ratio	0.12	0.61			0.71	0.01		0.80		0.16	0.24	
Control Delay	75.2	10.6			16.4	0.0		142.7		96.4	0.0	
Queue Delay	0.0	0.0			3.8	0.0		0.0		0.0	0.0	
Total Delay	75.2	10.6			20.2	0.0		142.7		96.4	0.0	
Queue Length 50th (ft)	14	250			320	0		104		15	0	
Queue Length 95th (ft)	26	895			1366	0		167		38	0	
Internal Link Dist (ft)		886			389			350			366	
Turn Bay Length (ft)	150					100						
Base Capacity (vph)	181	4164			4024	1249		125		125	168	
Starvation Cap Reductn	0	0			1053	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	0.06	0.61			0.97	0.01		0.62		0.09	0.24	

Intersection Summary

Cycle Length: 201

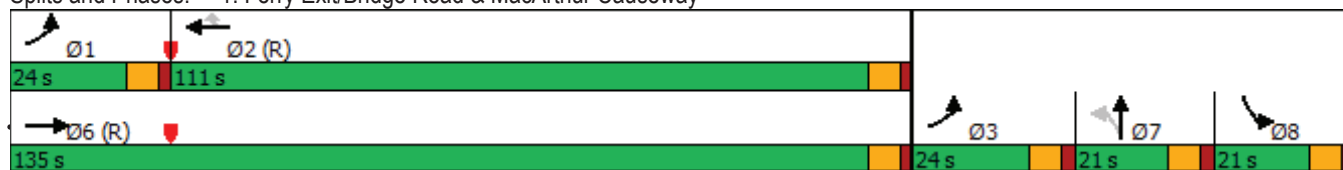
Actuated Cycle Length: 201

Offset: 9 (4%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 1: Ferry Exit/Bridge Road & MacArthur Causeway



DPA

Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Future with Project (Weekday) PM

10/06/2021

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	7.0	1.0
Minimum Split (s)	13.8	23.8
Total Split (s)	24.0	24.0
Total Split (%)	12%	12%
Yellow Time (s)	4.8	4.8
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

# HCM Signalized Intersection Capacity Analysis

Future with Project (Weekday) AM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021

	→	↗	↘	↖	←	↙	↘	↖	↗
Movement	EBT	EBR	EBR2	WBL2	WBL	NBL	NWL2	NWL	NWR
Lane Configurations	↑↑↑	↗			↘	↙		↖	
Traffic Volume (vph)	2789	295	95	98	30	0	10	55	1
Future Volume (vph)	2789	295	95	98	30	0	10	55	1
Ideal Flow (vphpl)	1950	1900	1950	1950	1900	1950	1900	1900	1900
Lane Width	12	12	12	8	12	12	12	12	12
Total Lost time (s)	7.3	7.3			6.8			6.0	
Lane Util. Factor	0.91	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.97			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00	
Frt	1.00	0.85			1.00			1.00	
Flt Protected	1.00	1.00			0.95			0.95	
Satd. Flow (prot)	5119	1505			1597			1600	
Flt Permitted	1.00	1.00			0.95			0.95	
Satd. Flow (perm)	5119	1505			1597			1600	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	2905	307	99	102	31	0	10	57	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	61	0
Lane Group Flow (vph)	2905	406	0	0	133	0	0	7	0
Confl. Peds. (#/hr)				9	9			9	5
Confl. Bikes (#/hr)		7	7						
Heavy Vehicles (%)	4%	5%	2%	17%	0%	0%	2%	15%	2%
Turn Type	NA	Perm		Prot	Prot	Prot	Prot	Prot	
Protected Phases	6			5	5	8	3 7	3 7	
Permitted Phases		6							
Actuated Green, G (s)	107.9	107.9			24.4			17.6	
Effective Green, g (s)	107.9	107.9			24.4			17.6	
Actuated g/C Ratio	0.63	0.63			0.14			0.10	
Clearance Time (s)	7.3	7.3			6.8				
Vehicle Extension (s)	1.0	1.0			2.0				
Lane Grp Cap (vph)	3249	955			229			165	
v/s Ratio Prot	c0.57				c0.08			c0.00	
v/s Ratio Perm		0.27							
v/c Ratio	0.89	0.43			0.58			0.04	
Uniform Delay, d1	26.2	15.5			68.0			68.6	
Progression Factor	1.00	1.00			1.00			1.00	
Incremental Delay, d2	4.3	1.4			2.4			0.1	
Delay (s)	30.5	16.9			70.4			68.7	
Level of Service	C	B			E			E	
Approach Delay (s)	28.9					0.0		68.7	
Approach LOS	C					A		E	
<b>Intersection Summary</b>									
HCM 2000 Control Delay			31.2		HCM 2000 Level of Service			C	
HCM 2000 Volume to Capacity ratio			0.81						
Actuated Cycle Length (s)			170.0		Sum of lost time (s)			32.1	
Intersection Capacity Utilization			80.1%		ICU Level of Service			D	
Analysis Period (min)			15						










c Critical Lane Group

# Timings

Future with Project (Weekday) AM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021

												
Lane Group	EBT	EBR	EBR2	WBL2	WBL	NBL	NWL2	NWL	NWR	Ø2	Ø3	Ø7
Lane Configurations	↑↑↑	↔			↔	↔		↔				
Traffic Volume (vph)	2789	295	95	98	30	0	10	55	1			
Future Volume (vph)	2789	295	95	98	30	0	10	55	1			
Confl. Peds. (#/hr)				9	9			9	5			
Confl. Bikes (#/hr)		7	7									
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Heavy Vehicles (%)	4%	5%	2%	17%	0%	0%	2%	15%	2%			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2905	406	0	0	133	0	0	68	0			
Turn Type	NA	Perm		Prot	Prot	Prot	Prot	Prot				
Protected Phases	6			5	5	8	3 7	3 7		2	3	7
Permitted Phases		6										
Detector Phase	6	6		5	5	8	7	7				
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	5.0	10.0				20.0	1.0	7.0
Minimum Split (s)	27.3	27.3		12.3	12.3	16.0				27.3	29.0	13.0
Total Split (s)	77.0	77.0		19.0	19.0	32.0				141.0	29.0	13.0
Total Split (%)	45.3%	45.3%		11.2%	11.2%	18.8%				83%	17%	8%
Yellow Time (s)	4.8	4.8		4.8	4.8	4.0				4.8	4.0	4.0
All-Red Time (s)	2.5	2.5		2.0	2.0	2.0				2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0						
Total Lost Time (s)	7.3	7.3			6.8	6.0						
Lead/Lag	Lead	Lead		Lag	Lag	Lead						Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						Yes
Recall Mode	C-Max	C-Max		None	None	None				C-Max	None	None
v/c Ratio	0.86	0.41			0.58			0.31				
Control Delay	26.3	16.7			79.2			4.6				
Queue Delay	0.0	0.0			0.0			0.0				
Total Delay	26.3	16.7			79.2			4.6				
Queue Length 50th (ft)	755	171			142			0				
Queue Length 95th (ft)	#1392	397			218			6				
Internal Link Dist (ft)	231					430		189				
Turn Bay Length (ft)		175										
Base Capacity (vph)	3392	992			229			222				
Starvation Cap Reductn	0	0			0			0				
Spillback Cap Reductn	0	0			0			0				
Storage Cap Reductn	0	0			0			0				
Reduced v/c Ratio	0.86	0.41			0.58			0.31				
<b>Intersection Summary</b>												
Cycle Length: 170												
Actuated Cycle Length: 170												
Offset: 37 (22%), Referenced to phase 6:EBT and 2:, Start of Green												
Natural Cycle: 150												
Control Type: Actuated-Coordinated												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												



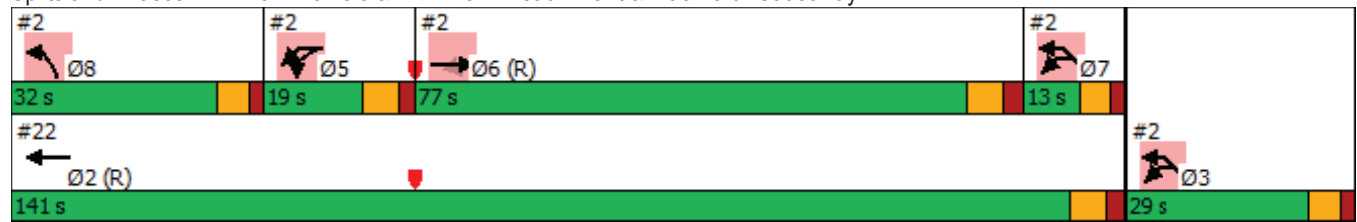
# Timings

Future with Project (Weekday) AM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021

Splits and Phases: 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway



# HCM Signalized Intersection Capacity Analysis

Future with Project (Weekday) PM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021

	→	↗	↘	↙	←	↖	↗	↖
Movement	EBT	EBR	EBR2	WBL2	WBL	NBL	NWL2	NWL
Lane Configurations	↑↑↑	↑			↓	↓		↓
Traffic Volume (vph)	2169	86	48	54	19	0	1	301
Future Volume (vph)	2169	86	48	54	19	0	1	301
Ideal Flow (vphpl)	1950	1900	1950	1950	1900	1950	1900	1900
Lane Width	12	12	12	8	12	12	12	12
Total Lost time (s)	7.3	7.3			6.8			6.0
Lane Util. Factor	0.91	1.00			1.00			1.00
Frpb, ped/bikes	1.00	0.98			1.00			1.00
Flpb, ped/bikes	1.00	1.00			1.00			1.00
Frt	1.00	0.85			1.00			1.00
Flt Protected	1.00	1.00			0.95			0.95
Satd. Flow (prot)	5219	1550			1703			1752
Flt Permitted	1.00	1.00			0.95			0.95
Satd. Flow (perm)	5219	1550			1703			1752
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	2384	95	53	59	21	0	1	331
RTOR Reduction (vph)	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	2384	148	0	0	80	0	0	332
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)		1	1					
Heavy Vehicles (%)	2%	2%	2%	6%	6%	2%	2%	3%
Turn Type	NA	Perm		Prot	Prot	Prot	Prot	Prot
Protected Phases	6			5	5	8	3 7	3 7
Permitted Phases		6						
Actuated Green, G (s)	109.5	109.5			12.8			17.6
Effective Green, g (s)	109.5	109.5			12.8			17.6
Actuated g/C Ratio	0.68	0.68			0.08			0.11
Clearance Time (s)	7.3	7.3			6.8			
Vehicle Extension (s)	1.0	1.0			2.0			
Lane Grp Cap (vph)	3571	1060			136			192
v/s Ratio Prot	c0.46				c0.05			c0.19
v/s Ratio Perm		0.10						
v/c Ratio	0.67	0.14			0.59			1.73
Uniform Delay, d1	14.7	8.8			71.1			71.2
Progression Factor	1.00	1.00			1.00			1.00
Incremental Delay, d2	1.0	0.3			4.1			349.0
Delay (s)	15.7	9.1			75.2			420.2
Level of Service	B	A			E			F
Approach Delay (s)	15.3					0.0		420.2
Approach LOS	B					A		F
<b>Intersection Summary</b>								
HCM 2000 Control Delay			62.6		HCM 2000 Level of Service			E
HCM 2000 Volume to Capacity ratio			0.87					
Actuated Cycle Length (s)			160.0		Sum of lost time (s)			32.1
Intersection Capacity Utilization			89.5%		ICU Level of Service			E
Analysis Period (min)			15					
c Critical Lane Group								

# Timings

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

Future with Project (Weekday) PM

10/11/2021

	→	↖	↗	↘	↙	↕	↖	↗			
Lane Group	EBT	EBR	EBR2	WBL2	WBL	NBL	NWL2	NWL	Ø2	Ø3	Ø7
Lane Configurations	↑↑↑	↑			↓	↓		↓			
Traffic Volume (vph)	2169	86	48	54	19	0	1	301			
Future Volume (vph)	2169	86	48	54	19	0	1	301			
Confl. Peds. (#/hr)											
Confl. Bikes (#/hr)		1	1								
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Heavy Vehicles (%)	2%	2%	2%	6%	6%	2%	2%	3%			
Shared Lane Traffic (%)											
Lane Group Flow (vph)	2384	148	0	0	80	0	0	332			
Turn Type	NA	Perm		Prot	Prot	Prot	Prot	Prot			
Protected Phases	6			5	5	8	3 7	3 7	2	3	7
Permitted Phases		6									
Detector Phase	6	6		5	5	8	7	7			
Switch Phase											
Minimum Initial (s)	20.0	20.0		5.0	5.0	10.0			20.0	1.0	7.0
Minimum Split (s)	27.3	27.3		12.3	12.3	16.0			27.3	29.0	13.0
Total Split (s)	65.0	65.0		16.0	16.0	37.0			131.0	29.0	13.0
Total Split (%)	40.6%	40.6%		10.0%	10.0%	23.1%			82%	18%	8%
Yellow Time (s)	4.8	4.8		4.8	4.8	4.0			4.8	4.0	4.0
All-Red Time (s)	2.5	2.5		2.0	2.0	2.0			2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0					
Total Lost Time (s)	7.3	7.3			6.8	6.0					
Lead/Lag	Lead	Lead		Lag	Lag	Lead					Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes					Yes
Recall Mode	C-Max	C-Max		None	None	None			C-Max	None	None
v/c Ratio	0.64	0.13			0.59			2.37			
Control Delay	15.3	9.9			87.7			668.4			
Queue Delay	0.0	0.0			0.0			0.0			
Total Delay	15.3	9.9			87.7			668.4			
Queue Length 50th (ft)	383	39			82			~636			
Queue Length 95th (ft)	810	119			140			#498			
Internal Link Dist (ft)	231					430		189			
Turn Bay Length (ft)		175									
Base Capacity (vph)	3727	1105			138			140			
Starvation Cap Reductn	0	0			0			0			
Spillback Cap Reductn	0	0			0			0			
Storage Cap Reductn	0	0			0			0			
Reduced v/c Ratio	0.64	0.13			0.58			2.37			

### Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 158 (99%), Referenced to phase 6:EBT and 2:, Start of Green

Natural Cycle: 140

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.

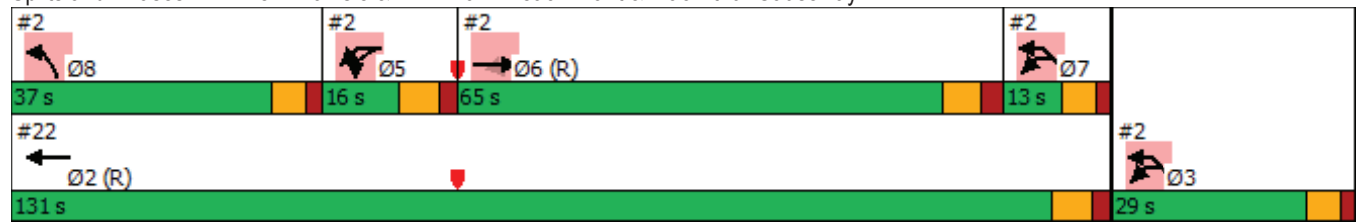
# Timings

Future with Project (Weekday) PM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021

Splits and Phases: 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway



# HCM Signalized Intersection Capacity Analysis with Project with Improvements (Weekday) PM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/12/2021

	→	↗	↘	↖	←	↙	↘	↖
Movement	EBT	EBR	EBR2	WBL2	WBL	NBL	NWL2	NWL
Lane Configurations	↑↑↑	↑			↔	↔		↔
Traffic Volume (vph)	2169	86	48	54	19	0	1	301
Future Volume (vph)	2169	86	48	54	19	0	1	301
Ideal Flow (vphpl)	1950	1900	1950	1950	1900	1950	1900	1900
Lane Width	12	12	12	8	12	12	12	12
Total Lost time (s)	7.3	7.3			6.8			6.0
Lane Util. Factor	0.91	1.00			1.00			1.00
Frpb, ped/bikes	1.00	0.98			1.00			1.00
Flpb, ped/bikes	1.00	1.00			1.00			1.00
Frt	1.00	0.85			1.00			1.00
Flt Protected	1.00	1.00			0.95			0.95
Satd. Flow (prot)	5219	1550			1703			1752
Flt Permitted	1.00	1.00			0.95			0.95
Satd. Flow (perm)	5219	1550			1703			1752
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	2384	95	53	59	21	0	1	331
RTOR Reduction (vph)	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	2384	148	0	0	80	0	0	332
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)		1	1					
Heavy Vehicles (%)	2%	2%	2%	6%	6%	2%	2%	3%
Turn Type	NA	Perm		Prot	Prot	Prot	Prot	Prot
Protected Phases	6			5	5	8	3 7	3 7
Permitted Phases		6						
Actuated Green, G (s)	94.5	94.5			12.8			32.6
Effective Green, g (s)	94.5	94.5			12.8			32.6
Actuated g/C Ratio	0.59	0.59			0.08			0.20
Clearance Time (s)	7.3	7.3			6.8			
Vehicle Extension (s)	1.0	1.0			2.0			
Lane Grp Cap (vph)	3082	915			136			356
v/s Ratio Prot	c0.46				c0.05			c0.19
v/s Ratio Perm		0.10						
v/c Ratio	0.77	0.16			0.59			0.93
Uniform Delay, d1	24.7	14.8			71.1			62.6
Progression Factor	1.00	1.00			1.00			1.00
Incremental Delay, d2	2.0	0.4			4.1			30.8
Delay (s)	26.6	15.2			75.2			93.4
Level of Service	C	B			E			F
Approach Delay (s)	26.0					0.0		93.4
Approach LOS	C					A		F
<b>Intersection Summary</b>								
HCM 2000 Control Delay			34.9		HCM 2000 Level of Service			C
HCM 2000 Volume to Capacity ratio			0.87					
Actuated Cycle Length (s)			160.0		Sum of lost time (s)			32.1
Intersection Capacity Utilization			89.5%		ICU Level of Service			E
Analysis Period (min)			15					

c Critical Lane Group

# Timings

# Future with Project with Improvements (Weekday) PM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/12/2021

	→	↖	↗	↘	↙	↕	↘	↙			
Lane Group	EBT	EBR	EBR2	WBL2	WBL	NBL	NWL2	NWL	Ø2	Ø3	Ø7
Lane Configurations	↑↑↑	↑			↓	↓		↓			
Traffic Volume (vph)	2169	86	48	54	19	0	1	301			
Future Volume (vph)	2169	86	48	54	19	0	1	301			
Confl. Peds. (#/hr)											
Confl. Bikes (#/hr)		1	1								
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Heavy Vehicles (%)	2%	2%	2%	6%	6%	2%	2%	3%			
Shared Lane Traffic (%)											
Lane Group Flow (vph)	2384	148	0	0	80	0	0	332			
Turn Type	NA	Perm		Prot	Prot	Prot	Prot	Prot			
Protected Phases	6			5	5	8	3 7	3 7	2	3	7
Permitted Phases		6									
Detector Phase	6	6		5	5	8	7	7			
Switch Phase											
Minimum Initial (s)	20.0	20.0		5.0	5.0	10.0			20.0	1.0	7.0
Minimum Split (s)	27.3	27.3		12.3	12.3	16.0			27.3	29.0	13.0
Total Split (s)	65.0	65.0		16.0	16.0	22.0			131.0	29.0	28.0
Total Split (%)	40.6%	40.6%		10.0%	10.0%	13.8%			82%	18%	18%
Yellow Time (s)	4.8	4.8		4.8	4.8	4.0			4.8	4.0	4.0
All-Red Time (s)	2.5	2.5		2.0	2.0	2.0			2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0					
Total Lost Time (s)	7.3	7.3			6.8	6.0					
Lead/Lag	Lead	Lead		Lag	Lag	Lead					Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes					Yes
Recall Mode	C-Max	C-Max		None	None	None			C-Max	None	None
v/c Ratio	0.74	0.15			0.59			1.09			
Control Delay	24.7	16.0			87.7			135.9			
Queue Delay	0.0	0.0			0.0			0.0			
Total Delay	24.7	16.0			87.7			135.9			
Queue Length 50th (ft)	550	56			82			~459			
Queue Length 95th (ft)	#1042	145			140			404			
Internal Link Dist (ft)	231					430		189			
Turn Bay Length (ft)		175									
Base Capacity (vph)	3238	960			138			304			
Starvation Cap Reductn	0	0			0			0			
Spillback Cap Reductn	0	0			0			0			
Storage Cap Reductn	0	0			0			0			
Reduced v/c Ratio	0.74	0.15			0.58			1.09			

### Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 158 (99%), Referenced to phase 6:EBT and 2:, Start of Green

Natural Cycle: 140

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.

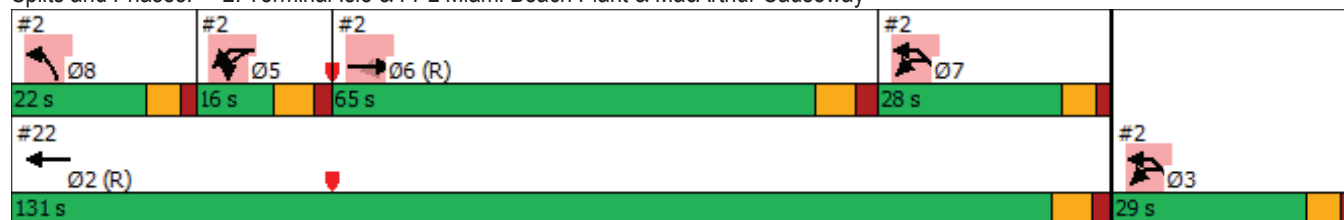
# Timings

Future with Project with Improvements (Weekday) PM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/12/2021

Splits and Phases: 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway
























# HCM Signalized Intersection Capacity Analysis

## 3: Alton Road & 5th Street

Future with Project (Weekday) AM

10/12/2021






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1136	488	30	739	82	228	149	23	80	156	665
Future Volume (vph)	16	1136	488	30	739	82	228	149	23	80	156	665
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.94	1.00	1.00	0.98	1.00	0.98			1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (prot)		3504	1455	1517	3539	1544	3433	1721			1832	1553
Flt Permitted		0.93	1.00	0.95	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (perm)		3264	1455	1517	3539	1544	3433	1721			1832	1553
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	18	1248	536	33	812	90	251	164	25	88	171	731
RTOR Reduction (vph)	0	0	144	0	0	36	0	3	0	0	0	0
Lane Group Flow (vph)	0	1266	392	33	812	54	251	186	0	0	259	731
Confl. Peds. (#/hr)	3		27	27		3			43	43		
Confl. Bikes (#/hr)			4			5			1			
Heavy Vehicles (%)	0%	3%	4%	19%	2%	3%	2%	7%	0%	0%	3%	4%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Actuated Green, G (s)		95.8	95.8	6.1	107.9	107.9	23.4	23.4			30.7	180.0
Effective Green, g (s)		95.8	95.8	6.1	107.9	107.9	23.4	23.4			30.7	180.0
Actuated g/C Ratio		0.53	0.53	0.03	0.60	0.60	0.13	0.13			0.17	1.00
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	1.0	3.0	3.0			3.5	
Lane Grp Cap (vph)		1737	774	51	2121	925	446	223			312	1553
v/s Ratio Prot				0.02	0.23		0.07	c0.11			c0.14	
v/s Ratio Perm		c0.39	0.27			0.03						c0.47
v/c Ratio		0.73	0.51	0.65	0.38	0.06	0.56	0.83			0.83	0.47
Uniform Delay, d1		32.2	27.0	85.9	18.7	15.0	73.5	76.4			72.1	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2		2.7	2.4	19.2	0.5	0.1	1.6	22.4			17.2	1.0
Delay (s)		34.9	29.3	105.1	19.3	15.1	75.1	98.8			89.3	1.0
Level of Service		C	C	F	B	B	E	F			F	A
Approach Delay (s)		33.2			21.9			85.3			24.1	
Approach LOS		C			C			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			34.0									
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			180.0									
Intersection Capacity Utilization			83.4%									
Analysis Period (min)			15									
c Critical Lane Group												



Timings  
3: Alton Road & 5th Street

Future with Project (Weekday) AM

10/12/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1136	488	30	739	82	228	149	23	80	156	665
Future Volume (vph)	16	1136	488	30	739	82	228	149	23	80	156	665
Confl. Peds. (#/hr)	3		27	27		3			43	43		
Confl. Bikes (#/hr)			4			5			1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	3%	4%	19%	2%	3%	2%	7%	0%	0%	3%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1266	536	33	812	90	251	189	0	0	259	731
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Detector Phase	2	2	2	1	6	6	3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	35.0	35.0	35.0	11.0	13.0	13.0	23.0	23.0		31.0	31.0	
Total Split (s)	92.0	92.0	92.0	11.0	103.0	103.0	33.0	33.0		44.0	44.0	
Total Split (%)	51.1%	51.1%	51.1%	6.1%	57.2%	57.2%	18.3%	18.3%		24.4%	24.4%	
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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
v/c Ratio		0.72	0.58	0.54	0.38	0.09	0.56	0.84			0.83	0.47
Control Delay		36.6	15.0	112.0	20.5	3.5	78.1	103.2			93.6	1.0
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay		36.6	15.0	112.0	20.5	3.5	78.1	103.2			93.6	1.0
Queue Length 50th (ft)		628	188	39	261	0	144	215			299	0
Queue Length 95th (ft)		764	332	#115	350	30	192	309			393	0
Internal Link Dist (ft)		300			275			278			324	
Turn Bay Length (ft)			225	125								
Base Capacity (vph)		1759	926	61	2122	961	514	261			386	1553
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		0.72	0.58	0.54	0.38	0.09	0.49	0.72			0.67	0.47

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 37 (21%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

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

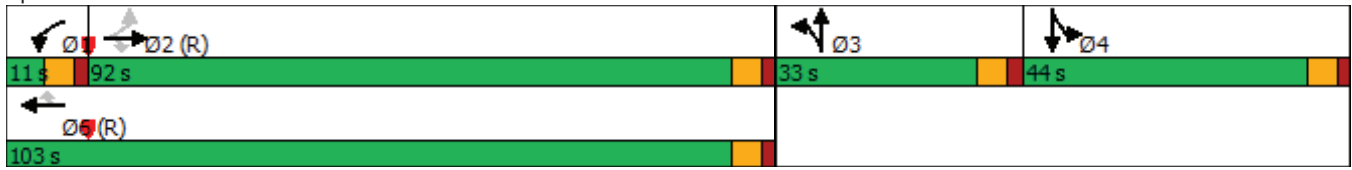
Queue shown is maximum after two cycles.

Timings  
3: Alton Road & 5th Street

Future with Project (Weekday) AM

10/12/2021

Splits and Phases: 3: Alton Road & 5th Street















# HCM Signalized Intersection Capacity Analysis

## 3: Alton Road & 5th Street

Future with Project (Weekday) PM













10/12/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑↑	↑
Traffic Volume (vph)	12	678	401	19	1041	135	384	185	25	75	230	706
Future Volume (vph)	12	678	401	19	1041	135	384	185	25	75	230	706
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.94	1.00	1.00	0.99	1.00	0.98			1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (prot)		3494	1484	1480	3539	1563	3433	1797			1840	1559
Flt Permitted		0.92	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (perm)		3224	1484	1480	3539	1563	3433	1797			1840	1559
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)	13	737	436	21	1132	147	417	201	27	82	250	767
RTOR Reduction (vph)	0	0	225	0	0	66	0	3	0	0	0	0
Lane Group Flow (vph)	0	750	211	21	1132	81	417	225	0	0	332	767
Confl. Peds. (#/hr)	1		34	34		1	2		51	51		2
Confl. Bikes (#/hr)			6			1			10			13
Heavy Vehicles (%)	73%	2%	2%	22%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Actuated Green, G (s)		67.7	67.7	3.0	76.7	76.7	18.0	18.0			27.3	140.0
Effective Green, g (s)		67.7	67.7	3.0	76.7	76.7	18.0	18.0			27.3	140.0
Actuated g/C Ratio		0.48	0.48	0.02	0.55	0.55	0.13	0.13			0.20	1.00
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	1.0	3.0	3.0			3.5	
Lane Grp Cap (vph)		1559	717	31	1938	856	441	231			358	1559
v/s Ratio Prot				0.01	c0.32		0.12	c0.12			c0.18	
v/s Ratio Perm		0.23	0.14			0.05						c0.49
v/c Ratio		0.48	0.29	0.68	0.58	0.09	0.95	0.97			0.93	0.49
Uniform Delay, d1		24.3	21.8	68.0	21.0	15.1	60.5	60.7			55.4	0.0
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	1.0	37.4	1.3	0.2	29.2	51.0			29.8	1.1
Delay (s)		25.4	22.8	105.4	22.3	15.3	89.7	111.7			85.2	1.1
Level of Service		C	C	F	C	B	F	F			F	A
Approach Delay (s)		24.4			22.9			97.5			26.5	
Approach LOS		C			C			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			35.6									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			140.0									Sum of lost time (s) 24.0
Intersection Capacity Utilization			88.1%									ICU Level of Service E
Analysis Period (min)			15									
c Critical Lane Group												

Timings  
3: Alton Road & 5th Street

Future with Project (Weekday) PM

10/12/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑	↗	↖↗	↖			↗↑	↗
Traffic Volume (vph)	12	678	401	19	1041	135	384	185	25	75	230	706
Future Volume (vph)	12	678	401	19	1041	135	384	185	25	75	230	706
Confl. Peds. (#/hr)	1		34	34		1	2		51	51		2
Confl. Bikes (#/hr)			6			1			10			13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	73%	2%	2%	22%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	750	436	21	1132	147	417	228	0	0	332	767
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Detector Phase	2	2	2	1	6	6	3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	35.0	35.0	35.0	11.0	13.0	13.0	23.0	23.0		31.0	31.0	
Total Split (s)	71.0	71.0	71.0	11.0	82.0	82.0	24.0	24.0		34.0	34.0	
Total Split (%)	50.7%	50.7%	50.7%	7.9%	58.6%	58.6%	17.1%	17.1%		24.3%	24.3%	
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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
v/c Ratio		0.46	0.45	0.40	0.58	0.16	0.95	0.97			0.93	0.49
Control Delay		24.8	3.5	88.4	22.7	2.7	91.3	111.6			87.4	1.1
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay		24.8	3.5	88.4	22.7	2.7	91.3	111.6			87.4	1.1
Queue Length 50th (ft)		246	0	19	352	0	196	206			298	0
Queue Length 95th (ft)		305	59	#49	421	32	#299	#380			#476	0
Internal Link Dist (ft)		300			275			278			324	
Turn Bay Length (ft)			225	125								
Base Capacity (vph)		1615	960	52	1940	923	441	234			368	1559
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	0.45	0.40	0.58	0.16	0.95	0.97			0.90	0.49

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 57 (41%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

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

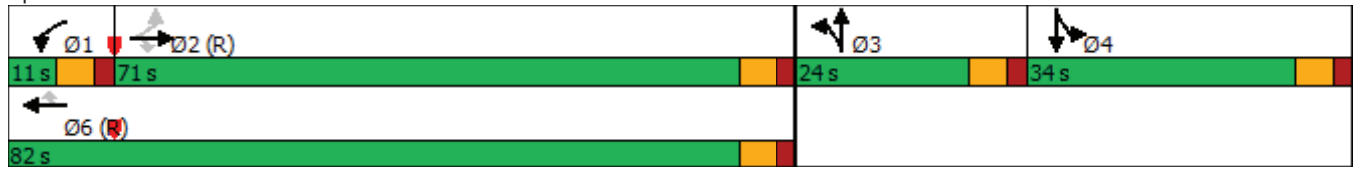
Queue shown is maximum after two cycles.




Timings  
3: Alton Road & 5th Street

Future with Project (Weekday) PM

10/12/2021

Splits and Phases: 3: Alton Road & 5th Street






Intersection						
Int Delay, s/veh	1.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	29	195	0	62	41	0
Future Vol, veh/h	29	195	0	62	41	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	203	0	65	43	0
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	233	0	197	132
Stage 1	-	-	-	-	132	-
Stage 2	-	-	-	-	65	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1335	-	792	917
Stage 1	-	-	-	-	894	-
Stage 2	-	-	-	-	958	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1335	-	792	917
Mov Cap-2 Maneuver	-	-	-	-	792	-
Stage 1	-	-	-	-	894	-
Stage 2	-	-	-	-	958	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		9.8	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	792	-	-	1335	-	
HCM Lane V/C Ratio	0.054	-	-	-	-	
HCM Control Delay (s)	9.8	-	-	0	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

HCM 6th TWSC  
4: Project Driveway & Terminal Isle

Future with Project (Weekday) PM

10/06/2021

Intersection						
Int Delay, s/veh	5.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	144	105	0	38	238	0
Future Vol, veh/h	144	105	0	38	238	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	157	114	0	41	259	0
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	271	0	255	214
Stage 1	-	-	-	-	214	-
Stage 2	-	-	-	-	41	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1292	-	734	826
Stage 1	-	-	-	-	822	-
Stage 2	-	-	-	-	981	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1292	-	734	826
Mov Cap-2 Maneuver	-	-	-	-	734	-
Stage 1	-	-	-	-	822	-
Stage 2	-	-	-	-	981	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		12.6	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	734	-	-	1292	-	
HCM Lane V/C Ratio	0.352	-	-	-	-	
HCM Control Delay (s)	12.6	-	-	0	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	1.6	-	-	0	-	

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑			↑		↗
Traffic Vol, veh/h	2781	0	0	1981	0	33
Future Vol, veh/h	2781	0	0	1981	0	33
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	4	0	0	3	0	17
Mvmt Flow	2897	0	0	2064	0	34
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	-	-	-	-	1449
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	4.0615
Pot Cap-1 Maneuver	-	0	0	-	0	137
Stage 1	-	0	0	-	0	-
Stage 2	-	0	0	-	0	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	-	137
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		39.9		
HCM LOS	E					
Minor Lane/Major Mvmt	NBLn1	EBT	WBT			
Capacity (veh/h)	137	-	-			
HCM Lane V/C Ratio	0.251	-	-			
HCM Control Delay (s)	39.9	-	-			
HCM Lane LOS	E	-	-			
HCM 95th %tile Q(veh)	0.9	-	-			



**Intersection**

Int Delay, s/veh 2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑		↗
Traffic Vol, veh/h	2167	0	0	73	0	105
Future Vol, veh/h	2167	0	0	73	0	105
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2355	0	0	79	0	114

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	-	- 1179
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	- 6.4
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	- 3.919
Pot Cap-1 Maneuver	-	0	0 - 201
Stage 1	-	0	0 -
Stage 2	-	0	0 -
Platoon blocked, %	-		-
Mov Cap-1 Maneuver	-	-	- 201
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	44.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	201	-	-
HCM Lane V/C Ratio	0.568	-	-
HCM Control Delay (s)	44.1	-	-
HCM Lane LOS	E	-	-
HCM 95th %tile Q(veh)	3.1	-	-
























## **Weekend Existing Conditions**

# HCM Signalized Intersection Capacity Analysis

## 1: Ferry Exit/Bridge Road & MacArthur Causeway

Existing (Weekend) AM
























10/06/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	16	2708	0	0	1944	8	0	0	0	7	0	6
Future Volume (vph)	16	2708	0	0	1944	8	0	0	0	7	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8			6.8	6.8				6.8	4.0	
Lane Util. Factor	1.00	0.91			0.91	1.00				1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00	0.97				1.00	0.90	
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00	1.00	
Frt	1.00	1.00			1.00	0.85				1.00	0.86	
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1597	5085			5085	1541				1583	0	
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (perm)	1597	5085			5085	1541				1583	0	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	17	2881	0	0	2068	9	0	0	0	7	0	6
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	0	0	6	0
Lane Group Flow (vph)	17	2881	0	0	2068	7	0	0	0	7	0	0
Confl. Peds. (#/hr)			4	4						1		
Confl. Bikes (#/hr)			13			14						2
Heavy Vehicles (%)	13%	2%	2%	2%	2%	2%	2%	2%	2%	14%	2%	2%
Turn Type	Prot	NA			NA	Perm				Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Actuated Green, G (s)	7.8	162.0			150.8	150.8				4.2	0.0	
Effective Green, g (s)	7.8	162.0			150.8	150.8				4.2	0.0	
Actuated g/C Ratio	0.04	0.85			0.79	0.79				0.02	0.00	
Clearance Time (s)		6.8			6.8	6.8				6.8		
Vehicle Extension (s)		1.0			1.0	1.0				3.0		
Lane Grp Cap (vph)	65	4335			4035	1223				34	0	
v/s Ratio Prot	c0.01	c0.57			0.41					c0.00		
v/s Ratio Perm						0.00						
v/c Ratio	0.26	0.66			0.51	0.01				0.21	0.00	
Uniform Delay, d1	88.3	4.8			6.8	4.1				91.3	95.0	
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	
Incremental Delay, d2	1.6	0.8			0.5	0.0				3.0	0.0	
Delay (s)	89.9	5.6			7.3	4.1				94.3	95.0	
Level of Service	F	A			A	A				F	F	
Approach Delay (s)		6.1			7.3			0.0			94.6	
Approach LOS		A			A			A			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		6.8			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		190.0			Sum of lost time (s)			34.0				
Intersection Capacity Utilization		Err%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Existing (Weekend) AM

10/08/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	16	2708	0	0	1944	8	0	0	0	7	0	6
Future Volume (vph)	16	2708	0	0	1944	8	0	0	0	7	0	6
Confl. Peds. (#/hr)			4	4						1		
Confl. Bikes (#/hr)			13			14						2
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	13%	2%	2%	2%	2%	2%	2%	2%	2%	14%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	2881	0	0	2068	9	0	0	0	7	6	0
Turn Type	Prot	NA			NA	Perm				Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Detector Phase	1	6			2	2	7	7		8		
Switch Phase												
Minimum Initial (s)		18.0			18.0	18.0	1.0	1.0		5.0		
Minimum Split (s)		24.8			24.8	24.8	14.0	14.0		20.8		
Total Split (s)		124.0			100.0	100.0	21.0	21.0		21.0		
Total Split (%)		65.3%			52.6%	52.6%	11.1%	11.1%		11.1%		
Yellow Time (s)		4.8			4.8	4.8	4.8	4.8		4.8		
All-Red Time (s)		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		
Total Lost Time (s)		6.8			6.8	6.8		6.8		6.8		
Lead/Lag					Lag	Lag	Lag	Lag				
Lead-Lag Optimize?					Yes	Yes	Yes	Yes				
Recall Mode		C-Max			C-Max	C-Max	None	None		None		
v/c Ratio	0.19	0.61			0.47	0.01				0.11	0.03	
Control Delay	78.1	5.3			6.6	0.0				89.3	0.0	
Queue Delay	0.0	0.0			0.3	0.0				0.0	0.0	
Total Delay	78.1	5.3			6.9	0.0				89.3	0.0	
Queue Length 50th (ft)	21	0			130	0				9	0	
Queue Length 95th (ft)	40	804			563	0				28	0	
Internal Link Dist (ft)		886			389			350			366	
Turn Bay Length (ft)	150					100						
Base Capacity (vph)	173	4699			4436	1356				118	178	
Starvation Cap Reductn	0	0			1514	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	0.10	0.61			0.71	0.01				0.06	0.03	

Intersection Summary

Cycle Length: 190

Actuated Cycle Length: 190

Offset: 96 (51%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 1: Ferry Exit/Bridge Road & MacArthur Causeway



Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Existing (Weekend) AM

10/08/2021



















Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	7.0	1.0
Minimum Split (s)	13.8	23.8
Total Split (s)	24.0	24.0
Total Split (%)	13%	13%
Yellow Time (s)	4.8	4.8
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

# HCM Signalized Intersection Capacity Analysis

## 1: Ferry Exit/Bridge Road & MacArthur Causeway

Existing (Weekend) PM
























10/06/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	2954	0	0	2865	14	0	0	0	4	0	22
Future Volume (vph)	19	2954	0	0	2865	14	0	0	0	4	0	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8			6.8	6.8				6.8	4.0	
Lane Util. Factor	1.00	0.91			0.91	1.00				1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00	0.97				1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00	1.00	
Frt	1.00	1.00			1.00	0.85				1.00	0.86	
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1626	5085			5085	1541				1770	0	
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (perm)	1626	5085			5085	1541				1770	0	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	20	3143	0	0	3048	15	0	0	0	4	0	23
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	0	0	23	0
Lane Group Flow (vph)	20	3143	0	0	3048	13	0	0	0	4	0	0
Confl. Peds. (#/hr)	6		1	1		6						
Confl. Bikes (#/hr)			5			7						
Heavy Vehicles (%)	11%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	5%
Turn Type	Prot	NA			NA	Perm				Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Actuated Green, G (s)	5.2	175.0			163.0	163.0				1.4	0.0	
Effective Green, g (s)	5.2	175.0			163.0	163.0				1.4	0.0	
Actuated g/C Ratio	0.03	0.92			0.86	0.86				0.01	0.00	
Clearance Time (s)		6.8			6.8	6.8				6.8		
Vehicle Extension (s)		1.0			1.0	1.0				3.0		
Lane Grp Cap (vph)	44	4683			4362	1322				13	0	
v/s Ratio Prot	0.01	c0.62			c0.60					c0.00		
v/s Ratio Perm						0.01						
v/c Ratio	0.45	0.67			0.70	0.01				0.31	0.00	
Uniform Delay, d1	91.0	1.6			4.8	1.9				93.8	95.0	
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	
Incremental Delay, d2	5.3	0.8			1.0	0.0				13.0	0.0	
Delay (s)	96.3	2.3			5.7	1.9				106.8	95.0	
Level of Service	F	A			A	A				F	F	
Approach Delay (s)		2.9			5.7			0.0			96.8	
Approach LOS		A			A			A			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			4.7				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			190.0				Sum of lost time (s)			34.0		
Intersection Capacity Utilization			Err%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Existing (Weekend) PM

10/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	19	2954	0	0	2865	14	0	0	0	4	0	22
Future Volume (vph)	19	2954	0	0	2865	14	0	0	0	4	0	22
Confl. Peds. (#/hr)	6		1	1		6						
Confl. Bikes (#/hr)			5			7						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	11%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	3143	0	0	3048	15	0	0	0	4	23	0
Turn Type	Prot	NA			NA	Perm				Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Detector Phase	1	6			2	2	7	7		8		
Switch Phase												
Minimum Initial (s)		18.0			18.0	18.0	1.0	1.0		5.0		
Minimum Split (s)		24.8			24.8	24.8	14.0	14.0		20.8		
Total Split (s)		124.0			100.0	100.0	21.0	21.0		21.0		
Total Split (%)		65.3%			52.6%	52.6%	11.1%	11.1%		11.1%		
Yellow Time (s)		4.8			4.8	4.8	4.8	4.8		4.8		
All-Red Time (s)		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		
Total Lost Time (s)		6.8			6.8	6.8		6.8		6.8		
Lead/Lag					Lag	Lag	Lag	Lag				
Lead-Lag Optimize?					Yes	Yes	Yes	Yes				
Recall Mode		C-Max			C-Max	C-Max	None	None		None		
v/c Ratio	0.29	0.63			0.65	0.01				0.07	0.13	
Control Delay	98.9	1.4			4.4	0.0				91.5	0.0	
Queue Delay	0.0	0.0			0.7	0.0				0.0	0.0	
Total Delay	98.9	1.4			5.1	0.0				91.5	0.0	
Queue Length 50th (ft)	25	0			289	0				5	0	
Queue Length 95th (ft)	58	319			638	0				20	0	
Internal Link Dist (ft)		886			389			350			366	
Turn Bay Length (ft)	150					100						
Base Capacity (vph)	147	4975			4654	1415				132	178	
Starvation Cap Reductn	0	0			1088	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	0.63			0.85	0.01				0.03	0.13	

Intersection Summary

Cycle Length: 190

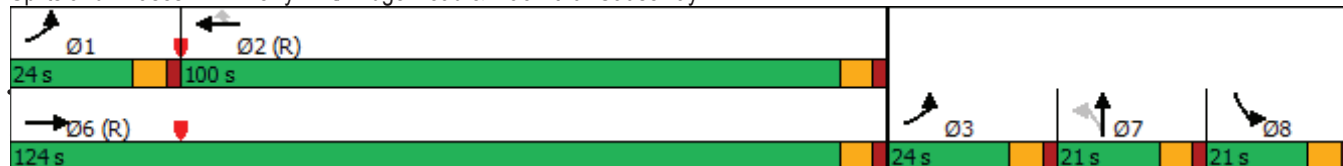
Actuated Cycle Length: 190

Offset: 96 (51%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 1: Ferry Exit/Bridge Road & MacArthur Causeway



Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Existing (Weekend) PM

10/06/2021

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	7.0	1.0
Minimum Split (s)	13.8	23.8
Total Split (s)	24.0	24.0
Total Split (%)	13%	13%
Yellow Time (s)	4.8	4.8
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		



# HCM Signalized Intersection Capacity Analysis

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

Existing (Weekend) AM

10/11/2021



Movement	EBT	EBR	WBL2	WBL	NBL	NWL	NWR
Lane Configurations	↑↑↑	↑		↓	↓	↓	
Traffic Volume (vph)	2669	54	37	0	0	40	1
Future Volume (vph)	2669	54	37	0	0	40	1
Ideal Flow (vphpl)	1950	1900	1950	1900	1950	1900	1900
Lane Width	12	12	8	12	12	12	12
Total Lost time (s)	7.3	7.3		6.8		6.0	
Lane Util. Factor	0.91	1.00		1.00		1.00	
Frpb, ped/bikes	1.00	0.97		1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00		1.00	
Frt	1.00	0.85		1.00		1.00	
Flt Protected	1.00	1.00		0.95		0.95	
Satd. Flow (prot)	5219	1483		1626		1720	
Flt Permitted	1.00	1.00		0.95		0.95	
Satd. Flow (perm)	5219	1483		1626		1720	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2809	57	39	0	0	42	1
RTOR Reduction (vph)	0	0	0	0	0	41	0
Lane Group Flow (vph)	2809	57	0	39	0	2	0
Confl. Peds. (#/hr)		2	2	2			
Confl. Bikes (#/hr)		11					1
Heavy Vehicles (%)	2%	6%	11%	2%	2%	5%	2%
Turn Type	NA	Perm	Prot	Prot	Prot	Prot	
Protected Phases	6		5	5	8	3	7
Permitted Phases		6					
Actuated Green, G (s)	117.2	117.2		7.1		5.6	
Effective Green, g (s)	117.2	117.2		7.1		5.6	
Actuated g/C Ratio	0.78	0.78		0.05		0.04	
Clearance Time (s)	7.3	7.3		6.8			
Vehicle Extension (s)	1.0	1.0		2.0			
Lane Grp Cap (vph)	4077	1158		76		64	
v/s Ratio Prot	c0.54			c0.02		c0.00	
v/s Ratio Perm		0.04					
v/c Ratio	0.69	0.05		0.51		0.03	
Uniform Delay, d1	7.8	3.7		69.8		69.6	
Progression Factor	1.00	1.00		1.00		1.00	
Incremental Delay, d2	1.0	0.1		2.4		0.2	
Delay (s)	8.7	3.8		72.2		69.7	
Level of Service	A	A		E		E	
Approach Delay (s)	8.6				0.0	69.7	
Approach LOS	A				A	E	
<b>Intersection Summary</b>							
HCM 2000 Control Delay			10.4		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.72				
Actuated Cycle Length (s)			150.0		Sum of lost time (s)		32.1
Intersection Capacity Utilization			64.7%		ICU Level of Service		C
Analysis Period (min)			15				

c Critical Lane Group

# Timings

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

Existing (Weekend) AM

10/11/2021



Lane Group	EBT	EBR	WBL2	WBL	NBL	NWL	NWR	Ø2	Ø3	Ø7
Lane Configurations	↑↑↑	↑		↓	↓	↓				
Traffic Volume (vph)	2669	54	37	0	0	40	1			
Future Volume (vph)	2669	54	37	0	0	40	1			
Confl. Peds. (#/hr)		2	2	2						
Confl. Bikes (#/hr)		11					1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Heavy Vehicles (%)	2%	6%	11%	2%	2%	5%	2%			
Shared Lane Traffic (%)										
Lane Group Flow (vph)	2809	57	0	39	0	43	0			
Turn Type	NA	Perm	Prot	Prot	Prot	Prot				
Protected Phases	6		5	5	8	3 7		2	3	7
Permitted Phases		6								
Detector Phase	6	6	5	5	8	7				
Switch Phase										
Minimum Initial (s)	20.0	20.0	5.0	5.0	10.0			20.0	1.0	7.0
Minimum Split (s)	27.3	27.3	12.3	12.3	16.0			27.3	29.0	13.0
Total Split (s)	57.0	57.0	19.0	19.0	32.0			121.0	29.0	13.0
Total Split (%)	38.0%	38.0%	12.7%	12.7%	21.3%			81%	19%	9%
Yellow Time (s)	4.8	4.8	4.8	4.8	4.0			4.8	4.0	4.0
All-Red Time (s)	2.5	2.5	2.0	2.0	2.0			2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0					
Total Lost Time (s)	7.3	7.3		6.8	6.0					
Lead/Lag	Lead	Lead	Lag	Lag	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	C-Max	C-Max	None	None	None			C-Max	None	None
v/c Ratio	0.67	0.05		0.45		0.22				
Control Delay	9.0	4.6		83.6		2.5				
Queue Delay	0.0	0.0		0.0		0.0				
Total Delay	9.0	4.6		83.6		2.5				
Queue Length 50th (ft)	451	12		38		0				
Queue Length 95th (ft)	548	26		77		0				
Internal Link Dist (ft)	231				430	189				
Turn Bay Length (ft)		175								
Base Capacity (vph)	4216	1187		132		198				
Starvation Cap Reductn	0	0		0		0				
Spillback Cap Reductn	0	0		0		0				
Storage Cap Reductn	0	0		0		0				
Reduced v/c Ratio	0.67	0.05		0.30		0.22				

### Intersection Summary

Cycle Length: 150

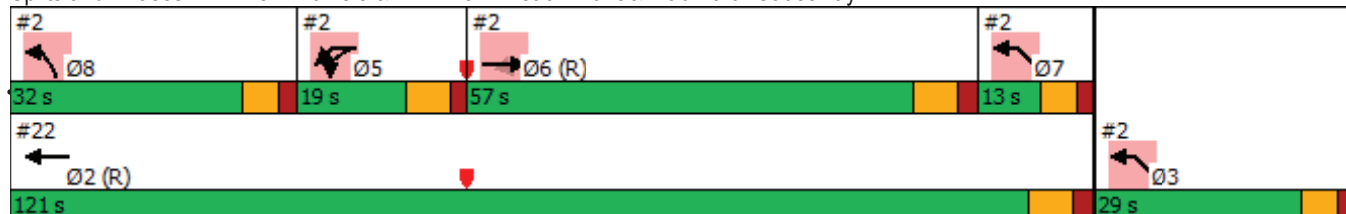
Actuated Cycle Length: 150

Offset: 81 (54%), Referenced to phase 6:EBT and 2:, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway



# HCM Signalized Intersection Capacity Analysis

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

Existing (Weekend) PM

10/11/2021



Movement	EBT	EBR	WBL2	WBL	NBL	NWL	NWR
Lane Configurations	↑↑↑	↑		↓	↓	↓	
Traffic Volume (vph)	2907	54	32	0	0	86	1
Future Volume (vph)	2907	54	32	0	0	86	1
Ideal Flow (vphpl)	1950	1900	1950	1900	1950	1900	1900
Lane Width	12	12	8	12	12	12	12
Total Lost time (s)	7.3	7.3		6.8		6.0	
Lane Util. Factor	0.91	1.00		1.00		1.00	
Frpb, ped/bikes	1.00	0.98		1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00		1.00	
Frt	1.00	0.85		1.00		1.00	
Flt Protected	1.00	1.00		0.95		0.95	
Satd. Flow (prot)	5219	1547		1752		1772	
Flt Permitted	1.00	1.00		0.95		0.95	
Satd. Flow (perm)	5219	1547		1752		1772	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3060	57	34	0	0	91	1
RTOR Reduction (vph)	0	0	0	0	0	88	0
Lane Group Flow (vph)	3060	57	0	34	0	4	0
Confl. Peds. (#/hr)		2	2	2			
Confl. Bikes (#/hr)		4					
Heavy Vehicles (%)	2%	2%	3%	2%	2%	2%	2%
Turn Type	NA	Perm	Prot	Prot	Prot	Prot	
Protected Phases	6		5	5	8	3	7
Permitted Phases		6					
Actuated Green, G (s)	116.4	116.4		6.5		7.0	
Effective Green, g (s)	116.4	116.4		6.5		7.0	
Actuated g/C Ratio	0.78	0.78		0.04		0.05	
Clearance Time (s)	7.3	7.3		6.8			
Vehicle Extension (s)	1.0	1.0		2.0			
Lane Grp Cap (vph)	4049	1200		75		82	
v/s Ratio Prot	c0.59			c0.02		c0.00	
v/s Ratio Perm		0.04					
v/c Ratio	0.76	0.05		0.45		0.05	
Uniform Delay, d1	9.1	3.9		70.0		68.3	
Progression Factor	1.00	1.00		1.00		1.00	
Incremental Delay, d2	1.4	0.1		1.6		0.3	
Delay (s)	10.5	4.0		71.6		68.6	
Level of Service	B	A		E		E	
Approach Delay (s)	10.3				0.0	68.6	
Approach LOS	B				A	E	
<b>Intersection Summary</b>							
HCM 2000 Control Delay			12.6		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.77				
Actuated Cycle Length (s)			150.0		Sum of lost time (s)		32.1
Intersection Capacity Utilization			70.6%		ICU Level of Service		C
Analysis Period (min)			15				

c Critical Lane Group

# Timings

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

Existing (Weekend) PM

10/11/2021



Lane Group	EBT	EBR	WBL2	WBL	NBL	NWL	NWR	Ø2	Ø3	Ø7
Lane Configurations	↑↑↑	↑		↓	↓	↓				
Traffic Volume (vph)	2907	54	32	0	0	86	1			
Future Volume (vph)	2907	54	32	0	0	86	1			
Confl. Peds. (#/hr)		2	2	2						
Confl. Bikes (#/hr)		4								
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Heavy Vehicles (%)	2%	2%	3%	2%	2%	2%	2%			
Shared Lane Traffic (%)										
Lane Group Flow (vph)	3060	57	0	34	0	92	0			
Turn Type	NA	Perm	Prot	Prot	Prot	Prot				
Protected Phases	6		5	5	8	3 7		2	3	7
Permitted Phases		6								
Detector Phase	6	6	5	5	8	7				
Switch Phase										
Minimum Initial (s)	20.0	20.0	5.0	5.0	10.0			20.0	1.0	7.0
Minimum Split (s)	27.3	27.3	12.3	12.3	16.0			27.3	29.0	13.0
Total Split (s)	57.0	57.0	19.0	19.0	32.0			121.0	29.0	13.0
Total Split (%)	38.0%	38.0%	12.7%	12.7%	21.3%			81%	19%	9%
Yellow Time (s)	4.8	4.8	4.8	4.8	4.0			4.8	4.0	4.0
All-Red Time (s)	2.5	2.5	2.0	2.0	2.0			2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0					
Total Lost Time (s)	7.3	7.3		6.8	6.0					
Lead/Lag	Lead	Lead	Lag	Lag	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	C-Max	C-Max	None	None	None			C-Max	None	None
v/c Ratio	0.75	0.05		0.39		0.46				
Control Delay	10.6	4.5		81.0		11.7				
Queue Delay	0.0	0.0		0.0		0.0				
Total Delay	10.6	4.5		81.0		11.7				
Queue Length 50th (ft)	535	12		33		0				
Queue Length 95th (ft)	642	25		71		27				
Internal Link Dist (ft)	231				430	189				
Turn Bay Length (ft)		175								
Base Capacity (vph)	4097	1208		142		200				
Starvation Cap Reductn	0	0		0		0				
Spillback Cap Reductn	0	0		0		0				
Storage Cap Reductn	0	0		0		0				
Reduced v/c Ratio	0.75	0.05		0.24		0.46				

### Intersection Summary

Cycle Length: 150

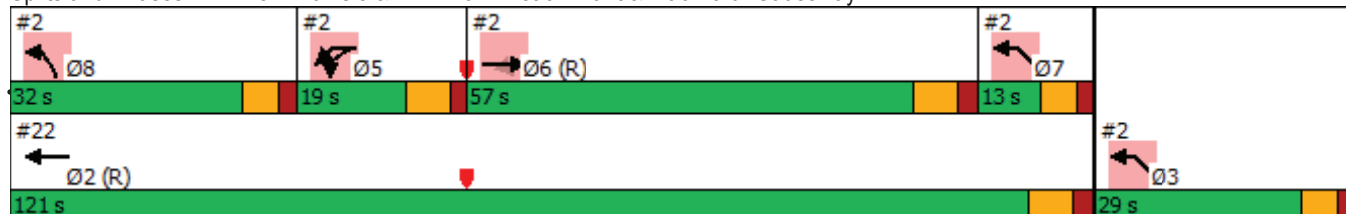
Actuated Cycle Length: 150

Offset: 81 (54%), Referenced to phase 6:EBT and 2:, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway















# HCM Signalized Intersection Capacity Analysis

## 3: Alton Road & 5th Street

Existing (Weekend) AM













10/12/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑↑	↑
Traffic Volume (vph)	4	1058	633	33	965	131	271	145	38	59	170	499
Future Volume (vph)	4	1058	633	33	965	131	271	145	38	59	170	499
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.91	1.00	1.00	0.99	1.00	0.96			1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97			1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (prot)		3530	1443	1556	3539	1530	3400	1709			1839	1527
Flt Permitted		0.95	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (perm)		3359	1443	1556	3539	1530	3400	1709			1839	1527
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	1114	666	35	1016	138	285	153	40	62	179	525
RTOR Reduction (vph)	0	0	237	0	0	53	0	6	0	0	0	0
Lane Group Flow (vph)	0	1118	429	35	1016	85	285	187	0	0	241	525
Confl. Peds. (#/hr)			46	46			2		58	58		2
Confl. Bikes (#/hr)			5			8			9			19
Heavy Vehicles (%)	75%	2%	2%	16%	2%	4%	3%	4%	2%	2%	2%	4%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Actuated Green, G (s)		85.5	85.5	6.8	98.3	98.3	19.4	19.4			24.3	160.0
Effective Green, g (s)		85.5	85.5	6.8	98.3	98.3	19.4	19.4			24.3	160.0
Actuated g/C Ratio		0.53	0.53	0.04	0.61	0.61	0.12	0.12			0.15	1.00
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	1.0	3.0	3.0			3.5	
Lane Grp Cap (vph)		1794	771	66	2174	939	412	207			279	1527
v/s Ratio Prot				0.02	c0.29		0.08	c0.11			c0.13	
v/s Ratio Perm		c0.33	0.30			0.06						0.34
v/c Ratio		0.62	0.56	0.53	0.47	0.09	0.69	0.90			0.86	0.34
Uniform Delay, d1		26.0	24.7	75.0	16.7	12.6	67.4	69.4			66.2	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2		1.6	2.9	4.0	0.7	0.2	5.0	36.8			23.5	0.6
Delay (s)		27.6	27.6	79.1	17.4	12.8	72.4	106.2			89.8	0.6
Level of Service		C	C	E	B	B	E	F			F	A
Approach Delay (s)		27.6			18.7			86.0			28.7	
Approach LOS		C			B			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.9									
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			160.0									
Intersection Capacity Utilization			97.4%									
Analysis Period (min)			15									
c Critical Lane Group												

Timings  
3: Alton Road & 5th Street

Existing (Weekend) AM

10/12/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑↑	↑
Traffic Volume (vph)	4	1058	633	33	965	131	271	145	38	59	170	499
Future Volume (vph)	4	1058	633	33	965	131	271	145	38	59	170	499
Confl. Peds. (#/hr)			46	46			2		58	58		2
Confl. Bikes (#/hr)			5			8			9			19
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
Heavy Vehicles (%)	75%	2%	2%	16%	2%	4%	3%	4%	2%	2%	2%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1118	666	35	1016	138	285	193	0	0	241	525
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Detector Phase	2	2	2	1	6	6	3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	35.0	35.0	35.0	11.0	13.0	13.0	23.0	23.0		31.0	31.0	
Total Split (s)	86.0	86.0	86.0	16.0	102.0	102.0	26.0	26.0		32.0	32.0	
Total Split (%)	53.8%	53.8%	53.8%	10.0%	63.8%	63.8%	16.3%	16.3%		20.0%	20.0%	
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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
v/c Ratio		0.61	0.66	0.47	0.47	0.14	0.69	0.91			0.87	0.34
Control Delay		28.3	9.4	92.8	17.9	2.2	76.8	107.5			94.3	0.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay		28.3	9.4	92.8	17.9	2.2	76.8	107.5			94.3	0.6
Queue Length 50th (ft)		440	106	36	302	0	149	195			247	0
Queue Length 95th (ft)		532	256	77	356	29	202	#344			#383	0
Internal Link Dist (ft)		300			275			278			324	
Turn Bay Length (ft)			225	125								
Base Capacity (vph)		1822	1015	97	2175	993	425	219			298	1527
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		0.61	0.66	0.36	0.47	0.14	0.67	0.88			0.81	0.34

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 55 (34%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Timings  
3: Alton Road & 5th Street

Existing (Weekend) AM  
10/12/2021

Splits and Phases: 3: Alton Road & 5th Street















# HCM Signalized Intersection Capacity Analysis

## 3: Alton Road & 5th Street

Existing (Weekend) PM













10/12/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑↑	↑
Traffic Volume (vph)	4	1190	588	33	1363	148	422	167	34	53	208	723
Future Volume (vph)	4	1190	588	33	1363	148	422	167	34	53	208	723
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.93	1.00	1.00	0.98	1.00	0.98			1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97			1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (prot)		3530	1477	1556	3539	1557	3433	1758			1844	1560
Flt Permitted		0.95	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (perm)		3354	1477	1556	3539	1557	3433	1758			1844	1560
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)	4	1227	606	34	1405	153	435	172	35	55	214	745
RTOR Reduction (vph)	0	0	200	0	0	51	0	4	0	0	0	0
Lane Group Flow (vph)	0	1231	406	34	1405	102	435	203	0	0	269	745
Confl. Peds. (#/hr)			31	31			2		42	42		2
Confl. Bikes (#/hr)			12			13			9			11
Heavy Vehicles (%)	75%	2%	2%	16%	2%	2%	2%	3%	2%	2%	2%	2%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Actuated Green, G (s)		84.0	84.0	6.7	96.7	96.7	20.0	20.0			25.3	160.0
Effective Green, g (s)		84.0	84.0	6.7	96.7	96.7	20.0	20.0			25.3	160.0
Actuated g/C Ratio		0.52	0.52	0.04	0.60	0.60	0.12	0.12			0.16	1.00
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	1.0	3.0	3.0			3.5	
Lane Grp Cap (vph)		1760	775	65	2138	941	429	219			291	1560
v/s Ratio Prot				0.02	c0.40		c0.13	0.12			c0.15	
v/s Ratio Perm		c0.37	0.27			0.07						0.48
v/c Ratio		0.70	0.52	0.52	0.66	0.11	1.01	0.93			0.92	0.48
Uniform Delay, d1		28.5	24.9	75.1	20.8	13.4	70.0	69.3			66.4	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2		2.3	2.5	3.5	1.6	0.2	47.0	40.3			33.7	1.1
Delay (s)		30.9	27.4	78.6	22.4	13.6	117.0	109.6			100.1	1.1
Level of Service		C	C	E	C	B	F	F			F	A
Approach Delay (s)		29.7			22.7			114.6			27.3	
Approach LOS		C			C			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			37.8									
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			160.0									
Intersection Capacity Utilization			106.2%									
Analysis Period (min)			15									
c Critical Lane Group												



Timings  
3: Alton Road & 5th Street

Existing (Weekend) PM  
10/12/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑	↑
Traffic Volume (vph)	4	1190	588	33	1363	148	422	167	34	53	208	723
Future Volume (vph)	4	1190	588	33	1363	148	422	167	34	53	208	723
Confl. Peds. (#/hr)			31	31			2		42	42		2
Confl. Bikes (#/hr)			12			13			9			11
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
Heavy Vehicles (%)	75%	2%	2%	16%	2%	2%	2%	3%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1231	606	34	1405	153	435	207	0	0	269	745
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Detector Phase	2	2	2	1	6	6	3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	35.0	35.0	35.0	11.0	13.0	13.0	23.0	23.0		31.0	31.0	
Total Split (s)	86.0	86.0	86.0	16.0	102.0	102.0	26.0	26.0		32.0	32.0	
Total Split (%)	53.8%	53.8%	53.8%	10.0%	63.8%	63.8%	16.3%	16.3%		20.0%	20.0%	
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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
v/c Ratio		0.69	0.62	0.45	0.66	0.15	1.01	0.92			0.92	0.48
Control Delay		31.3	10.6	92.2	22.8	3.5	114.6	109.6			101.7	1.0
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay		31.3	10.6	92.2	22.8	3.5	114.6	109.6			101.7	1.0
Queue Length 50th (ft)		511	127	35	494	10	~246	213			280	0
Queue Length 95th (ft)		614	263	74	569	42	#361	#376			#449	0
Internal Link Dist (ft)		300			275			278			324	
Turn Bay Length (ft)			225	125								
Base Capacity (vph)		1784	982	97	2138	991	429	224			299	1560
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		0.69	0.62	0.35	0.66	0.15	1.01	0.92			0.90	0.48

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 55 (34%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 110

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.

Timings  
3: Alton Road & 5th Street

Existing (Weekend) PM  
10/12/2021

Splits and Phases: 3: Alton Road & 5th Street



**Intersection**

Int Delay, s/veh 0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑		↑
Traffic Vol, veh/h	2669	0	0	37	0	30
Future Vol, veh/h	2669	0	0	37	0	30
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	11
Mvmt Flow	2809	0	0	39	0	32

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	-	- 1406
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	-	- 6.4
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	-	- -4.0045
Pot Cap-1 Maneuver	-	0	0 - 146
Stage 1	-	0	0 -
Stage 2	-	0	0 -
Platoon blocked, %	-		-
Mov Cap-1 Maneuver	-	-	- 146
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	36.3
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	146	-	-
HCM Lane V/C Ratio	0.216	-	-
HCM Control Delay (s)	36.3	-	-
HCM Lane LOS	E	-	-
HCM 95th %tile Q(veh)	0.8	-	-

**Intersection**

Int Delay, s/veh 0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑		↑
Traffic Vol, veh/h	2920	0	0	32	0	32
Future Vol, veh/h	2920	0	0	32	0	32
Conflicting Peds, #/hr	0	3	3	0	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	7
Mvmt Flow	3074	0	0	34	0	34

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	-	- 1540
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	-	- 6.4
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	-	- -3.9665
Pot Cap-1 Maneuver	-	0	0 - 122
Stage 1	-	0	0 -
Stage 2	-	0	0 -
Platoon blocked, %	-		-
Mov Cap-1 Maneuver	-	-	- 122
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	45.4
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	122	-	-
HCM Lane V/C Ratio	0.276	-	-
HCM Control Delay (s)	45.4	-	-
HCM Lane LOS	E	-	-
HCM 95th %tile Q(veh)	1	-	-
























## **Weekend Future without Project Conditions**

# HCM Signalized Intersection Capacity Analysis

## 1: Ferry Exit/Bridge Road & MacArthur Causeway

Future without Project (Weekend) AM
























10/06/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	16	2763	0	0	1983	9	0	0	0	8	0	6
Future Volume (vph)	16	2763	0	0	1983	9	0	0	0	8	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8			6.8	6.8				6.8	4.0	
Lane Util. Factor	1.00	0.91			0.91	1.00				1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00	0.97				1.00	0.90	
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00	1.00	
Frt	1.00	1.00			1.00	0.85				1.00	0.86	
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1597	5085			5085	1541				1583	0	
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (perm)	1597	5085			5085	1541				1583	0	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	17	2939	0	0	2110	10	0	0	0	9	0	6
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	0	0	6	0
Lane Group Flow (vph)	17	2939	0	0	2110	8	0	0	0	9	0	0
Confl. Peds. (#/hr)			4	4						1		
Confl. Bikes (#/hr)			13			14						2
Heavy Vehicles (%)	13%	2%	2%	2%	2%	2%	2%	2%	2%	14%	2%	2%
Turn Type	Prot	NA			NA	Perm				Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Actuated Green, G (s)	7.8	161.9			150.7	150.7				4.3	0.0	
Effective Green, g (s)	7.8	161.9			150.7	150.7				4.3	0.0	
Actuated g/C Ratio	0.04	0.85			0.79	0.79				0.02	0.00	
Clearance Time (s)		6.8			6.8	6.8				6.8		
Vehicle Extension (s)		1.0			1.0	1.0				3.0		
Lane Grp Cap (vph)	65	4332			4033	1222				35	0	
v/s Ratio Prot	c0.01	c0.58			0.41					c0.01		
v/s Ratio Perm						0.01						
v/c Ratio	0.26	0.68			0.52	0.01				0.26	0.00	
Uniform Delay, d1	88.3	4.9			6.9	4.1				91.3	95.0	
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	
Incremental Delay, d2	1.6	0.9			0.5	0.0				3.9	0.0	
Delay (s)	89.9	5.8			7.4	4.1				95.2	95.0	
Level of Service	F	A			A	A				F	F	
Approach Delay (s)		6.3			7.4			0.0			95.1	
Approach LOS		A			A			A			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			7.0				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			190.0				Sum of lost time (s)			34.0		
Intersection Capacity Utilization			Err%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Future without Project (Weekend) AM

10/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	16	2763	0	0	1983	9	0	0	0	8	0	6
Future Volume (vph)	16	2763	0	0	1983	9	0	0	0	8	0	6
Confl. Peds. (#/hr)			4	4						1		
Confl. Bikes (#/hr)			13			14						2
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	13%	2%	2%	2%	2%	2%	2%	2%	2%	14%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	2939	0	0	2110	10	0	0	0	9	6	0
Turn Type	Prot	NA			NA	Perm				Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Detector Phase	1	6			2	2	7	7		8		
Switch Phase												
Minimum Initial (s)		18.0			18.0	18.0	1.0	1.0		5.0		
Minimum Split (s)		24.8			24.8	24.8	14.0	14.0		20.8		
Total Split (s)		124.0			100.0	100.0	21.0	21.0		21.0		
Total Split (%)		65.3%			52.6%	52.6%	11.1%	11.1%		11.1%		
Yellow Time (s)		4.8			4.8	4.8	4.8	4.8		4.8		
All-Red Time (s)		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		
Total Lost Time (s)		6.8			6.8	6.8		6.8		6.8		
Lead/Lag					Lag	Lag	Lag	Lag				
Lead-Lag Optimize?					Yes	Yes	Yes	Yes				
Recall Mode		C-Max			C-Max	C-Max	None	None		None		
v/c Ratio	0.19	0.63			0.48	0.01				0.14	0.03	
Control Delay	78.1	5.5			6.7	0.0				90.4	0.0	
Queue Delay	0.0	0.0			0.4	0.0				0.0	0.0	
Total Delay	78.1	5.5			7.0	0.0				90.4	0.0	
Queue Length 50th (ft)	21	0			134	0				11	0	
Queue Length 95th (ft)	40	841			582	0				32	0	
Internal Link Dist (ft)		886			389			350			366	
Turn Bay Length (ft)	150					100						
Base Capacity (vph)	173	4698			4434	1356				118	178	
Starvation Cap Reductn	0	0			1492	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	0.10	0.63			0.72	0.01				0.08	0.03	

Intersection Summary

Cycle Length: 190

Actuated Cycle Length: 190

Offset: 96 (51%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 1: Ferry Exit/Bridge Road & MacArthur Causeway



Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Future without Project (Weekend) AM

10/06/2021

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	7.0	1.0
Minimum Split (s)	13.8	23.8
Total Split (s)	24.0	24.0
Total Split (%)	13%	13%
Yellow Time (s)	4.8	4.8
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		


























# HCM Signalized Intersection Capacity Analysis

## 1: Ferry Exit/Bridge Road & MacArthur Causeway

Future without Project (Weekend) PM
























10/06/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	19	3014	0	0	2923	14	0	0	0	4	0	23
Future Volume (vph)	19	3014	0	0	2923	14	0	0	0	4	0	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8			6.8	6.8				6.8	4.0	
Lane Util. Factor	1.00	0.91			0.91	1.00				1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00	0.97				1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00	1.00	
Frt	1.00	1.00			1.00	0.85				1.00	0.86	
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1626	5085			5085	1541				1770	0	
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (perm)	1626	5085			5085	1541				1770	0	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	20	3206	0	0	3110	15	0	0	0	4	0	24
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	0	0	24	0
Lane Group Flow (vph)	20	3206	0	0	3110	13	0	0	0	4	0	0
Confl. Peds. (#/hr)	6		1	1		6						
Confl. Bikes (#/hr)			5			7						
Heavy Vehicles (%)	11%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	5%
Turn Type	Prot	NA			NA	Perm				Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Actuated Green, G (s)	5.2	175.0			163.0	163.0				1.4	0.0	
Effective Green, g (s)	5.2	175.0			163.0	163.0				1.4	0.0	
Actuated g/C Ratio	0.03	0.92			0.86	0.86				0.01	0.00	
Clearance Time (s)		6.8			6.8	6.8				6.8		
Vehicle Extension (s)		1.0			1.0	1.0				3.0		
Lane Grp Cap (vph)	44	4683			4362	1322				13	0	
v/s Ratio Prot	0.01	c0.63			c0.61					c0.00		
v/s Ratio Perm						0.01						
v/c Ratio	0.45	0.68			0.71	0.01				0.31	0.00	
Uniform Delay, d1	91.0	1.6			4.9	1.9				93.8	95.0	
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	
Incremental Delay, d2	5.3	0.8			1.0	0.0				13.0	0.0	
Delay (s)	96.3	2.4			6.0	1.9				106.8	95.0	
Level of Service	F	A			A	A				F	F	
Approach Delay (s)		3.0			5.9			0.0			96.7	
Approach LOS		A			A			A			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			4.9				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			190.0				Sum of lost time (s)			34.0		
Intersection Capacity Utilization			Err%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Future without Project (Weekend) PM

10/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	19	3014	0	0	2923	14	0	0	0	4	0	23
Future Volume (vph)	19	3014	0	0	2923	14	0	0	0	4	0	23
Confl. Peds. (#/hr)	6		1	1		6						
Confl. Bikes (#/hr)			5			7						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	11%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	3206	0	0	3110	15	0	0	0	4	24	0
Turn Type	Prot	NA			NA	Perm				Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Detector Phase	1	6			2	2	7	7		8		
Switch Phase												
Minimum Initial (s)		18.0			18.0	18.0	1.0	1.0		5.0		
Minimum Split (s)		24.8			24.8	24.8	14.0	14.0		20.8		
Total Split (s)		124.0			100.0	100.0	21.0	21.0		21.0		
Total Split (%)		65.3%			52.6%	52.6%	11.1%	11.1%		11.1%		
Yellow Time (s)		4.8			4.8	4.8	4.8	4.8		4.8		
All-Red Time (s)		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		
Total Lost Time (s)		6.8			6.8	6.8		6.8		6.8		
Lead/Lag					Lag	Lag	Lag	Lag				
Lead-Lag Optimize?					Yes	Yes	Yes	Yes				
Recall Mode		C-Max			C-Max	C-Max	None	None		None		
v/c Ratio	0.29	0.64			0.67	0.01				0.07	0.13	
Control Delay	98.9	1.5			4.6	0.0				91.5	0.0	
Queue Delay	0.0	0.0			0.7	0.0				0.0	0.0	
Total Delay	98.9	1.5			5.3	0.0				91.5	0.0	
Queue Length 50th (ft)	25	0			304	0				5	0	
Queue Length 95th (ft)	58	335			670	0				20	0	
Internal Link Dist (ft)		886			389			350			366	
Turn Bay Length (ft)	150					100						
Base Capacity (vph)	147	4975			4654	1415				132	178	
Starvation Cap Reductn	0	0			1053	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	0.64			0.86	0.01				0.03	0.13	

Intersection Summary

Cycle Length: 190

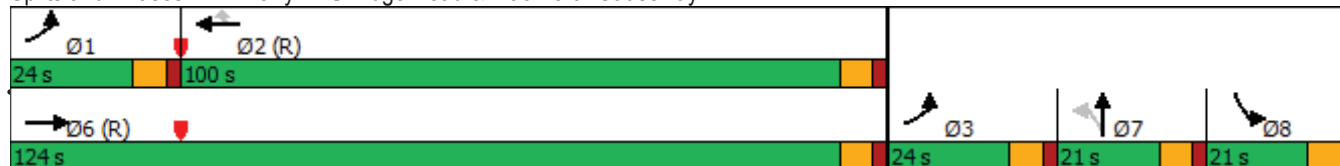
Actuated Cycle Length: 190

Offset: 96 (51%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 1: Ferry Exit/Bridge Road & MacArthur Causeway



Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Future without Project (Weekend) PM

10/06/2021

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	7.0	1.0
Minimum Split (s)	13.8	23.8
Total Split (s)	24.0	24.0
Total Split (%)	13%	13%
Yellow Time (s)	4.8	4.8
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

# HCM Signalized Intersection Capacity Analysis

Future without Project (Weekend) AM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021



Movement	EBT	EBR	WBL2	WBL	NBL	NWL	NWR
Lane Configurations	↑↑↑	↑		↓	↓	↓	
Traffic Volume (vph)	2723	55	38	0	0	41	1
Future Volume (vph)	2723	55	38	0	0	41	1
Ideal Flow (vphpl)	1950	1900	1950	1900	1950	1900	1900
Lane Width	12	12	8	12	12	12	12
Total Lost time (s)	7.3	7.3		6.8		6.0	
Lane Util. Factor	0.91	1.00		1.00		1.00	
Frpb, ped/bikes	1.00	0.97		1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00		1.00	
Frt	1.00	0.85		1.00		1.00	
Flt Protected	1.00	1.00		0.95		0.95	
Satd. Flow (prot)	5219	1483		1626		1720	
Flt Permitted	1.00	1.00		0.95		0.95	
Satd. Flow (perm)	5219	1483		1626		1720	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2866	58	40	0	0	43	1
RTOR Reduction (vph)	0	0	0	0	0	42	0
Lane Group Flow (vph)	2866	58	0	40	0	2	0
Confl. Peds. (#/hr)		2	2	2			
Confl. Bikes (#/hr)		11					1
Heavy Vehicles (%)	2%	6%	11%	2%	2%	5%	2%
Turn Type	NA	Perm	Prot	Prot	Prot	Prot	
Protected Phases	6		5	5	8	3	7
Permitted Phases		6					
Actuated Green, G (s)	117.1	117.1		7.2		5.6	
Effective Green, g (s)	117.1	117.1		7.2		5.6	
Actuated g/C Ratio	0.78	0.78		0.05		0.04	
Clearance Time (s)	7.3	7.3		6.8			
Vehicle Extension (s)	1.0	1.0		2.0			
Lane Grp Cap (vph)	4074	1157		78		64	
v/s Ratio Prot	c0.55			c0.02		c0.00	
v/s Ratio Perm		0.04					
v/c Ratio	0.70	0.05		0.51		0.03	
Uniform Delay, d1	8.0	3.8		69.7		69.6	
Progression Factor	1.00	1.00		1.00		1.00	
Incremental Delay, d2	1.0	0.1		2.4		0.2	
Delay (s)	9.0	3.8		72.0		69.7	
Level of Service	A	A		E		E	
Approach Delay (s)	8.9				0.0	69.7	
Approach LOS	A				A	E	

### Intersection Summary

HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	32.1
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# Timings

Future without Project (Weekend) AM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021



Lane Group	EBT	EBR	WBL2	WBL	NBL	NWL	NWR	Ø2	Ø3	Ø7
Lane Configurations	↑↑↑	↑		↓	↓	↓				
Traffic Volume (vph)	2723	55	38	0	0	41	1			
Future Volume (vph)	2723	55	38	0	0	41	1			
Confl. Peds. (#/hr)		2	2	2						
Confl. Bikes (#/hr)		11					1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Heavy Vehicles (%)	2%	6%	11%	2%	2%	5%	2%			
Shared Lane Traffic (%)										
Lane Group Flow (vph)	2866	58	0	40	0	44	0			
Turn Type	NA	Perm	Prot	Prot	Prot	Prot				
Protected Phases	6		5	5	8	3 7		2	3	7
Permitted Phases		6								
Detector Phase	6	6	5	5	8	7				
Switch Phase										
Minimum Initial (s)	20.0	20.0	5.0	5.0	10.0			20.0	1.0	7.0
Minimum Split (s)	27.3	27.3	12.3	12.3	16.0			27.3	29.0	13.0
Total Split (s)	57.0	57.0	19.0	19.0	32.0			121.0	29.0	13.0
Total Split (%)	38.0%	38.0%	12.7%	12.7%	21.3%			81%	19%	9%
Yellow Time (s)	4.8	4.8	4.8	4.8	4.0			4.8	4.0	4.0
All-Red Time (s)	2.5	2.5	2.0	2.0	2.0			2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0					
Total Lost Time (s)	7.3	7.3		6.8	6.0					
Lead/Lag	Lead	Lead	Lag	Lag	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	C-Max	C-Max	None	None	None			C-Max	None	None
v/c Ratio	0.68	0.05		0.45		0.22				
Control Delay	9.4	4.7		83.8		2.6				
Queue Delay	0.0	0.0		0.0		0.0				
Total Delay	9.4	4.7		83.8		2.6				
Queue Length 50th (ft)	472	12		39		0				
Queue Length 95th (ft)	574	26		79		0				
Internal Link Dist (ft)	231				430	189				
Turn Bay Length (ft)		175								
Base Capacity (vph)	4214	1187		132		198				
Starvation Cap Reductn	0	0		0		0				
Spillback Cap Reductn	0	0		0		0				
Storage Cap Reductn	0	0		0		0				
Reduced v/c Ratio	0.68	0.05		0.30		0.22				

### Intersection Summary

Cycle Length: 150

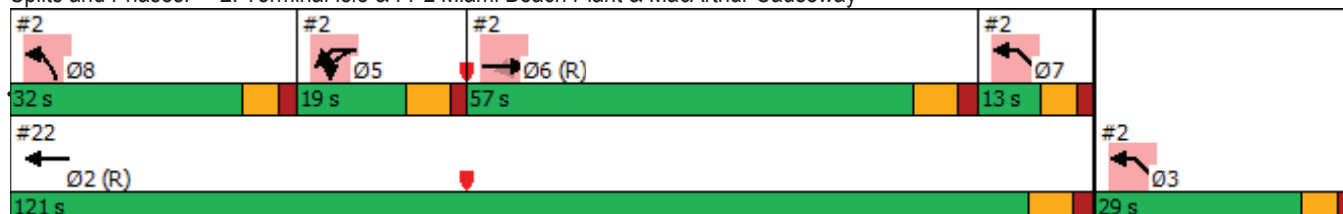
Actuated Cycle Length: 150

Offset: 81 (54%), Referenced to phase 6:EBT and 2:, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway



# HCM Signalized Intersection Capacity Analysis

Future without Project (Weekend) PM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021



Movement	EBT	EBR	WBL2	WBL	NBL	NWL	NWR
Lane Configurations	↑↑↑	↑		↓	↓	↓	
Traffic Volume (vph)	2965	55	32	0	0	88	1
Future Volume (vph)	2965	55	32	0	0	88	1
Ideal Flow (vphpl)	1950	1900	1950	1900	1950	1900	1900
Lane Width	12	12	8	12	12	12	12
Total Lost time (s)	7.3	7.3		6.8		6.0	
Lane Util. Factor	0.91	1.00		1.00		1.00	
Frpb, ped/bikes	1.00	0.98		1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00		1.00	
Frt	1.00	0.85		1.00		1.00	
Flt Protected	1.00	1.00		0.95		0.95	
Satd. Flow (prot)	5219	1547		1752		1772	
Flt Permitted	1.00	1.00		0.95		0.95	
Satd. Flow (perm)	5219	1547		1752		1772	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3121	58	34	0	0	93	1
RTOR Reduction (vph)	0	0	0	0	0	90	0
Lane Group Flow (vph)	3121	58	0	34	0	4	0
Confl. Peds. (#/hr)		2	2	2			
Confl. Bikes (#/hr)		4					
Heavy Vehicles (%)	2%	2%	3%	2%	2%	2%	2%
Turn Type	NA	Perm	Prot	Prot	Prot	Prot	
Protected Phases	6		5	5	8	3	7
Permitted Phases		6					
Actuated Green, G (s)	116.4	116.4		6.5		7.0	
Effective Green, g (s)	116.4	116.4		6.5		7.0	
Actuated g/C Ratio	0.78	0.78		0.04		0.05	
Clearance Time (s)	7.3	7.3		6.8			
Vehicle Extension (s)	1.0	1.0		2.0			
Lane Grp Cap (vph)	4049	1200		75		82	
v/s Ratio Prot	c0.60			c0.02		c0.00	
v/s Ratio Perm		0.04					
v/c Ratio	0.77	0.05		0.45		0.05	
Uniform Delay, d1	9.4	3.9		70.0		68.3	
Progression Factor	1.00	1.00		1.00		1.00	
Incremental Delay, d2	1.5	0.1		1.6		0.3	
Delay (s)	10.8	4.0		71.6		68.6	
Level of Service	B	A		E		E	
Approach Delay (s)	10.7				0.0	68.6	
Approach LOS	B				A	E	

### Intersection Summary

HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	32.1
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# Timings

Future without Project (Weekend) PM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021



Lane Group	EBT	EBR	WBL2	WBL	NBL	NWL	NWR	Ø2	Ø3	Ø7
Lane Configurations	↑↑↑	↑		↓	↓	↓				
Traffic Volume (vph)	2965	55	32	0	0	88	1			
Future Volume (vph)	2965	55	32	0	0	88	1			
Confl. Peds. (#/hr)		2	2	2						
Confl. Bikes (#/hr)		4								
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Heavy Vehicles (%)	2%	2%	3%	2%	2%	2%	2%			
Shared Lane Traffic (%)										
Lane Group Flow (vph)	3121	58	0	34	0	94	0			
Turn Type	NA	Perm	Prot	Prot	Prot	Prot				
Protected Phases	6		5	5	8	3 7		2	3	7
Permitted Phases		6								
Detector Phase	6	6	5	5	8	7				
Switch Phase										
Minimum Initial (s)	20.0	20.0	5.0	5.0	10.0			20.0	1.0	7.0
Minimum Split (s)	27.3	27.3	12.3	12.3	16.0			27.3	29.0	13.0
Total Split (s)	57.0	57.0	19.0	19.0	32.0			121.0	29.0	13.0
Total Split (%)	38.0%	38.0%	12.7%	12.7%	21.3%			81%	19%	9%
Yellow Time (s)	4.8	4.8	4.8	4.8	4.0			4.8	4.0	4.0
All-Red Time (s)	2.5	2.5	2.0	2.0	2.0			2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0					
Total Lost Time (s)	7.3	7.3		6.8	6.0					
Lead/Lag	Lead	Lead	Lag	Lag	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	C-Max	C-Max	None	None	None			C-Max	None	None
v/c Ratio	0.76	0.05		0.39		0.47				
Control Delay	11.0	4.5		81.0		12.3				
Queue Delay	0.0	0.0		0.0		0.0				
Total Delay	11.0	4.5		81.0		12.3				
Queue Length 50th (ft)	561	12		33		0				
Queue Length 95th (ft)	673	25		71		30				
Internal Link Dist (ft)	231				430	189				
Turn Bay Length (ft)		175								
Base Capacity (vph)	4097	1208		142		200				
Starvation Cap Reductn	0	0		0		0				
Spillback Cap Reductn	0	0		0		0				
Storage Cap Reductn	0	0		0		0				
Reduced v/c Ratio	0.76	0.05		0.24		0.47				

### Intersection Summary

Cycle Length: 150

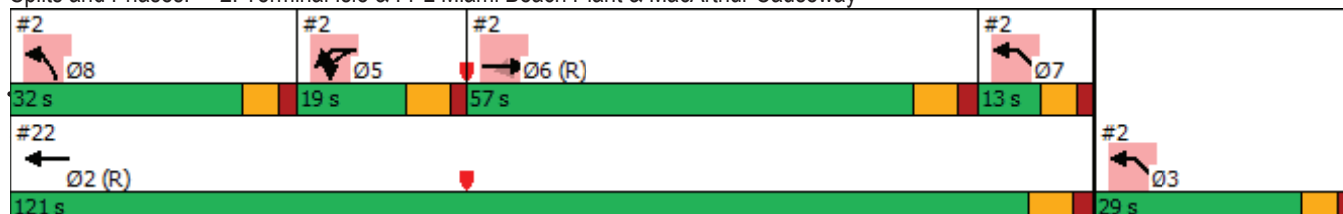
Actuated Cycle Length: 150

Offset: 81 (54%), Referenced to phase 6:EBT and 2:, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway















# HCM Signalized Intersection Capacity Analysis

## 3: Alton Road & 5th Street

Future without Project (Weekend) AM

10/12/2021













												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑↑	↑
Traffic Volume (vph)	4	1079	646	34	984	134	277	148	39	61	173	509
Future Volume (vph)	4	1079	646	34	984	134	277	148	39	61	173	509
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.91	1.00	1.00	0.99	1.00	0.96			1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97			1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (prot)		3530	1443	1556	3539	1530	3400	1709			1839	1527
Flt Permitted		0.95	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (perm)		3359	1443	1556	3539	1530	3400	1709			1839	1527
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	1136	680	36	1036	141	292	156	41	64	182	536
RTOR Reduction (vph)	0	0	239	0	0	55	0	6	0	0	0	0
Lane Group Flow (vph)	0	1140	441	36	1036	86	292	191	0	0	246	536
Confl. Peds. (#/hr)			46	46			2		58	58		2
Confl. Bikes (#/hr)			5			8			9			19
Heavy Vehicles (%)	75%	2%	2%	16%	2%	4%	3%	4%	2%	2%	2%	4%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Actuated Green, G (s)		85.1	85.1	6.9	98.0	98.0	19.5	19.5			24.5	160.0
Effective Green, g (s)		85.1	85.1	6.9	98.0	98.0	19.5	19.5			24.5	160.0
Actuated g/C Ratio		0.53	0.53	0.04	0.61	0.61	0.12	0.12			0.15	1.00
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	1.0	3.0	3.0			3.5	
Lane Grp Cap (vph)		1786	767	67	2167	937	414	208			281	1527
v/s Ratio Prot				0.02	c0.29		0.09	c0.11			c0.13	
v/s Ratio Perm		c0.34	0.31			0.06						0.35
v/c Ratio		0.64	0.58	0.54	0.48	0.09	0.71	0.92			0.88	0.35
Uniform Delay, d1		26.5	25.3	75.0	17.0	12.7	67.5	69.5			66.3	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2		1.8	3.1	4.1	0.8	0.2	5.4	39.8			25.2	0.6
Delay (s)		28.3	28.4	79.1	17.7	12.9	72.9	109.2			91.5	0.6
Level of Service		C	C	E	B	B	E	F			F	A
Approach Delay (s)		28.3			19.0			87.5			29.2	
Approach LOS		C			B			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			32.6									
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			160.0									
Intersection Capacity Utilization			99.0%									
Analysis Period (min)			15									
c Critical Lane Group												



Timings  
3: Alton Road & 5th Street

Future without Project (Weekend) AM

10/12/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑↑	↑
Traffic Volume (vph)	4	1079	646	34	984	134	277	148	39	61	173	509
Future Volume (vph)	4	1079	646	34	984	134	277	148	39	61	173	509
Confl. Peds. (#/hr)			46	46			2		58	58		2
Confl. Bikes (#/hr)			5			8			9			19
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
Heavy Vehicles (%)	75%	2%	2%	16%	2%	4%	3%	4%	2%	2%	2%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1140	680	36	1036	141	292	197	0	0	246	536
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Detector Phase	2	2	2	1	6	6	3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	35.0	35.0	35.0	11.0	13.0	13.0	23.0	23.0		31.0	31.0	
Total Split (s)	86.0	86.0	86.0	16.0	102.0	102.0	26.0	26.0		32.0	32.0	
Total Split (%)	53.8%	53.8%	53.8%	10.0%	63.8%	63.8%	16.3%	16.3%		20.0%	20.0%	
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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
v/c Ratio		0.63	0.67	0.47	0.48	0.14	0.70	0.92			0.88	0.35
Control Delay		28.9	10.2	93.3	18.2	2.2	77.3	109.4			95.5	0.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay		28.9	10.2	93.3	18.2	2.2	77.3	109.4			95.5	0.6
Queue Length 50th (ft)		454	121	37	310	0	153	199			252	0
Queue Length 95th (ft)		547	279	79	365	30	207	#355			#394	0
Internal Link Dist (ft)		300			275			278			324	
Turn Bay Length (ft)			225	125								
Base Capacity (vph)		1813	1013	97	2167	991	425	219			298	1527
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		0.63	0.67	0.37	0.48	0.14	0.69	0.90			0.83	0.35

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 55 (34%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

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

Queue shown is maximum after two cycles.

Timings  
3: Alton Road & 5th Street

Future without Project (Weekend) AM

10/12/2021

Splits and Phases: 3: Alton Road & 5th Street















# HCM Signalized Intersection Capacity Analysis

## 3: Alton Road & 5th Street

Future without Project (Weekend) PM













10/12/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑↑	↑
Traffic Volume (vph)	4	1214	600	34	1391	151	430	171	35	54	212	737
Future Volume (vph)	4	1214	600	34	1391	151	430	171	35	54	212	737
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.93	1.00	1.00	0.98	1.00	0.98			1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97			1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (prot)		3531	1477	1556	3539	1557	3433	1758			1844	1560
Flt Permitted		0.95	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (perm)		3354	1477	1556	3539	1557	3433	1758			1844	1560
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)	4	1252	619	35	1434	156	443	176	36	56	219	760
RTOR Reduction (vph)	0	0	201	0	0	51	0	4	0	0	0	0
Lane Group Flow (vph)	0	1256	418	35	1434	105	443	208	0	0	275	760
Confl. Peds. (#/hr)			31	31			2		42	42		2
Confl. Bikes (#/hr)			12			13			9			11
Heavy Vehicles (%)	75%	2%	2%	16%	2%	2%	2%	3%	2%	2%	2%	2%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Actuated Green, G (s)		83.6	83.6	6.8	96.4	96.4	20.0	20.0			25.6	160.0
Effective Green, g (s)		83.6	83.6	6.8	96.4	96.4	20.0	20.0			25.6	160.0
Actuated g/C Ratio		0.52	0.52	0.04	0.60	0.60	0.12	0.12			0.16	1.00
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	1.0	3.0	3.0			3.5	
Lane Grp Cap (vph)		1752	771	66	2132	938	429	219			295	1560
v/s Ratio Prot				0.02	c0.41		c0.13	0.12			c0.15	
v/s Ratio Perm		c0.37	0.28			0.07						0.49
v/c Ratio		0.72	0.54	0.53	0.67	0.11	1.03	0.95			0.93	0.49
Uniform Delay, d1		29.2	25.4	75.0	21.3	13.6	70.0	69.5			66.3	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2		2.6	2.7	4.0	1.7	0.2	52.1	45.8			35.2	1.1
Delay (s)		31.7	28.2	79.1	23.0	13.8	122.1	115.3			101.5	1.1
Level of Service		C	C	E	C	B	F	F			F	A
Approach Delay (s)		30.5			23.3			119.9			27.8	
Approach LOS		C			C			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			39.0									
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			160.0									
Intersection Capacity Utilization			108.0%									
Analysis Period (min)			15									
c Critical Lane Group												

Timings  
3: Alton Road & 5th Street

Future without Project (Weekend) PM

10/12/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑↑	↑
Traffic Volume (vph)	4	1214	600	34	1391	151	430	171	35	54	212	737
Future Volume (vph)	4	1214	600	34	1391	151	430	171	35	54	212	737
Confl. Peds. (#/hr)			31	31			2		42	42		2
Confl. Bikes (#/hr)			12			13			9			11
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
Heavy Vehicles (%)	75%	2%	2%	16%	2%	2%	2%	3%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1256	619	35	1434	156	443	212	0	0	275	760
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Detector Phase	2	2	2	1	6	6	3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	35.0	35.0	35.0	11.0	13.0	13.0	23.0	23.0		31.0	31.0	
Total Split (s)	86.0	86.0	86.0	16.0	102.0	102.0	26.0	26.0		32.0	32.0	
Total Split (%)	53.8%	53.8%	53.8%	10.0%	63.8%	63.8%	16.3%	16.3%		20.0%	20.0%	
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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
v/c Ratio		0.71	0.63	0.47	0.67	0.16	1.03	0.95			0.94	0.49
Control Delay		31.9	11.3	92.8	23.3	3.7	118.4	114.1			103.7	1.1
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay		31.9	11.3	92.8	23.3	3.7	118.4	114.1			103.7	1.1
Queue Length 50th (ft)		528	141	36	510	12	~255	219			287	0
Queue Length 95th (ft)		633	282	77	589	43	#370	#389			#464	0
Internal Link Dist (ft)		300			275			278			324	
Turn Bay Length (ft)			225	125								
Base Capacity (vph)		1778	981	97	2133	989	429	224			299	1560
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		0.71	0.63	0.36	0.67	0.16	1.03	0.95			0.92	0.49

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 55 (34%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 110

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.

Timings  
3: Alton Road & 5th Street

Future without Project (Weekend) PM

10/12/2021

Splits and Phases: 3: Alton Road & 5th Street



**Intersection**

Int Delay, s/veh 0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑		↑
Traffic Vol, veh/h	2723	0	0	38	0	30
Future Vol, veh/h	2723	0	0	38	0	30
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	11
Mvmt Flow	2866	0	0	40	0	32

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	-	- 1434
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	- 6.4
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	- 4.0045
Pot Cap-1 Maneuver	-	0	0 - 141
Stage 1	-	0	0 -
Stage 2	-	0	0 -
Platoon blocked, %	-		-
Mov Cap-1 Maneuver	-	-	- 141
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	37.8
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	141	-	-
HCM Lane V/C Ratio	0.224	-	-
HCM Control Delay (s)	37.8	-	-
HCM Lane LOS	E	-	-
HCM 95th %tile Q(veh)	0.8	-	-

Intersection						
Int Delay, s/veh	0.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑			↑		↗
Traffic Vol, veh/h	2979	0	0	32	0	32
Future Vol, veh/h	2979	0	0	32	0	32
Conflicting Peds, #/hr	0	3	3	0	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	7
Mvmt Flow	3136	0	0	34	0	34
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	-	1571
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-3.9665	
Pot Cap-1 Maneuver	-	0	0	-	0	117
Stage 1	-	0	0	-	0	-
Stage 2	-	0	0	-	0	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	-	117
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		47.8	
HCM LOS					E	
Minor Lane/Major Mvmt	NBLn1		EBT	WBT		
Capacity (veh/h)	117		-	-		
HCM Lane V/C Ratio	0.288		-	-		
HCM Control Delay (s)	47.8		-	-		
HCM Lane LOS	E		-	-		
HCM 95th %tile Q(veh)	1.1		-	-		

# **Weekend Future with Project Conditions**


























# HCM Signalized Intersection Capacity Analysis

## 1: Ferry Exit/Bridge Road & MacArthur Causeway

Future with Project (Weekend) AM
























10/06/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	16	2799	0	0	2009	9	0	0	0	9	0	6
Future Volume (vph)	16	2799	0	0	2009	9	0	0	0	9	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8			6.8	6.8				6.8	4.0	
Lane Util. Factor	1.00	0.91			0.91	1.00				1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00	0.97				1.00	0.90	
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00	1.00	
Frt	1.00	1.00			1.00	0.85				1.00	0.86	
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1597	5085			5085	1541				1583	0	
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (perm)	1597	5085			5085	1541				1583	0	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	17	2978	0	0	2137	10	0	0	0	10	0	6
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	0	0	6	0
Lane Group Flow (vph)	17	2978	0	0	2137	8	0	0	0	10	0	0
Confl. Peds. (#/hr)			4	4						1		
Confl. Bikes (#/hr)			13			14						2
Heavy Vehicles (%)	13%	2%	2%	2%	2%	2%	2%	2%	2%	14%	2%	2%
Turn Type	Prot	NA			NA	Perm				Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Actuated Green, G (s)	7.8	161.9			150.7	150.7				4.3	0.0	
Effective Green, g (s)	7.8	161.9			150.7	150.7				4.3	0.0	
Actuated g/C Ratio	0.04	0.85			0.79	0.79				0.02	0.00	
Clearance Time (s)		6.8			6.8	6.8				6.8		
Vehicle Extension (s)		1.0			1.0	1.0				3.0		
Lane Grp Cap (vph)	65	4332			4033	1222				35	0	
v/s Ratio Prot	c0.01	c0.59			0.42					c0.01		
v/s Ratio Perm						0.01						
v/c Ratio	0.26	0.69			0.53	0.01				0.29	0.00	
Uniform Delay, d1	88.3	5.0			7.0	4.1				91.3	95.0	
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	
Incremental Delay, d2	1.6	0.9			0.5	0.0				4.5	0.0	
Delay (s)	89.9	5.9			7.5	4.1				95.8	95.0	
Level of Service	F	A			A	A				F	F	
Approach Delay (s)		6.4			7.5			0.0			95.5	
Approach LOS		A			A			A			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			7.1				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			190.0				Sum of lost time (s)			34.0		
Intersection Capacity Utilization			Err%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Future with Project (Weekend) AM

10/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	16	2799	0	0	2009	9	0	0	0	9	0	6
Future Volume (vph)	16	2799	0	0	2009	9	0	0	0	9	0	6
Confl. Peds. (#/hr)			4	4						1		
Confl. Bikes (#/hr)			13			14						2
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	13%	2%	2%	2%	2%	2%	2%	2%	2%	14%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	2978	0	0	2137	10	0	0	0	10	6	0
Turn Type	Prot	NA			NA	Perm				Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Detector Phase	1	6			2	2	7	7		8		
Switch Phase												
Minimum Initial (s)		18.0			18.0	18.0	1.0	1.0		5.0		
Minimum Split (s)		24.8			24.8	24.8	14.0	14.0		20.8		
Total Split (s)		124.0			100.0	100.0	21.0	21.0		21.0		
Total Split (%)		65.3%			52.6%	52.6%	11.1%	11.1%		11.1%		
Yellow Time (s)		4.8			4.8	4.8	4.8	4.8		4.8		
All-Red Time (s)		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		
Total Lost Time (s)		6.8			6.8	6.8		6.8		6.8		
Lead/Lag					Lag	Lag	Lag	Lag				
Lead-Lag Optimize?					Yes	Yes	Yes	Yes				
Recall Mode		C-Max			C-Max	C-Max	None	None		None		
v/c Ratio	0.19	0.63			0.48	0.01				0.15	0.03	
Control Delay	78.1	5.6			6.8	0.0				91.0	0.0	
Queue Delay	0.0	0.0			0.4	0.0				0.0	0.0	
Total Delay	78.1	5.6			7.1	0.0				91.0	0.0	
Queue Length 50th (ft)	21	0			137	0				12	0	
Queue Length 95th (ft)	40	868			594	0				36	0	
Internal Link Dist (ft)		886			389			350			366	
Turn Bay Length (ft)	150					100						
Base Capacity (vph)	173	4697			4433	1356				118	178	
Starvation Cap Reductn	0	0			1478	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	0.10	0.63			0.72	0.01				0.08	0.03	

Intersection Summary

Cycle Length: 190

Actuated Cycle Length: 190

Offset: 96 (51%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 1: Ferry Exit/Bridge Road & MacArthur Causeway



Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Future with Project (Weekend) AM

10/06/2021
























Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	7.0	1.0
Minimum Split (s)	13.8	23.8
Total Split (s)	24.0	24.0
Total Split (%)	13%	13%
Yellow Time (s)	4.8	4.8
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

# HCM Signalized Intersection Capacity Analysis

## 1: Ferry Exit/Bridge Road & MacArthur Causeway

Future with Project (Weekend) PM
























10/06/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	19	3049	0	0	2948	15	0	0	0	5	0	23
Future Volume (vph)	19	3049	0	0	2948	15	0	0	0	5	0	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8			6.8	6.8				6.8	4.0	
Lane Util. Factor	1.00	0.91			0.91	1.00				1.00	1.00	
Frpb, ped/bikes	1.00	1.00			1.00	0.97				1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00	1.00	
Frt	1.00	1.00			1.00	0.85				1.00	0.86	
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1626	5085			5085	1541				1770	0	
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (perm)	1626	5085			5085	1541				1770	0	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	20	3244	0	0	3136	16	0	0	0	5	0	24
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	0	0	24	0
Lane Group Flow (vph)	20	3244	0	0	3136	14	0	0	0	5	0	0
Confl. Peds. (#/hr)	6		1	1		6						
Confl. Bikes (#/hr)			5			7						
Heavy Vehicles (%)	11%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	5%
Turn Type	Prot	NA			NA	Perm				Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Actuated Green, G (s)	5.2	175.0			163.0	163.0				1.4	0.0	
Effective Green, g (s)	5.2	175.0			163.0	163.0				1.4	0.0	
Actuated g/C Ratio	0.03	0.92			0.86	0.86				0.01	0.00	
Clearance Time (s)		6.8			6.8	6.8				6.8		
Vehicle Extension (s)		1.0			1.0	1.0				3.0		
Lane Grp Cap (vph)	44	4683			4362	1322				13	0	
v/s Ratio Prot	0.01	c0.64			c0.62					c0.00		
v/s Ratio Perm						0.01						
v/c Ratio	0.45	0.69			0.72	0.01				0.38	0.00	
Uniform Delay, d1	91.0	1.6			5.0	1.9				93.9	95.0	
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	
Incremental Delay, d2	5.3	0.9			1.0	0.0				17.9	0.0	
Delay (s)	96.3	2.5			6.1	1.9				111.8	95.0	
Level of Service	F	A			A	A				F	F	
Approach Delay (s)		3.1			6.0			0.0			97.9	
Approach LOS		A			A			A			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			4.9				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			190.0				Sum of lost time (s)			34.0		
Intersection Capacity Utilization			Err%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Future with Project (Weekend) PM

10/06/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (vph)	19	3049	0	0	2948	15	0	0	0	5	0	23
Future Volume (vph)	19	3049	0	0	2948	15	0	0	0	5	0	23
Confl. Peds. (#/hr)	6		1	1		6						
Confl. Bikes (#/hr)			5			7						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	11%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	3244	0	0	3136	16	0	0	0	5	24	0
Turn Type	Prot	NA			NA	Perm				Prot		
Protected Phases	1 3	6			2			7		8		
Permitted Phases						2	7					
Detector Phase	1	6			2	2	7	7		8		
Switch Phase												
Minimum Initial (s)		18.0			18.0	18.0	1.0	1.0		5.0		
Minimum Split (s)		24.8			24.8	24.8	14.0	14.0		20.8		
Total Split (s)		124.0			100.0	100.0	21.0	21.0		21.0		
Total Split (%)		65.3%			52.6%	52.6%	11.1%	11.1%		11.1%		
Yellow Time (s)		4.8			4.8	4.8	4.8	4.8		4.8		
All-Red Time (s)		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		
Total Lost Time (s)		6.8			6.8	6.8		6.8		6.8		
Lead/Lag					Lag	Lag	Lag	Lag				
Lead-Lag Optimize?					Yes	Yes	Yes	Yes				
Recall Mode		C-Max			C-Max	C-Max	None	None		None		
v/c Ratio	0.29	0.65			0.67	0.01				0.09	0.13	
Control Delay	98.9	1.5			4.7	0.0				92.0	0.0	
Queue Delay	0.0	0.0			0.7	0.0				0.0	0.0	
Total Delay	98.9	1.5			5.4	0.0				92.0	0.0	
Queue Length 50th (ft)	25	0			310	0				6	0	
Queue Length 95th (ft)	58	350			689	0				24	0	
Internal Link Dist (ft)		886			389			350			366	
Turn Bay Length (ft)	150					100						
Base Capacity (vph)	147	4974			4653	1415				132	178	
Starvation Cap Reductn	0	0			1037	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	0.65			0.87	0.01				0.04	0.13	

Intersection Summary

Cycle Length: 190

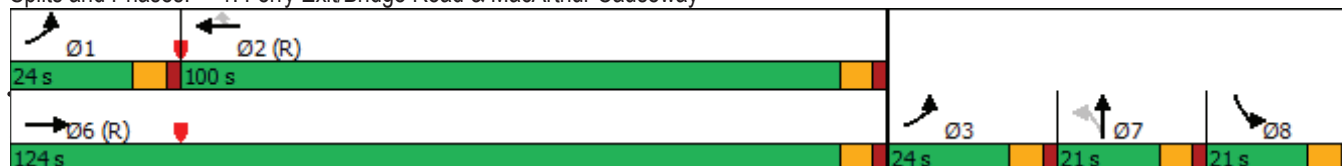
Actuated Cycle Length: 190

Offset: 96 (51%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 1: Ferry Exit/Bridge Road & MacArthur Causeway



Timings  
1: Ferry Exit/Bridge Road & MacArthur Causeway

Future with Project (Weekend) PM

10/06/2021

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	7.0	1.0
Minimum Split (s)	13.8	23.8
Total Split (s)	24.0	24.0
Total Split (%)	13%	13%
Yellow Time (s)	4.8	4.8
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	None	None
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

# HCM Signalized Intersection Capacity Analysis

Future with Project (Weekend) AM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021



Movement	EBT	EBR	WBL2	WBL	NBL	NWL	NWR
Lane Configurations	↑↑↑	↑		↓	↓	↓	
Traffic Volume (vph)	2723	92	57	0	0	67	1
Future Volume (vph)	2723	92	57	0	0	67	1
Ideal Flow (vphpl)	1950	1900	1950	1900	1950	1900	1900
Lane Width	12	12	8	12	12	12	12
Total Lost time (s)	7.3	7.3		6.8		6.0	
Lane Util. Factor	0.91	1.00		1.00		1.00	
Frpb, ped/bikes	1.00	0.97		1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00		1.00	
Frt	1.00	0.85		1.00		1.00	
Flt Protected	1.00	1.00		0.95		0.95	
Satd. Flow (prot)	5219	1483		1626		1722	
Flt Permitted	1.00	1.00		0.95		0.95	
Satd. Flow (perm)	5219	1483		1626		1722	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2866	97	60	0	0	71	1
RTOR Reduction (vph)	0	0	0	0	0	69	0
Lane Group Flow (vph)	2866	97	0	60	0	3	0
Confl. Peds. (#/hr)		2	2	2			
Confl. Bikes (#/hr)		11					1
Heavy Vehicles (%)	2%	6%	11%	2%	2%	5%	2%
Turn Type	NA	Perm	Prot	Prot	Prot	Prot	
Protected Phases	6		5	5	8	3	7
Permitted Phases		6					
Actuated Green, G (s)	114.1	114.1		8.8		7.0	
Effective Green, g (s)	114.1	114.1		8.8		7.0	
Actuated g/C Ratio	0.76	0.76		0.06		0.05	
Clearance Time (s)	7.3	7.3		6.8			
Vehicle Extension (s)	1.0	1.0		2.0			
Lane Grp Cap (vph)	3969	1128		95		80	
v/s Ratio Prot	c0.55			c0.04		c0.00	
v/s Ratio Perm		0.07					
v/c Ratio	0.72	0.09		0.63		0.04	
Uniform Delay, d1	9.5	4.6		69.0		68.3	
Progression Factor	1.00	1.00		1.00		1.00	
Incremental Delay, d2	1.2	0.2		9.6		0.2	
Delay (s)	10.7	4.7		78.7		68.5	
Level of Service	B	A		E		E	
Approach Delay (s)	10.5				0.0	68.5	
Approach LOS	B				A	E	
<b>Intersection Summary</b>							
HCM 2000 Control Delay			13.2		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.75				
Actuated Cycle Length (s)			150.0		Sum of lost time (s)		32.1
Intersection Capacity Utilization			66.1%		ICU Level of Service		C
Analysis Period (min)			15				

c Critical Lane Group

# Timings

Future with Project (Weekend) AM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021



Lane Group	EBT	EBR	WBL2	WBL	NBL	NWL	NWR	Ø2	Ø3	Ø7
Lane Configurations	↑↑↑	↑		↓	↓	↓				
Traffic Volume (vph)	2723	92	57	0	0	67	1			
Future Volume (vph)	2723	92	57	0	0	67	1			
Confl. Peds. (#/hr)		2	2	2						
Confl. Bikes (#/hr)		11					1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Heavy Vehicles (%)	2%	6%	11%	2%	2%	5%	2%			
Shared Lane Traffic (%)										
Lane Group Flow (vph)	2866	97	0	60	0	72	0			
Turn Type	NA	Perm	Prot	Prot	Prot	Prot				
Protected Phases	6		5	5	8	3 7		2	3	7
Permitted Phases		6								
Detector Phase	6	6	5	5	8	7				
Switch Phase										
Minimum Initial (s)	20.0	20.0	5.0	5.0	10.0			20.0	1.0	7.0
Minimum Split (s)	27.3	27.3	12.3	12.3	16.0			27.3	29.0	13.0
Total Split (s)	57.0	57.0	19.0	19.0	32.0			121.0	29.0	13.0
Total Split (%)	38.0%	38.0%	12.7%	12.7%	21.3%			81%	19%	9%
Yellow Time (s)	4.8	4.8	4.8	4.8	4.0			4.8	4.0	4.0
All-Red Time (s)	2.5	2.5	2.0	2.0	2.0			2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0					
Total Lost Time (s)	7.3	7.3		6.8	6.0					
Lead/Lag	Lead	Lead	Lag	Lag	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	C-Max	C-Max	None	None	None			C-Max	None	None
v/c Ratio	0.71	0.09		0.56		0.36				
Control Delay	11.0	5.4		86.6		5.3				
Queue Delay	0.0	0.0		0.0		0.0				
Total Delay	11.0	5.4		86.6		5.3				
Queue Length 50th (ft)	501	22		58		0				
Queue Length 95th (ft)	621	44		106		2				
Internal Link Dist (ft)	231				430	189				
Turn Bay Length (ft)		175								
Base Capacity (vph)	4016	1131		137		198				
Starvation Cap Reductn	0	0		0		0				
Spillback Cap Reductn	0	0		0		0				
Storage Cap Reductn	0	0		0		0				
Reduced v/c Ratio	0.71	0.09		0.44		0.36				

### Intersection Summary

Cycle Length: 150

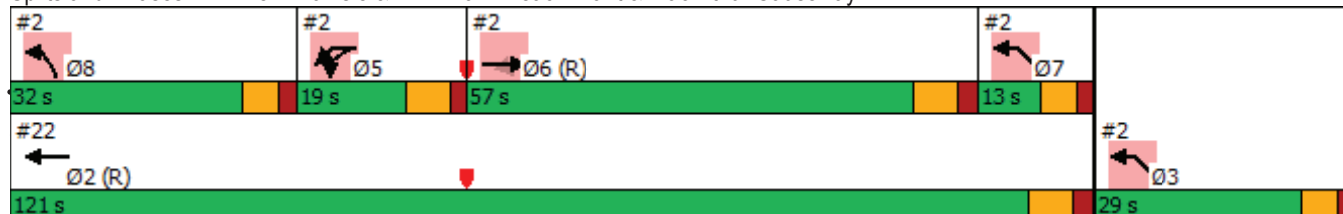
Actuated Cycle Length: 150

Offset: 81 (54%), Referenced to phase 6:EBT and 2:, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway





# HCM Signalized Intersection Capacity Analysis

Future with Project (Weekend) PM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021



Movement	EBT	EBR	WBL2	WBL	NBL	NWL	NWR
Lane Configurations	↑↑↑	↑		↓	↓	↓	
Traffic Volume (vph)	2965	92	51	0	0	114	1
Future Volume (vph)	2965	92	51	0	0	114	1
Ideal Flow (vphpl)	1950	1900	1950	1900	1950	1900	1900
Lane Width	12	12	8	12	12	12	12
Total Lost time (s)	7.3	7.3		6.8		6.0	
Lane Util. Factor	0.91	1.00		1.00		1.00	
Frpb, ped/bikes	1.00	0.98		1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00		1.00	
Frt	1.00	0.85		1.00		1.00	
Flt Protected	1.00	1.00		0.95		0.95	
Satd. Flow (prot)	5219	1547		1752		1773	
Flt Permitted	1.00	1.00		0.95		0.95	
Satd. Flow (perm)	5219	1547		1752		1773	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3121	97	54	0	0	120	1
RTOR Reduction (vph)	0	0	0	0	0	115	0
Lane Group Flow (vph)	3121	97	0	54	0	6	0
Confl. Peds. (#/hr)		2	2	2			
Confl. Bikes (#/hr)		4					
Heavy Vehicles (%)	2%	2%	3%	2%	2%	2%	2%
Turn Type	NA	Perm	Prot	Prot	Prot	Prot	
Protected Phases	6		5	5	8	3	7
Permitted Phases		6					
Actuated Green, G (s)	114.9	114.9		8.0		7.0	
Effective Green, g (s)	114.9	114.9		8.0		7.0	
Actuated g/C Ratio	0.77	0.77		0.05		0.05	
Clearance Time (s)	7.3	7.3		6.8			
Vehicle Extension (s)	1.0	1.0		2.0			
Lane Grp Cap (vph)	3997	1185		93		82	
v/s Ratio Prot	c0.60			c0.03		c0.00	
v/s Ratio Perm		0.06					
v/c Ratio	0.78	0.08		0.58		0.07	
Uniform Delay, d1	10.2	4.4		69.4		68.4	
Progression Factor	1.00	1.00		1.00		1.00	
Incremental Delay, d2	1.6	0.1		5.8		0.4	
Delay (s)	11.8	4.5		75.2		68.7	
Level of Service	B	A		E		E	
Approach Delay (s)	11.6				0.0	68.7	
Approach LOS	B				A	E	
<b>Intersection Summary</b>							
HCM 2000 Control Delay			14.6		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.80				
Actuated Cycle Length (s)			150.0		Sum of lost time (s)		32.1
Intersection Capacity Utilization			73.3%		ICU Level of Service		D
Analysis Period (min)			15				

c Critical Lane Group

# Timings

Future with Project (Weekend) PM

## 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway

10/11/2021



Lane Group	EBT	EBR	WBL2	WBL	NBL	NWL	NWR	Ø2	Ø3	Ø7
Lane Configurations	↑↑↑	↑		↓	↓	↓				
Traffic Volume (vph)	2965	92	51	0	0	114	1			
Future Volume (vph)	2965	92	51	0	0	114	1			
Confl. Peds. (#/hr)		2	2	2						
Confl. Bikes (#/hr)		4								
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Heavy Vehicles (%)	2%	2%	3%	2%	2%	2%	2%			
Shared Lane Traffic (%)										
Lane Group Flow (vph)	3121	97	0	54	0	121	0			
Turn Type	NA	Perm	Prot	Prot	Prot	Prot				
Protected Phases	6		5	5	8	3 7		2	3	7
Permitted Phases		6								
Detector Phase	6	6	5	5	8	7				
Switch Phase										
Minimum Initial (s)	20.0	20.0	5.0	5.0	10.0			20.0	1.0	7.0
Minimum Split (s)	27.3	27.3	12.3	12.3	16.0			27.3	29.0	13.0
Total Split (s)	57.0	57.0	19.0	19.0	32.0			121.0	29.0	13.0
Total Split (%)	38.0%	38.0%	12.7%	12.7%	21.3%			81%	19%	9%
Yellow Time (s)	4.8	4.8	4.8	4.8	4.0			4.8	4.0	4.0
All-Red Time (s)	2.5	2.5	2.0	2.0	2.0			2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0					
Total Lost Time (s)	7.3	7.3		6.8	6.0					
Lead/Lag	Lead	Lead	Lag	Lag	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	C-Max	C-Max	None	None	None			C-Max	None	None
v/c Ratio	0.77	0.08		0.51		0.60				
Control Delay	12.1	5.0		84.6		23.5				
Queue Delay	0.0	0.0		0.0		0.0				
Total Delay	12.1	5.0		84.6		23.5				
Queue Length 50th (ft)	594	22		52		0				
Queue Length 95th (ft)	724	42		99		64				
Internal Link Dist (ft)	231				430	189				
Turn Bay Length (ft)		175								
Base Capacity (vph)	4045	1193		144		200				
Starvation Cap Reductn	0	0		0		0				
Spillback Cap Reductn	0	0		0		0				
Storage Cap Reductn	0	0		0		0				
Reduced v/c Ratio	0.77	0.08		0.38		0.61				

### Intersection Summary

Cycle Length: 150

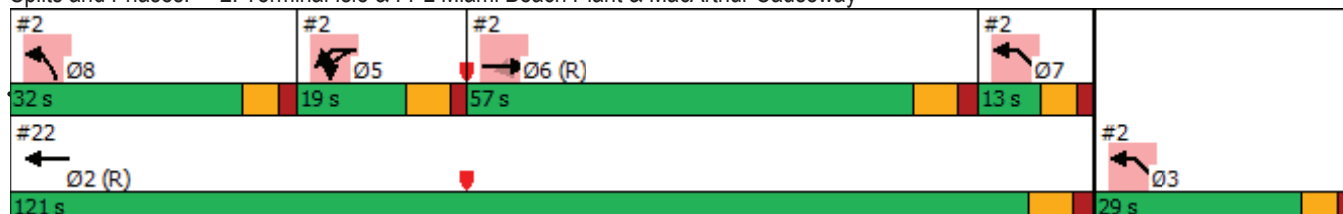
Actuated Cycle Length: 150

Offset: 81 (54%), Referenced to phase 6:EBT and 2:, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 2: Terminal Isle & FPL Miami Beach Plant & MacArthur Causeway















# HCM Signalized Intersection Capacity Analysis

## 3: Alton Road & 5th Street

Future with Project (Weekend) AM













10/12/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑↑	↑
Traffic Volume (vph)	4	1081	647	34	987	134	277	148	41	61	173	524
Future Volume (vph)	4	1081	647	34	987	134	277	148	41	61	173	524
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.91	1.00	1.00	0.99	1.00	0.96			1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97			1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (prot)		3530	1443	1556	3539	1530	3400	1704			1839	1527
Flt Permitted		0.95	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (perm)		3359	1443	1556	3539	1530	3400	1704			1839	1527
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	1138	681	36	1039	141	292	156	43	64	182	552
RTOR Reduction (vph)	0	0	239	0	0	55	0	6	0	0	0	0
Lane Group Flow (vph)	0	1142	442	36	1039	86	292	193	0	0	246	552
Confl. Peds. (#/hr)			46	46			2		58	58		2
Confl. Bikes (#/hr)			5			8			9			19
Heavy Vehicles (%)	75%	2%	2%	16%	2%	4%	3%	4%	2%	2%	2%	4%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Actuated Green, G (s)		85.0	85.0	6.9	97.9	97.9	19.6	19.6			24.5	160.0
Effective Green, g (s)		85.0	85.0	6.9	97.9	97.9	19.6	19.6			24.5	160.0
Actuated g/C Ratio		0.53	0.53	0.04	0.61	0.61	0.12	0.12			0.15	1.00
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	1.0	3.0	3.0			3.5	
Lane Grp Cap (vph)		1784	766	67	2165	936	416	208			281	1527
v/s Ratio Prot				0.02	c0.29		0.09	c0.11			c0.13	
v/s Ratio Perm		c0.34	0.31			0.06						0.36
v/c Ratio		0.64	0.58	0.54	0.48	0.09	0.70	0.93			0.88	0.36
Uniform Delay, d1		26.6	25.3	75.0	17.1	12.8	67.4	69.5			66.3	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2		1.8	3.2	4.1	0.8	0.2	5.3	42.1			25.2	0.7
Delay (s)		28.4	28.5	79.1	17.8	13.0	72.7	111.6			91.5	0.7
Level of Service		C	C	E	B	B	E	F			F	A
Approach Delay (s)		28.4			19.1			88.4			28.7	
Approach LOS		C			B			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			32.7									
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			160.0									
Intersection Capacity Utilization			99.1%									
Analysis Period (min)			15									
c Critical Lane Group												

Timings  
3: Alton Road & 5th Street

Future with Project (Weekend) AM

10/12/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑↑	↑
Traffic Volume (vph)	4	1081	647	34	987	134	277	148	41	61	173	524
Future Volume (vph)	4	1081	647	34	987	134	277	148	41	61	173	524
Confl. Peds. (#/hr)			46	46			2		58	58		2
Confl. Bikes (#/hr)			5			8			9			19
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
Heavy Vehicles (%)	75%	2%	2%	16%	2%	4%	3%	4%	2%	2%	2%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1142	681	36	1039	141	292	199	0	0	246	552
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Detector Phase	2	2	2	1	6	6	3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	35.0	35.0	35.0	11.0	13.0	13.0	23.0	23.0		31.0	31.0	
Total Split (s)	86.0	86.0	86.0	16.0	102.0	102.0	26.0	26.0		32.0	32.0	
Total Split (%)	53.8%	53.8%	53.8%	10.0%	63.8%	63.8%	16.3%	16.3%		20.0%	20.0%	
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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
v/c Ratio		0.63	0.67	0.47	0.48	0.14	0.70	0.93			0.88	0.36
Control Delay		29.0	10.2	93.3	18.3	2.2	77.1	110.4			95.5	0.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay		29.0	10.2	93.3	18.3	2.2	77.1	110.4			95.5	0.7
Queue Length 50th (ft)		455	122	37	311	0	153	202			252	0
Queue Length 95th (ft)		548	283	79	366	30	207	#360			#394	0
Internal Link Dist (ft)		300			275			278			324	
Turn Bay Length (ft)			225	125								
Base Capacity (vph)		1811	1013	97	2165	991	425	219			298	1527
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		0.63	0.67	0.37	0.48	0.14	0.69	0.91			0.83	0.36
<b>Intersection Summary</b>												
Cycle Length: 160												
Actuated Cycle Length: 160												
Offset: 55 (34%), Referenced to phase 2:EBTL and 6:WBT, Start of Green												
Natural Cycle: 100												
Control Type: Actuated-Coordinated												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												

Timings  
3: Alton Road & 5th Street

Future with Project (Weekend) AM

10/12/2021

Splits and Phases: 3: Alton Road & 5th Street















# HCM Signalized Intersection Capacity Analysis

## 3: Alton Road & 5th Street

Future with Project (Weekend) PM













10/12/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑↑	↑
Traffic Volume (vph)	4	1216	601	34	1393	151	430	171	36	54	212	752
Future Volume (vph)	4	1216	601	34	1393	151	430	171	36	54	212	752
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95	1.00	0.97	1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.93	1.00	1.00	0.98	1.00	0.98			1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97			1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (prot)		3531	1477	1556	3539	1557	3433	1756			1844	1560
Flt Permitted		0.95	1.00	0.95	1.00	1.00	0.95	1.00			0.99	1.00
Satd. Flow (perm)		3354	1477	1556	3539	1557	3433	1756			1844	1560
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)	4	1254	620	35	1436	156	443	176	37	56	219	775
RTOR Reduction (vph)	0	0	201	0	0	51	0	4	0	0	0	0
Lane Group Flow (vph)	0	1258	419	35	1436	105	443	209	0	0	275	775
Confl. Peds. (#/hr)			31	31			2		42	42		2
Confl. Bikes (#/hr)			12			13			9			11
Heavy Vehicles (%)	75%	2%	2%	16%	2%	2%	2%	3%	2%	2%	2%	2%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Actuated Green, G (s)		83.6	83.6	6.8	96.4	96.4	20.0	20.0			25.6	160.0
Effective Green, g (s)		83.6	83.6	6.8	96.4	96.4	20.0	20.0			25.6	160.0
Actuated g/C Ratio		0.52	0.52	0.04	0.60	0.60	0.12	0.12			0.16	1.00
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)		1.0	1.0	2.0	1.0	1.0	3.0	3.0			3.5	
Lane Grp Cap (vph)		1752	771	66	2132	938	429	219			295	1560
v/s Ratio Prot				0.02	c0.41		c0.13	0.12			c0.15	
v/s Ratio Perm		c0.38	0.28			0.07						0.50
v/c Ratio		0.72	0.54	0.53	0.67	0.11	1.03	0.95			0.93	0.50
Uniform Delay, d1		29.2	25.5	75.0	21.3	13.6	70.0	69.5			66.3	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2		2.6	2.7	4.0	1.7	0.2	52.1	47.3			35.2	1.1
Delay (s)		31.8	28.2	79.1	23.0	13.8	122.1	116.8			101.5	1.1
Level of Service		C	C	E	C	B	F	F			F	A
Approach Delay (s)		30.6			23.3			120.4			27.4	
Approach LOS		C			C			F			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			39.0									
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			160.0									
Intersection Capacity Utilization			108.1%									
Analysis Period (min)			15									
c Critical Lane Group												

Timings  
3: Alton Road & 5th Street

Future with Project (Weekend) PM

10/12/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑	↑	↑↑	↑			↑↑	↑
Traffic Volume (vph)	4	1216	601	34	1393	151	430	171	36	54	212	752
Future Volume (vph)	4	1216	601	34	1393	151	430	171	36	54	212	752
Confl. Peds. (#/hr)			31	31			2		42	42		2
Confl. Bikes (#/hr)			12			13			9			11
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
Heavy Vehicles (%)	75%	2%	2%	16%	2%	2%	2%	3%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1258	620	35	1436	156	443	213	0	0	275	775
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Free
Protected Phases		2		1	6		3	3		4	4	
Permitted Phases	2		2			6						Free
Detector Phase	2	2	2	1	6	6	3	3		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	35.0	35.0	35.0	11.0	13.0	13.0	23.0	23.0		31.0	31.0	
Total Split (s)	86.0	86.0	86.0	16.0	102.0	102.0	26.0	26.0		32.0	32.0	
Total Split (%)	53.8%	53.8%	53.8%	10.0%	63.8%	63.8%	16.3%	16.3%		20.0%	20.0%	
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	
Total Lost Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
v/c Ratio		0.71	0.63	0.47	0.67	0.16	1.03	0.96			0.94	0.50
Control Delay		32.0	11.3	92.8	23.3	3.7	118.4	116.1			103.7	1.1
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay		32.0	11.3	92.8	23.3	3.7	118.4	116.1			103.7	1.1
Queue Length 50th (ft)		529	142	36	512	12	~255	220			287	0
Queue Length 95th (ft)		635	284	77	590	43	#370	#392			#464	0
Internal Link Dist (ft)		300			275			278			324	
Turn Bay Length (ft)			225	125								
Base Capacity (vph)		1778	981	97	2133	989	429	223			299	1560
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		0.71	0.63	0.36	0.67	0.16	1.03	0.96			0.92	0.50

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 55 (34%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 110

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.

Timings  
3: Alton Road & 5th Street

Future with Project (Weekend) PM

10/12/2021

Splits and Phases: 3: Alton Road & 5th Street








HCM 6th TWSC  
4: Project Driveway & Terminal Isle

Future with Project (Weekend) AM

10/06/2021

Intersection						
Int Delay, s/veh	2.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	42	56	0	38	40	0
Future Vol, veh/h	42	56	0	38	40	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	59	0	40	42	0
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	103	0	114	74
Stage 1	-	-	-	-	74	-
Stage 2	-	-	-	-	40	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1489	-	882	988
Stage 1	-	-	-	-	949	-
Stage 2	-	-	-	-	982	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1489	-	882	988
Mov Cap-2 Maneuver	-	-	-	-	882	-
Stage 1	-	-	-	-	949	-
Stage 2	-	-	-	-	982	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		9.3		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	882	-	-	1489	-	
HCM Lane V/C Ratio	0.048	-	-	-	-	
HCM Control Delay (s)	9.3	-	-	0	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	




HCM 6th TWSC  
4: Project Driveway & Terminal Isle

Future with Project (Weekend) PM

10/06/2021

Intersection

Int Delay, s/veh 1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	89	56	0	32	40	0
Future Vol, veh/h	89	56	0	32	40	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	94	59	0	34	42	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	153
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1428
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1428
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	833	-	-	1428	-
HCM Lane V/C Ratio	0.051	-	-	-	-
HCM Control Delay (s)	9.6	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑			↑		↗
Traffic Vol, veh/h	2723	0	0	57	0	44
Future Vol, veh/h	2723	0	0	57	0	44
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	11
Mvmt Flow	2866	0	0	60	0	46
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	-	1434
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	4.0045
Pot Cap-1 Maneuver	-	0	0	-	0	141
Stage 1	-	0	0	-	0	-
Stage 2	-	0	0	-	0	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	-	141
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		42.5	
HCM LOS					E	
Minor Lane/Major Mvmt	NBLn1	EBT	WBT			
Capacity (veh/h)	141	-	-			
HCM Lane V/C Ratio	0.328	-	-			
HCM Control Delay (s)	42.5	-	-			
HCM Lane LOS	E	-	-			
HCM 95th %tile Q(veh)	1.3	-	-			

**Intersection**

Int Delay, s/veh 0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑		↗
Traffic Vol, veh/h	2979	0	0	51	0	46
Future Vol, veh/h	2979	0	0	51	0	46
Conflicting Peds, #/hr	0	3	3	0	3	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	7
Mvmt Flow	3136	0	0	54	0	48

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	-	- 1571
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	- 6.4
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	- 3.9665
Pot Cap-1 Maneuver	-	0	0 - 117
Stage 1	-	0	0 -
Stage 2	-	0	0 -
Platoon blocked, %	-		-
Mov Cap-1 Maneuver	-	-	- 117
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	56
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	117	-	-
HCM Lane V/C Ratio	0.414	-	-
HCM Control Delay (s)	56	-	-
HCM Lane LOS	F	-	-
HCM 95th %tile Q(veh)	1.8	-	-

# **Appendix E**

## **Committed Roadway Development Documentation**

**Project Type:** Expressway  
**MPO Project No.:** DT2511563  
**Type of Work:** NEW ROAD CONSTRUCTION  
**TIP Year:** 2021  
**Construction Year:** 2021  
**From:** FROM PORT OF MIAMI  
**To:** TO SR 836/I-395  
**Agency:** FL Dept. of Transportation  
**Management Agency:** FDOT  
**Agency Project No:** 2511563  
**Status:**  
**Contact Person:**  
**Contact Email:**  
**Contact Phone:**  
**Description:**

### Funding Information \$(thousands)

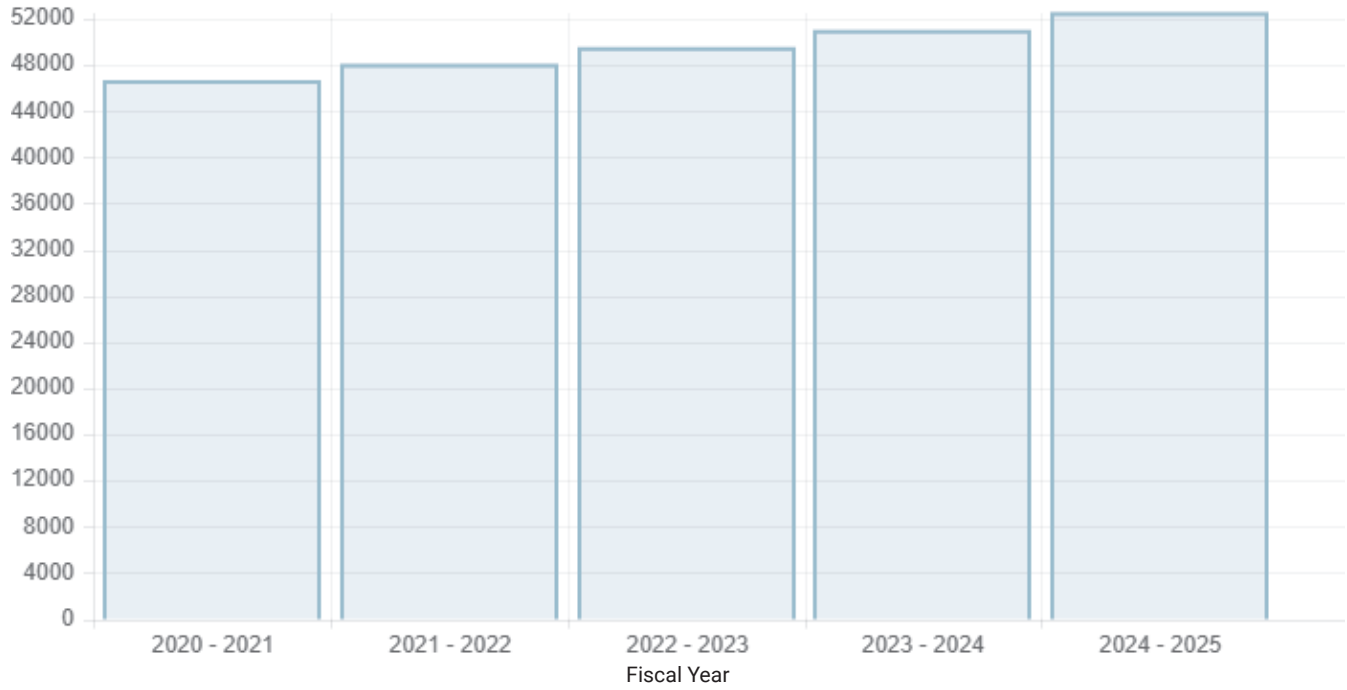
Project Phase	Funding	2020 - 2021	2021 - 2022	2022 - 2023	2023 - 2024	2024 - 2025
DESIGN/ BUILD	DC	\$0	\$0	\$0	\$0	\$0
DESIGN/ BUILD	DIH	\$0	\$0	\$0	\$0	\$0
DESIGN/ BUILD	DIS	\$0	\$0	\$0	\$0	\$0
DESIGN/ BUILD	DS	\$0	\$0	\$0	\$0	\$0
DESIGN/ BUILD	GMR	\$24,338	\$25,357	\$24,712	\$24,508	\$26,018
DESIGN/ BUILD	GMR	\$0	\$0	\$0	\$0	\$0
DESIGN/ BUILD	HPP	\$0	\$0	\$0	\$0	\$0
DESIGN/ BUILD	LF	\$2,935	\$3,023	\$3,113	\$3,207	\$3,303

## PORT OF MIAMI TUNNEL

### 2021 Transportation Improvement Program

Project Phase	Funding	2020 - 2021	2021 - 2022	2022 - 2023	2023 - 2024	2024 - 2025
DESIGN/ BUILD	LF	\$0	\$0	\$0	\$0	\$0
DESIGN/ BUILD	NHAC	\$0	\$0	\$0	\$0	\$0
DESIGN/ BUILD	NHPP	\$0	\$0	\$0	\$0	\$0
OPERATIONS	DI	\$0	\$19,729	\$21,726	\$23,323	\$23,248
OPERATIONS	STED	\$19,435	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	DI	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	DIH	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	DIS	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	DS	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	FD21	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	GMR	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	GMR	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	LF	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	NHAC	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	NHPP	\$0	\$0	\$0	\$0	\$0
RIGHT OF WAY	DIH	\$0	\$0	\$0	\$0	\$0
RIGHT OF WAY	DS	\$0	\$0	\$0	\$0	\$0
RIGHT OF WAY	LF	\$0	\$0	\$0	\$0	\$0

Funding Chart \$(thousands)





## Project Photos



**Project Type:** Expressway  
**MPO Project No.:** DT2516881  
**Type of Work:** BRIDGE-REPLACE AND ADD LANES  
**TIP Year:** 2021  
**Construction Year:** 2021  
**From:** FROM WEST OF I-95  
**To:** TO MACARTHUR CAUSEWAY BRIDGE  
**Agency:** FL Dept. of Transportation  
**Management Agency:** FDOT  
**Agency Project No:** 2516881  
**Status:**  
**Contact Person:**  
**Contact Email:**  
**Contact Phone:**  
**Description:**

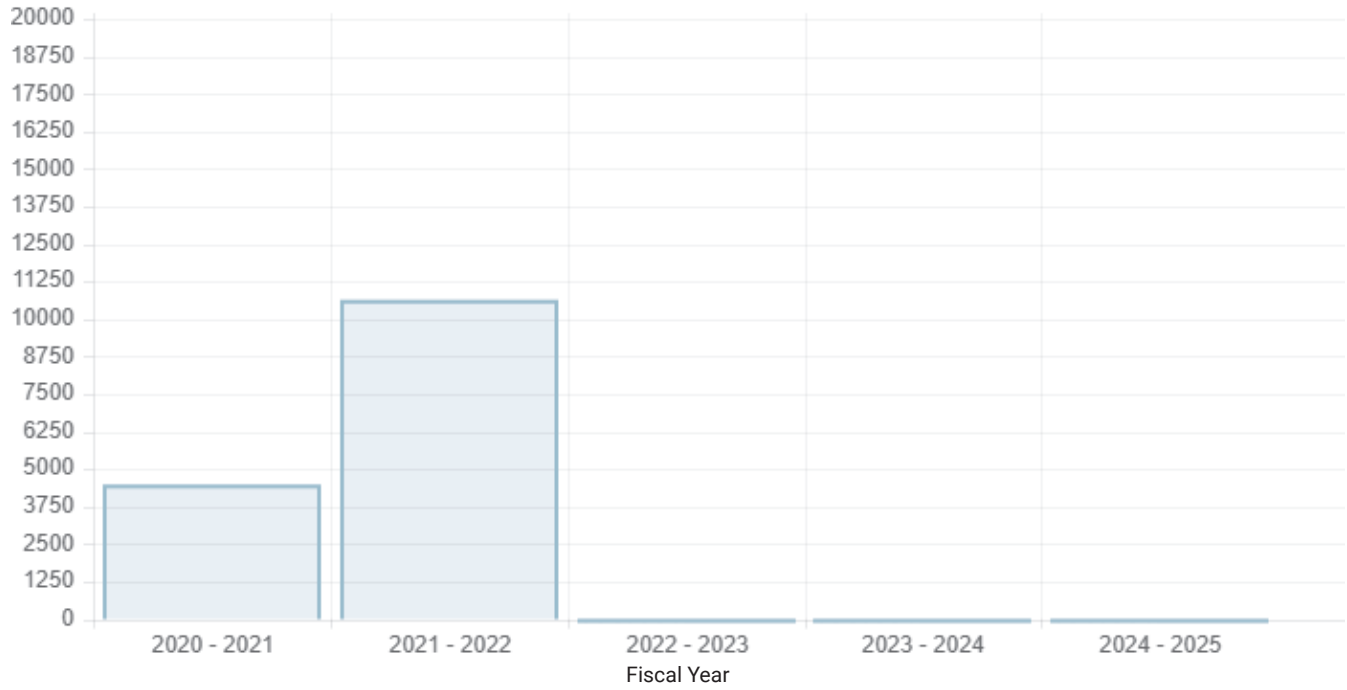
**Funding Information \$(thousands)**

Project Phase	Funding	2020 - 2021	2021 - 2022	2022 - 2023	2023 - 2024	2024 - 2025
DESIGN/ BUILD	ACID	\$92	\$0	\$0	\$0	\$0
DESIGN/ BUILD	ACNP	\$0	\$3,891	\$0	\$0	\$0
DESIGN/ BUILD	ACNP	\$513	\$0	\$0	\$0	\$0
DESIGN/ BUILD	ACSU	\$3,872	\$0	\$0	\$0	\$0
DESIGN/ BUILD	BRRP	\$0	\$0	\$0	\$0	\$0
DESIGN/ BUILD	DDR	\$0	\$6,109	\$0	\$0	\$0
DESIGN/ BUILD	DI	\$0	\$0	\$0	\$0	\$0
DESIGN/ BUILD	DI	\$0	\$0	\$0	\$0	\$0

Project Phase	Funding	2020 - 2021	2021 - 2022	2022 - 2023	2023 - 2024	2024 - 2025
DESIGN/ BUILD	DS	\$0	\$0	\$0	\$0	\$0
DESIGN/ BUILD	GMR	\$0	\$0	\$0	\$0	\$0
DESIGN/ BUILD	LF	\$0	\$0	\$0	\$0	\$0
DESIGN/ BUILD	NHEX	\$0	\$0	\$0	\$0	\$0
DESIGN/ BUILD	NHPP	\$0	\$0	\$0	\$0	\$0
DESIGN/ BUILD	SA	\$0	\$638	\$0	\$0	\$0
DESIGN/ BUILD	STED	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	DDR	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	DI	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	DI	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	DIH	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	DIS	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	DS	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	GMR	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	NHPP	\$0	\$0	\$0	\$0	\$0
RIGHT OF WAY	BNCA	\$0	\$0	\$0	\$0	\$0
RIGHT OF WAY	BNDS	\$0	\$0	\$0	\$0	\$0
RIGHT OF WAY	BNIR	\$0	\$0	\$0	\$0	\$0
RIGHT OF WAY	DDR	\$0	\$0	\$0	\$0	\$0
RIGHT OF WAY	DI	\$0	\$0	\$0	\$0	\$0
RIGHT OF WAY	DIH	\$0	\$0	\$0	\$0	\$0
RIGHT OF WAY	DIS	\$0	\$0	\$0	\$0	\$0

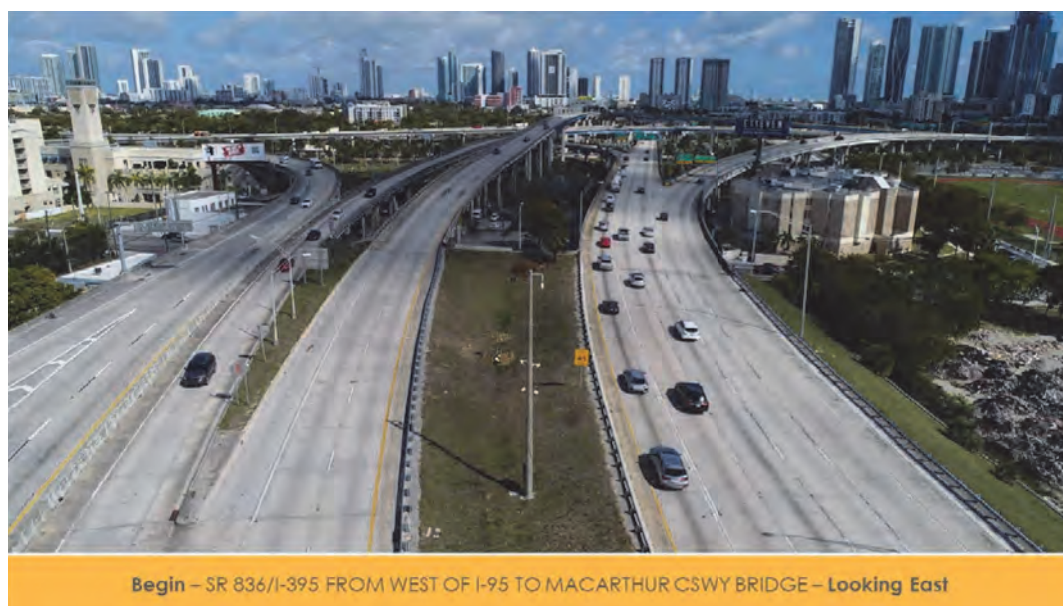
Project Phase	Funding	2020 - 2021	2021 - 2022	2022 - 2023	2023 - 2024	2024 - 2025
WAY						
RIGHT OF WAY	DS	\$0	\$0	\$0	\$0	\$0
RIGHT OF WAY	GMR	\$0	\$0	\$0	\$0	\$0
RIGHT OF WAY	SIWR	\$0	\$0	\$0	\$0	\$0
RAILROAD & UTILITIES	DDR	\$0	\$0	\$0	\$0	\$0
RAILROAD & UTILITIES	DI	\$0	\$0	\$0	\$0	\$0
RAILROAD & UTILITIES	DS	\$0	\$0	\$0	\$0	\$0
RAILROAD & UTILITIES	LF	\$0	\$0	\$0	\$0	\$0

Funding Chart \$(thousands)





## Project Photos





Begin – SR 836/I-395 FROM WEST OF I-95 TO MACARTHUR CSWY BRIDGE – Looking West



End – SR 836/I-395 FROM WEST OF I-95 TO MACARTHUR CSWY BRIDGE – Looking East





End – SR 836/I-395 FROM WEST OF I-95 TO MACARTHUR CSWY BRIDGE – Looking West

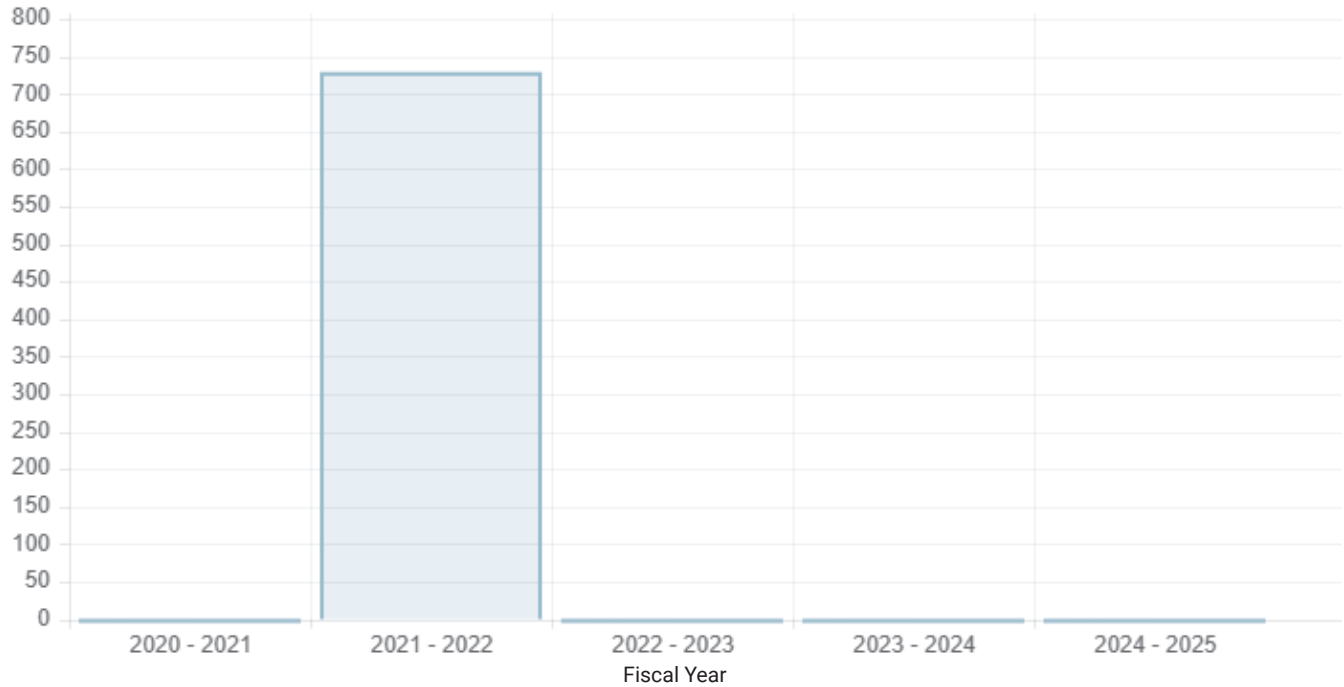


**Project Type:** Pedestrian/Bicycle  
**MPO Project No.:** DT4434321  
**Type of Work:** BIKE PATH/TRAIL  
**TIP Year:** 2021  
**Construction Year:** 2022  
**From:** FROM SR 5/BISCAYNE BLV  
**To:** TO SR 907/ALTON RD  
**Agency:** FL Dept. of Transportation  
**Management Agency:** FDOT  
**Agency Project No:** 4434321  
**Status:**  
**Contact Person:**  
**Contact Email:**  
**Contact Phone:**  
**Description:**

## Funding Information \$(thousands)

Project Phase	Funding	2020 - 2021	2021 - 2022	2022 - 2023	2023 - 2024	2024 - 2025
CONSTRUCTION	DDR	\$0	\$672	\$0	\$0	\$0
CONSTRUCTION	DIH	\$0	\$57	\$0	\$0	\$0
PRELIMINARY ENGINEERING	DIH	\$0	\$0	\$0	\$0	\$0
PRELIMINARY ENGINEERING	DS	\$0	\$0	\$0	\$0	\$0

Funding Chart \$(thousands)



# DTPW - SMART PLAN CORRIDORS T.R.I.P. CAPITAL EXPENDITURES

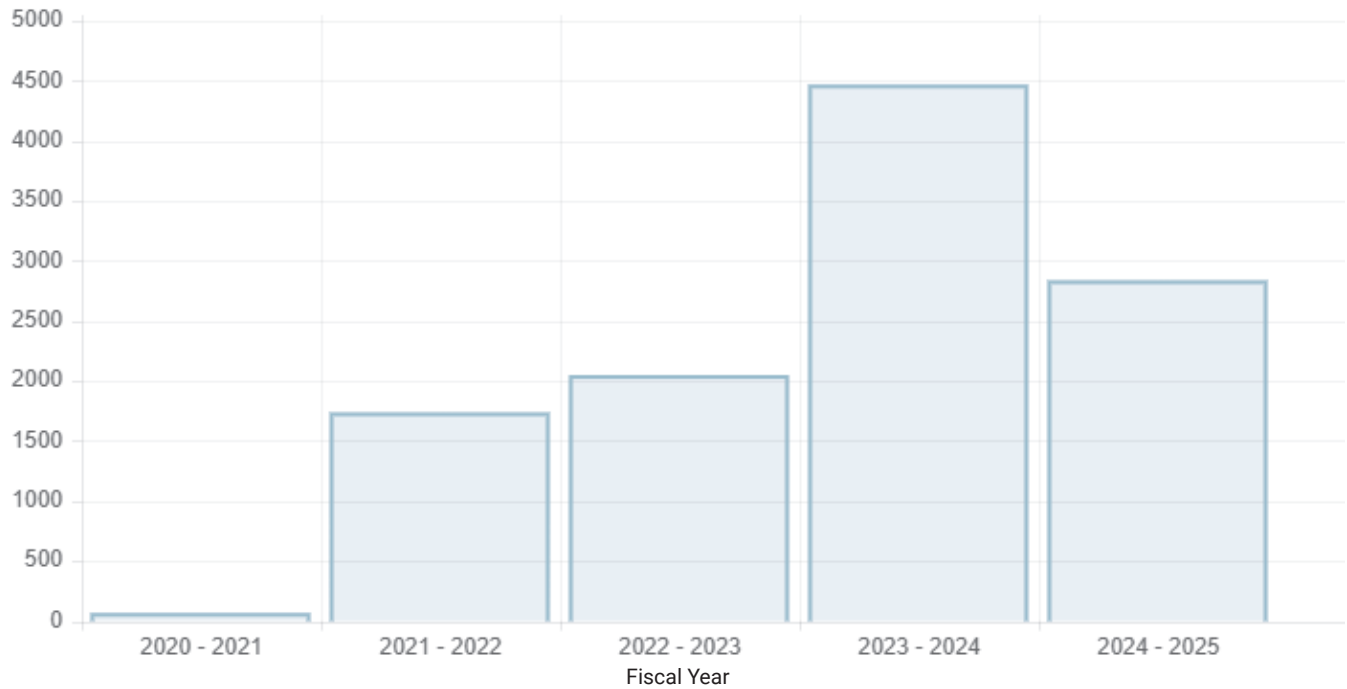
2021 Transportation Improvement Program

**Project Type:** Transit  
**MPO Project No.:** TA000109  
**Type of Work:** TRANSIT IMPROVEMENT  
**TIP Year:** 2021  
**Construction Year:**  
**From:**  
**To:**  
**Agency:** Miami-Dade Dept. of Transportation and Public Works (Transit)  
**Management Agency:** Miami-Dade Dept. of Transportation and Public Works (Transit)  
**Agency Project No:** 000109  
**Status:**  
**Contact Person:**  
**Contact Email:**  
**Contact Phone:**  
**Description:**

## Funding Information \$(thousands)

Project Phase	Funding	2020 - 2021	2021 - 2022	2022 - 2023	2023 - 2024	2024 - 2025
CAPITAL	LF	\$0	\$0	\$0	\$0	\$0
CAPITAL	TRIP	\$34	\$903	\$2,048	\$2,271	\$2,837
CAPITAL	TRWR	\$34	\$834	\$0	\$2,200	\$0

Funding Chart \$(thousands)

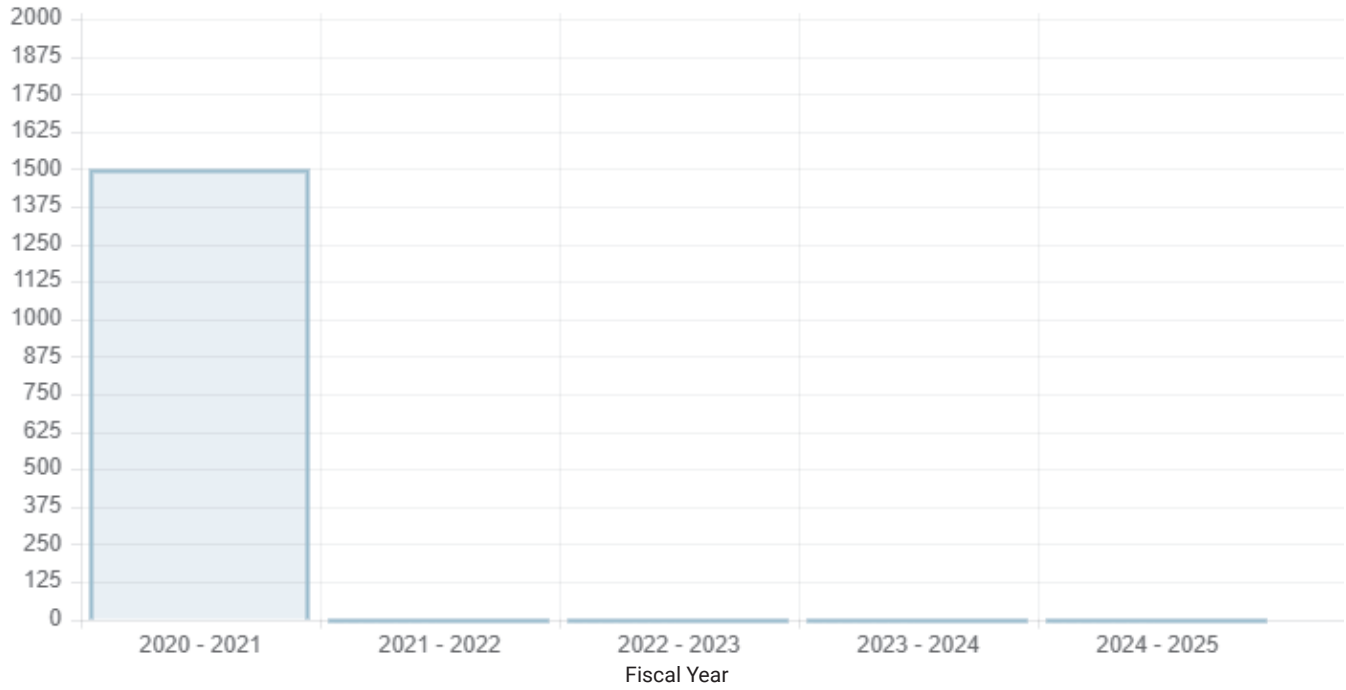


**Project Type:** Transit  
**MPO Project No.:** TA4389421  
**Type of Work:** URBAN CORRIDOR IMPROVEMENTS  
**TIP Year:** 2021  
**Construction Year:**  
**From:**  
**To:**  
**Agency:** FL Dept. of Transportation  
**Management Agency:** FDOT  
**Agency Project No:** 4389421  
**Status:**  
**Contact Person:**  
**Contact Email:**  
**Contact Phone:**  
**Description:**

## Funding Information \$(thousands)

Project Phase	Funding	2020 - 2021	2021 - 2022	2022 - 2023	2023 - 2024	2024 - 2025
OPERATIONS	DPTO	\$750	\$0	\$0	\$0	\$0
OPERATIONS	LF	\$750	\$0	\$0	\$0	\$0

Funding Chart \$(thousands)





# CITY OF MIAMI BEACH - SOUTH BEACH TROLLEY SERVICE ROUTE

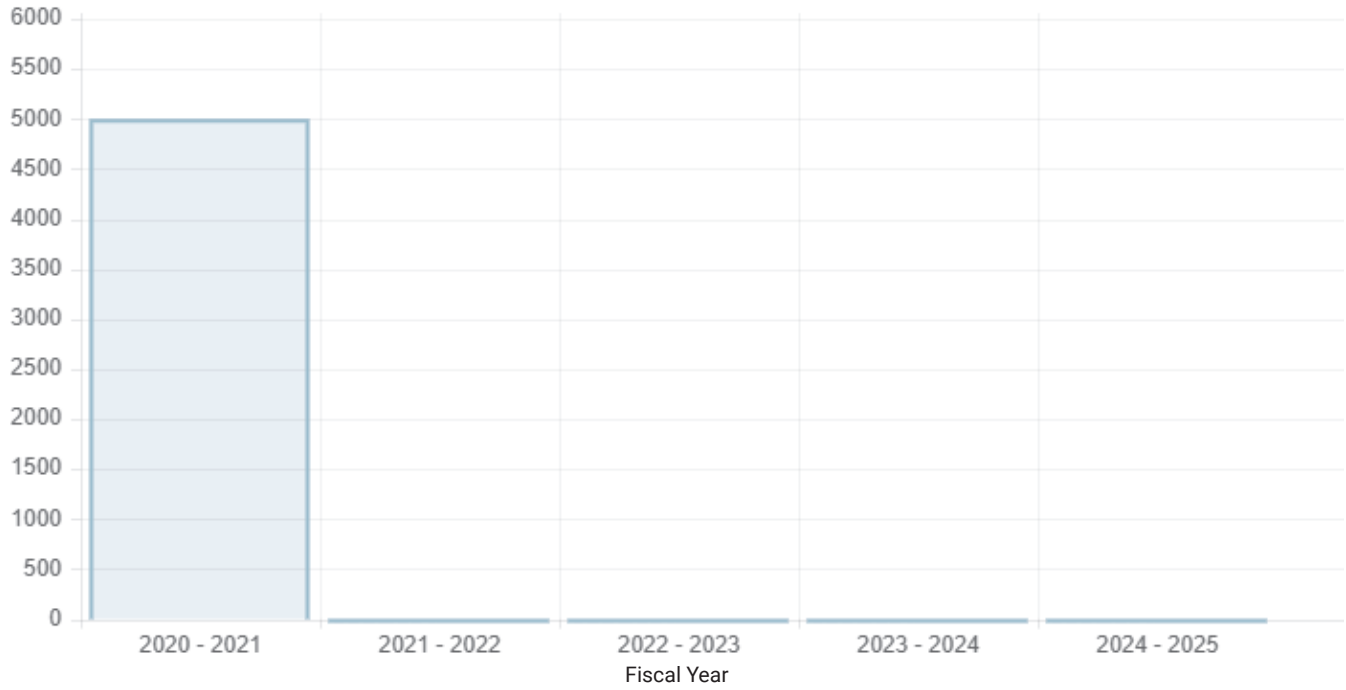
2021 Transportation Improvement Program

Project Type: Transit  
MPO Project No.: TA4466531  
Type of Work: TRANSIT SERVICE DEMONSTRATION  
TIP Year: 2021  
Construction Year:  
From:  
To:  
Agency: FL Dept. of Transportation  
Management Agency: FDOT  
Agency Project No: 4466531  
Status:  
Contact Person:  
Contact Email:  
Contact Phone:  
Description:

## Funding Information \$(thousands)

Project Phase	Funding	2020 - 2021	2021 - 2022	2022 - 2023	2023 - 2024	2024 - 2025
OPERATIONS	DPTO	\$1,250	\$0	\$0	\$0	\$0
OPERATIONS	LF	\$3,751	\$0	\$0	\$0	\$0

Funding Chart \$(thousands)





## Project Details - MDT135

Field Name	Field Value
LRTP Project Code	MDT135
Facility	Beach Corridor
Limit From	Midtown Miami and Downtown
Limit To	Miami Beach Convention Center
Description	Rapid Transit connecting Midtown / Miami CBD to Miami Beach Convention Center area.
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	
Project Costs Funded	\$111.186M
Total Capital Cost	\$897M

## Priority Data

	P1 2020-2025(Y-O-E\$)	P2 2026-2030(Y-O-E\$)	P3 2031-2035(Y-O-E\$)	P4 2036-2045(Y-O-E\$)
Preliminary Engineering	\$2.973M	\$M	\$M	\$111.186M
Right of Way	\$M	\$M	\$M	\$M
Construction	\$M	\$M	\$M	\$M
Operations and Maintenance	\$M	\$M	\$M	\$M
Capital	\$M	\$M	\$M	\$M

Project Details - MDT231

Field Name	Field Value
LRTP Project Code	MDT231
Facility	Beach Express South
Limit From	Miami Beach Convention Center
Limit To	Downtown Intermodal Terminal
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	
Project Costs Funded	\$201.292M
Total Capital Cost	\$9.6M

Priority Data

	P1 2020-2025(Y-O-E\$)	P2 2026-2030(Y-O-E\$)	P3 2031-2035(Y-O-E\$)	P4 2036-2045(Y-O-E\$)
Preliminary Engineering	\$1.595M	\$M	\$M	\$M
Right of Way	\$M	\$M	\$M	\$M
Construction	\$9.762M	\$M	\$M	\$M
Operations and Maintenance	\$6.283M	\$34.848M	\$40.92M	\$M
Capital	\$M	\$M	\$M	\$M

## 8. PROJECT BANK

### PRIORITY 1 PROJECTS

Table 39: Priority 1 Projects

PROJECT NUMBER	PROJECT NAME	CITY AREA	PROJECT TYPE	FROM	TO	PROJECT LENGTH (MILES)	PROJECT DESCRIPTION	PURPOSE & NEED
1	SR A1A / MacArthur Causeway Complete Streets Feasibility Study	South	Multimodal	Downtown	Collins Avenue	3.80	Review of design alternatives for exclusive transit lanes and bicycle lanes along MacArthur Causeway (Phase I)	SR A1A/MacArthur Causeway requires an improvement towards regional and local connectivity. Improve the speed, reliability, comfort and convenience of transit. Serve new markets and support economic vitality.
2	Miami Beach Light Rail/Modern Street Car	South	Multimodal	S.Pointe Drive & SR A1A/5th Street	Washington Avenue & Dade Boulevard	4.55 (Rail Lane) and 4.70 (Protected Bike Lanes)	Exclusive transit and protected/buffered bicycle lanes (Lane repurposing and/or roadway widening)	South Beach requires an improvement for regional and local connectivity. Improve the speed, reliability, comfort and convenience of transit.

PROJECT BANK – PRIORITY 1 PROJECTS

PROJECT NUMBER	PROJECT NAME	CITY AREA	PROJECT TYPE	FROM	TO	PROJECT LENGTH (MILES)	PROJECT DESCRIPTION	PURPOSE & NEED
18	SR A1A / 5th Street and SR 907 / Alton Road Intersection Improvements	South	Bike/Ped	N/A	N/A	N/A	Provide Enhanced Crosswalks and improved sidewalk crossings.	Improve multimodal vehicular operations will be pursued at the Intersection of SR A1A / 5th Street AND SR 907 / Alton Road
19	Dickens Avenue and SR 934 / 71 <sup>st</sup> Street Geometric Modifications	North	Roadway	N/A	N/A	N/A	Feasibility study for Geometric Modifications including an additional Southbound Lane	This site requires examination for improved capacity and functionality. Examining the potential addition of a Southbound Lane gives the area the opportunity to improve roadway traffic.
20	SR A1A / MacArthur Causeway and SR A1A / 5th Street's Feasibility Study of Adaptive Signal Controls	South	Roadway	Fountain Street	Washington Avenue	2	Feasibility Study of Adaptive Signal Controls	Improve multimodal vehicular operations will be pursued along the corridor of SR A1A / MacArthur Causeway / 5th Street

# PROJECT BANK – PRIORITY 3 PROJECTS

PROJECT NUMBER	PROJECT NAME	CITY AREA	PROJECT TYPE	FROM	TO	PROJECT LENGTH (MILES)	PROJECT DESCRIPTION	PURPOSE & NEED
25	SR A1A / MacArthur Causeway Light Rail Connection/ Shared-Use Path	South	Transit/ Bike&Ped	US 1 / Biscayne Boulevard	SR 907 / Alton Road	3.41	Light Rail Connection across the Bay/ Protected Bicycle Lanes ( <i>Lane repurposing and/or roadway widening</i> ), Enhanced crosswalks	SR A1A / MacArthur Causeway requires an improvement towards regional and local connectivity. Improve the speed, reliability, comfort and convenience of transit. Serve new markets and support economic vitality.
26	SR 112 / 41st Street Exclusive transit lanes and protected/buffered bicycle lanes	Middle	Transit/ Bike/Ped	SR 907 / Alton Road	Beachwalk	0.87	Exclusive transit lanes and protected/buffered bicycle lanes ( <i>Lane repurposing</i> ) <i>Enhanced crosswalks</i>	SR 112/41st Street requires an improvement towards regional and local connectivity. Improve the speed, reliability, comfort and convenience of transit. Serve new markets and support economic vitality.
27	SR 112 / Julia Tuttle Causeway Exclusive Transit Lane/Shared-Use Path	Middle	Multimodal	US-1 / Biscayne Blvd	SR 907 / Alton Road	3.18	Exclusive Transit Lane and Shared-Use Path. This project required extensive bridge work.	SR 112 / Julia Tuttle Causeway requires an improvement towards local non-motorized transportation infrastructure connectivity. Develop a safe, complete, and accessible multi-user citywide bicycle and pedestrian network. Promote non-motorized transportation as a reliable mode of travel within the City.

# **Appendix F**

## **Trip Generation**

Scenario - 2

Scenario Name: Terminal Island Proposed - July 9 2021

User Group:

Dev. phase: 1

No. of Years to

Project Traffic :

Analyst Note:

Warning: The time periods among the land uses do not appear to match.

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source		Location	IV	Size	Time Period	Method	Entry Split%	Exit Split%	Total
710(3) - General Office Building		General Urban/Suburban	Employees	932	Weekday	Best Fit (LOG) $\ln(T) = 0.80\ln(X) + 2.51$	1461	1461	2922
Data Source: Trip Gen Manual, 10th Ed							50%	50%	
710(4) - General Office Building		General Urban/Suburban	Employees	932	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Best Fit (LOG) $\ln(T) = 0.72\ln(X) + 0.56$	200	41	241
Data Source: Trip Gen Manual, 10th Ed							83%	17%	
710(5) - General Office Building		General Urban/Suburban	Employees	932	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Best Fit (LIN) $T = 0.27(X) + 23.57$	55	220	275
Data Source: Trip Gen Manual, 10th Ed							20%	80%	
931 - Quality Restaurant		General Urban/Suburban	Seats	299	Weekday	Average 2.60	389	389	778
Data Source: Trip Gen Manual, 10th Ed							50%	50%	
931(1) - Quality Restaurant		General Urban/Suburban	Seats	299	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Average 0.02	3	3	6
Data Source: Trip Gen Manual, 10th Ed							50%	50%	
931(2) - Quality Restaurant		General Urban/Suburban	Seats	299	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Average 0.28	56	28	84
Data Source: Trip Gen Manual, 10th Ed							67%	33%	

Scenario - 3

Scenario Name: Saturday

User Group:

Dev. phase: 1

No. of Years to

Project Traffic :

Analyst Note:

Warning: The time periods among the land uses do not appear to match.

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method		Entry	Exit	Total
					Rate/Equation	Average	Split%	Split%	
931 - Quality Restaurant	General	Seats	299	Saturday	2.57		50%	384	768
Data Source: Trip Generation Manual, 10th Ed	Urban/Suburban				Average			50%	
931(1) - Quality Restaurant	General	Seats	299	Saturday, Peak Hour of Generator	0.33		58	40	98
Data Source: Trip Generation Manual, 10th Ed	Urban/Suburban				Average			59%	



S0801

## COMMUTING CHARACTERISTICS BY SEX

2013-2017 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Technical Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities, and towns and estimates of housing units for states and counties.

Subject	Census Tract 9810, Miami-Dade County, Florida				
	Total		Male		Female
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate
Workers 16 years and over	62	+/-21	53	+/-19	9
MEANS OF TRANSPORTATION TO WORK					
Car, truck, or van	51.6%	+/-32.9	52.8%	+/-35.4	44.4%
Drove alone	43.5%	+/-37.2	43.4%	+/-40.3	44.4%
Carpooled	8.1%	+/-14.9	9.4%	+/-17.4	0.0%
In 2-person carpool	8.1%	+/-14.9	9.4%	+/-17.4	0.0%
In 3-person carpool	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
In 4-or-more person carpool	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Workers per car, truck, or van	N	N	N	N	N
Public transportation (excluding taxicab)	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Walked	12.9%	+/-25.0	15.1%	+/-29.5	0.0%
Bicycle	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Taxicab, motorcycle, or other means	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Worked at home	35.5%	+/-27.4	32.1%	+/-29.5	55.6%
PLACE OF WORK					
Worked in state of residence	100.0%	+/-41.8	100.0%	+/-45.2	100.0%
Worked in county of residence	100.0%	+/-41.8	100.0%	+/-45.2	100.0%
Worked outside county of residence	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Worked outside state of residence	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Living in a place	100.0%	+/-41.8	100.0%	+/-45.2	100.0%
Worked in place of residence	100.0%	+/-41.8	100.0%	+/-45.2	100.0%
Worked outside place of residence	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Not living in a place	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Living in 12 selected states	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Worked in minor civil division of residence	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Worked outside minor civil division of residence	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Not living in 12 selected states	100.0%	+/-41.8	100.0%	+/-45.2	100.0%
Workers 16 years and over who did not work at home	40	+/-23	36	+/-18	4
TIME LEAVING HOME TO GO TO WORK					



Subject	Census Tract 9810, Miami-Dade County, Florida				
	Total		Male		Female
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate
12:00 a.m. to 4:59 a.m.	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
5:00 a.m. to 5:29 a.m.	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
5:30 a.m. to 5:59 a.m.	20.0%	+/-45.7	22.2%	+/-49.9	0.0%
6:00 a.m. to 6:29 a.m.	30.0%	+/-36.4	33.3%	+/-41.7	0.0%
6:30 a.m. to 6:59 a.m.	30.0%	+/-38.5	22.2%	+/-43.0	100.0%
7:00 a.m. to 7:29 a.m.	20.0%	+/-38.5	22.2%	+/-42.3	0.0%
7:30 a.m. to 7:59 a.m.	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
8:00 a.m. to 8:29 a.m.	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
8:30 a.m. to 8:59 a.m.	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
9:00 a.m. to 11:59 p.m.	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
TRAVEL TIME TO WORK					
Less than 10 minutes	42.5%	+/-51.7	36.1%	+/-57.0	100.0%
10 to 14 minutes	37.5%	+/-45.5	41.7%	+/-51.2	0.0%
15 to 19 minutes	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
20 to 24 minutes	20.0%	+/-45.7	22.2%	+/-49.9	0.0%
25 to 29 minutes	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
30 to 34 minutes	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
35 to 44 minutes	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
45 to 59 minutes	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
60 or more minutes	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
Mean travel time to work (minutes)	N	N	N	N	N
VEHICLES AVAILABLE					
Workers 16 years and over in households	0	+/-13	0	+/-13	0
No vehicle available	-	**	-	**	-
1 vehicle available	-	**	-	**	-
2 vehicles available	-	**	-	**	-
3 or more vehicles available	-	**	-	**	-
PERCENT ALLOCATED					
Means of transportation to work	0.0%	(X)	(X)	(X)	(X)
Private vehicle occupancy	28.1%	(X)	(X)	(X)	(X)
Place of work	100.0%	(X)	(X)	(X)	(X)
Time leaving home to go to work	0.0%	(X)	(X)	(X)	(X)
Travel time to work	0.0%	(X)	(X)	(X)	(X)
Vehicles available	-	(X)	(X)	(X)	(X)

Subject	Census Tract 9810, Miami-Dade County, Florida
	Female
	Margin of Error
Workers 16 years and over	+/-9
MEANS OF TRANSPORTATION TO WORK	
Car, truck, or van	+/-55.6
Drove alone	+/-55.6
Carpooled	+/-100.0
In 2-person carpool	+/-100.0
In 3-person carpool	+/-100.0
In 4-or-more person carpool	+/-100.0
Workers per car, truck, or van	N
Public transportation (excluding taxicab)	+/-100.0
Walked	+/-100.0
Bicycle	+/-100.0
Taxicab, motorcycle, or other means	+/-100.0
Worked at home	+/-55.6
PLACE OF WORK	
Worked in state of residence	+/-100.0
Worked in county of residence	+/-100.0
Worked outside county of residence	+/-100.0
Worked outside state of residence	+/-100.0
Living in a place	
Worked in place of residence	+/-100.0
Worked outside place of residence	+/-100.0
Not living in a place	+/-100.0
Living in 12 selected states	
Worked in minor civil division of residence	+/-100.0
Worked outside minor civil division of residence	+/-100.0
Not living in 12 selected states	+/-100.0
Workers 16 years and over who did not work at home	
	+/-8
TIME LEAVING HOME TO GO TO WORK	
12:00 a.m. to 4:59 a.m.	+/-100.0
5:00 a.m. to 5:29 a.m.	+/-100.0
5:30 a.m. to 5:59 a.m.	+/-100.0
6:00 a.m. to 6:29 a.m.	+/-100.0
6:30 a.m. to 6:59 a.m.	+/-100.0
7:00 a.m. to 7:29 a.m.	+/-100.0
7:30 a.m. to 7:59 a.m.	+/-100.0
8:00 a.m. to 8:29 a.m.	+/-100.0
8:30 a.m. to 8:59 a.m.	+/-100.0
9:00 a.m. to 11:59 p.m.	+/-100.0
TRAVEL TIME TO WORK	
Less than 10 minutes	+/-100.0
10 to 14 minutes	+/-100.0
15 to 19 minutes	+/-100.0
20 to 24 minutes	+/-100.0
25 to 29 minutes	+/-100.0
30 to 34 minutes	+/-100.0
35 to 44 minutes	+/-100.0
45 to 59 minutes	+/-100.0
60 or more minutes	+/-100.0
Mean travel time to work (minutes)	N

Subject	Census Tract 9810, Miami-Dade County, Florida
	Female
	Margin of Error
VEHICLES AVAILABLE	
Workers 16 years and over in households	+/-13
No vehicle available	**
1 vehicle available	**
2 vehicles available	**
3 or more vehicles available	**
PERCENT ALLOCATED	
Means of transportation to work	(X)
Private vehicle occupancy	(X)
Place of work	(X)
Time leaving home to go to work	(X)
Travel time to work	(X)
Vehicles available	(X)

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

The 12 selected states are Connecticut, Maine, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Wisconsin.

Workers include members of the Armed Forces and civilians who were at work last week.

When information is missing or inconsistent, the Census Bureau logically assigns an acceptable value using the response to a related question or questions. If a logical assignment is not possible, data are filled using a statistical process called allocation, which uses a similar individual or household to provide a donor value. The "Allocated" section is the number of respondents who received an allocated value for a particular subject.

While the 2013-2017 American Community Survey (ACS) data generally reflect the February 2013 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural populations, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2010 data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

#### Explanation of Symbols:

1. An '\*\*\*' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
5. An '\*\*\*\*' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
6. An '\*\*\*\*\*' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
7. An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
8. An '(X)' means that the estimate is not applicable or not available.



## AM Peak Hour Trip Generation and Internalization

*Terminal Island Miami Beach*

Office Land Use 710 932 Employees			Restaurant Land Use 931 299 Seats			
In	Out		In	Out		
200	41		3	3	247 ITE Trips	
UNBALANCED INTERNALIZATION						
63% 26		1	23% 1			
14% 28		1	31% 1			
Office			Restaurant			
In	Out		In	Out		
200	41		3	3	247 Vehicle Trips	
BALANCED INTERNALIZATION						
-1			-1			
-1			-1			
-1	-1		-1	-1	-4 Internal	
199	40		2	2	243 External Trips	
	0.8%			33.3%	1.6% % Internal	
-6	-1		0	0	-7 -3.0% Transit/Pedestrian	
193	39		2	2	236	
			0	0	0 0% Passby (Restaurant)	
193	39		2	2	236 Net New External Trips	

## PM Peak Hour Trip Generation and Internalization

*Terminal Island Miami Beach*

Office Land Use 710 932 Employees		Restaurant Land Use 931 299 Seats		
In	Out	In	Out	
55	220	56	28	359 ITE Trips
<b>UNBALANCED INTERNALIZATION</b>				
30% 17	4% 9	2% 1	3% 1	
	1		1	
	1		1	
Office		Restaurant		
In	Out	In	Out	
55	220	56	28	359 Vehicle Trips
<b>BALANCED INTERNALIZATION</b>				
-1	-1	-1	-1	
54	219	55	27	
	0.7%		2.4%	
-2	-7	-2	-1	
52	212	53	26	
		-4	-4	
52	212	49	22	335 Net New External Trips

## ONE ISLAND OPERATIONAL PLAN

The project consists of office, and restaurant or food service uses, along with the existing marina, as permitted in the I-1 zoning district (the "Project"). The operational criteria for the Project is provided below:

### ***Office***

1. Principal hours of operation shall be during customary business hours, 7:00 AM to 6:00 PM, Monday through Friday. After-hours access will be permitted to authorized individuals via a controlled access security system (i.e., access cards or other comparable system).
2. Maximum occupant content of approximately  $\pm 1,425$  persons for office floors, not including lobby.
3. Maximum number of employees allowed in the offices at one time per floor shall be  $\pm 233$ .

### ***Restaurant/Food Service***

4. Approximately  $\pm 60$  outdoor seats plus additional patron area.
5. Maximum occupant content of approximately  $\pm 299$  persons, if permitted by the Fire Marshal.
6. Maximum hours of operation shall be limited to 7:00 AM to 3:00 AM, Sunday through Saturday.
7. Maximum of  $\pm 50$  employees per shift, during normal operations (not including special events).
8. Special Events may occur on the premises, subject to City ordinances, rules or regulations, and may exceed the hours of operation and occupancy loads specified herein, if permitted by the Fire Marshal.

### ***Marina***

9. Maximum hours of operation shall be 24 hours a day, seven (7) days per week.
10. Maximum of seven (7) wet slips.
11. Maximum of  $\pm 10$  employees per shift, not including private yacht crew members.

### ***General Operations; Deliveries; Loading; Trash; Security and Valet***

12. All on-site trash disposal, and other equipment and supplies shall be physically blocked from view and noise limited by a wall and roofed enclosures within the Property.
13. All trash rooms shall be air conditioned and enclosed.
14. Trash bins shall be wheeled out via the service elevator to main dumpster(s) located in the loading dock area. Trash removal from main dumpster(s) shall take place non-peak business hours (customary peak business hours are between 7-10 AM and 4-6 PM).

# **Appendix G**

## **Queuing Analysis Letter**



November 5, 2021

Mr. Firat Akcay  
Transportation Analyst  
City of Miami Beach  
Transportation and Mobility Department  
1688 Meridian Avenue, Suite 801, Miami Beach, FL 33139  
305.673.7000, Ext 26839  
[FiratAkcay@miamibeachfl.gov](mailto:FiratAkcay@miamibeachfl.gov)

**RE: Terminal Island Miami Beach Queuing Analysis - #20129**

Dear Firat,

The project is located at 120 MacArthur Causeway (Terminal Island) in Miami Beach, Florida. The project proposes a new office building with approximately 932 employees and a 299-seat restaurant. The existing six boat berth marina will remain. Access to the site will be provided via the internal roadway on Terminal Island which provides access to MacArthur Causeway.

The purpose of this letter is to conduct a queuing analysis for the proposed gated entrance to the development. Per the developer, the gate will remain open through the day with a security guard and will close at night. At night the building can only be access with an FOB system. The gates will also be open during restaurant operations.

**Queuing Analysis**

The queuing analysis was performed based on the methodology outlined in the Institute of Transportation Engineers (ITE) Transportation and Land Development. The analysis was performed to determine if there is sufficient storage to accommodate the anticipated queue at the proposed site entrances during the peak hour (worst case scenario) so that the queue does not extend past the property line (95% confidence level analysis).

Trip generation for the proposed project was estimated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10<sup>th</sup> Edition, which provides gross trip generation rates and/or equations by land use type. These rates and equations estimate vehicle trip ends at a free-standing site's driveways. ITE trip generation worksheets are provided in Appendix A.

The proposed development plan incorporates office and restaurant land uses, which can satisfy the lunch/dinner trip for some employees, and visitors without making a trip off-site. An internalization matrix was developed to establish the appropriate number of internal project trips. Internal capture rates used are also included in Appendix A.

ITE research shows that a certain percent of restaurant trips are “*pass-by*” trips. These are described as trips “attracted from the traffic passing the site on an adjacent street.” These are not new trips, but trips already using the existing roadway network that stop at the proposed use and go back to their original path. Pass-by trips for this use were established based on guidelines provided in ITE’s *Trip Generation Handbook* 3<sup>rd</sup> Edition. The average pass-by rate published by ITE for restaurant use is 44% during the PM peak hour however, as discussed with the City reviewer, a 10% reduction was used for pass-by applied to restaurant trips.

The study area is pedestrian and bicyclist friendly and transit is readily US Census data shows an existing 12.9% overall use of other modes of transportation in the US Census Tract 9810 where the project is located (see Appendix A). However, for a conservative analysis and as discussed with the City reviewer, a 3% reduction will be used for other modes of transportations. The project trip generation summary is provided in Exhibit 1.

Exhibit 1: Project Internalization Summary  
Proposed Uses Internalization Summary

Proposed Use and Designation	Employees	Daily Trips	Peak Hours			Peak Hours		
			Total			Total		
Office (Land Use 710)	932 Employees	2,922	200	41	241	55	220	275
Restaurant (Land Use 931)	299 Seats	778	3	3	6	56	28	84
Loss Externalities								
Internalization AM, PM		1.6%, 1.1%	-2	-2	-4	-2	-2	-4
Other Modes of Transportation <sup>2</sup>		3%	-6	-1	-7	-4	-8	-12
Pass-By Restaurant (PM) <sup>3</sup>		10%	0	0	0	-4	-4	-8
Proposed Net Externalities								

<sup>1</sup>Based on ITE *Trip Generation Manual*, Tenth Edition

<sup>2</sup>Based on US Census (Tract 9810) is 12.9%, however a 3% was used.

<sup>3</sup>Based on ITE *Trip Generation Handbook*, 3rd Edition (PM pass-by) is 44%, however 10% was used.

The queuing analysis used the single-channel waiting line model with Poisson arrivals and exponential service times. The analysis is based on the coefficient of utilization ( $\rho$ ) which is the ratio of the average arrival rate of vehicles to the average service rate.

$$\rho = \frac{\text{Average Demand Rate}}{\text{Average Service Rate}}$$

The average service rate corresponds to the time it will take a vehicle to gain access through the gate. If the coefficient of utilization is greater than 1, then the calculation will yield an infinite queue length.

The required queue storage (M) is determined using the following equation:

$$M = \left\lceil \frac{\ln P(x > M) - \ln Q_M}{\ln \rho} \right\rceil - 1$$

In this equation,  $P(x > M)$  is set at 5% to yield a 95% confidence that the queue will not back-up onto the adjacent street. Project trip generation for the AM peak hour of the adjacent street (the critical inbound hour) was used in the analysis.

Since the gate will be open and office employees and regular visitors will be able to enter without stopping, the queuing analysis assumed that only 20% of the office trips and all of the restaurant trips will stop a brief security check. Based on this assumption, the highest volume of vehicles stopping at the gate occur during the PM peak hour. A processing rate of 20 seconds per vehicle (0.33 minutes per vehicle) was used. This is the time it will take some visitors to go through and pass the gate. Exhibit 2 provides the queuing calculations based on the Poisson Equation.

#### Exhibit Entering Calculations

$$Q = \text{Processing rate} = \frac{60 \text{ min/hr}}{0.33 \text{ min/process}} = 180 \text{ process/hr}$$

$$q = \text{Demand Rate} = 67 \frac{\text{veh}}{\text{hr}}$$

$$N = \text{Service Positions} = 1 \text{ Lane}$$

$$\rho = \text{Utilization factor} = \frac{q}{(NQ)} = \frac{67 \text{ veh/hr}}{1 \times 180 \text{ process/hr}} = 0.37$$

$$Q_m = \text{Table Value} = 0.37$$

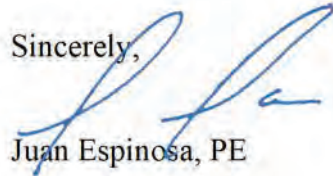
M = queue length which is exceeded 5% of the time  $[P(x > M)]$

$$M = \frac{\ln P(x > M) - \ln(Q_m)}{\ln(\rho)} - 1 = \frac{\ln(0.05) - \ln(0.37)}{\ln 0.37} - 1 = 1.03 \text{ say two vehicles in queue.}$$

The analysis shows that only two vehicles in queue is expected at the gate during the PM peak hour. Based on the site plan, there is approximately 83 feet of storage between the gate and the property line; this distance is enough to accommodate 4 vehicles in the queue. Therefore, no spillback onto the adjacent street is expected.

We stand ready to provide any support needed for this proposed project. Should you have any questions or comments, please call me at (305) 447-0900.

Sincerely,



Juan Espinosa, PE

Vice President – Transportation

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# **Appendix A**

## **Trip Generation**

## AM Peak Hour Trip Generation and Internalization

*Terminal Island Miami Beach*

Office Land Use 710 932 Employees		Restaurant Land Use 931 299 Seats		
In	Out	In	Out	
200	41	3	3	247 ITE Trips
<b>UNBALANCED INTERNALIZATION</b>				
14% 28	63% 26	23% 1	31% 1	
	1		1	
<b>BALANCED INTERNALIZATION</b>				
-1	-1	-1	-1	
199	40	2	2	
	0.8%		33.3%	
-6	-1	0	0	
193	39	2	2	
		0	0	
193	39	2	2	236 Net New External Trips

## PM Peak Hour Trip Generation and Internalization

*Terminal Island Miami Beach*

Office Land Use 710 932 Employees		Restaurant Land Use 931 299 Seats		
In	Out	In	Out	
55	220	56	28	359 ITE Trips
<b>UNBALANCED INTERNALIZATION</b>				
4% 9		2% 1		
30% 17	1	3% 1		
<b>BALANCED INTERNALIZATION</b>				
-1	-1	-1	-1	-4 Internal
54	219 0.7%	55	27 2.4%	355 External Trips 1.1% % Internal
-2 52	-7 212	-2 53	-1 26	-12 -3.0% Transit/Pedestrian 343
		-4	-4	-8 -10% Passby (Restaurant)
52	212	49	22	335 Net New External Trips

Scenario - 2

Scenario Name: Terminal Island Proposed - July 9 2021

User Group:

Dev. phase: 1

No. of Years to

Project Traffic :

Analyst Note:

Warning: The time periods among the land uses do not appear to match.

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source		Location	IV	Size	Time Period	Method	Entry Split%	Exit Split%	Total
710(3) - General Office Building		General Urban/Suburban	Employees	932	Weekday	Best Fit (LOG)	1461	1461	2922
Data Source: Trip Gen Manual, 10th Ed						$\ln(T) = 0.80\ln(X) + 2.51$	50%	50%	
710(4) - General Office Building		General Urban/Suburban	Employees	932	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Best Fit (LOG)	200	41	241
Data Source: Trip Gen Manual, 10th Ed						$\ln(T) = 0.72\ln(X) + 0.56$	83%	17%	
710(5) - General Office Building		General Urban/Suburban	Employees	932	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Best Fit (LIN)	55	220	275
Data Source: Trip Gen Manual, 10th Ed						$T = 0.27(X) + 23.57$	20%	80%	
931 - Quality Restaurant		General Urban/Suburban	Seats	299	Weekday	Average	389	389	778
Data Source: Trip Gen Manual, 10th Ed						2.60	50%	50%	
931(1) - Quality Restaurant		General Urban/Suburban	Seats	299	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Average	3	3	6
Data Source: Trip Gen Manual, 10th Ed						0.02	50%	50%	
931(2) - Quality Restaurant		General Urban/Suburban	Seats	299	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Average	56	28	84
Data Source: Trip Gen Manual, 10th Ed						0.28	67%	33%	





S0801

## COMMUTING CHARACTERISTICS BY SEX

2013-2017 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Technical Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities, and towns and estimates of housing units for states and counties.

Subject	Census Tract 9810, Miami-Dade County, Florida				
	Total		Male		Female
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate
Workers 16 years and over	62	+/-21	53	+/-19	9
MEANS OF TRANSPORTATION TO WORK					
Car, truck, or van	51.6%	+/-32.9	52.8%	+/-35.4	44.4%
Drove alone	43.5%	+/-37.2	43.4%	+/-40.3	44.4%
Carpooled	8.1%	+/-14.9	9.4%	+/-17.4	0.0%
In 2-person carpool	8.1%	+/-14.9	9.4%	+/-17.4	0.0%
In 3-person carpool	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
In 4-or-more person carpool	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Workers per car, truck, or van	N	N	N	N	N
Public transportation (excluding taxicab)	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Walked	12.9%	+/-25.0	15.1%	+/-29.5	0.0%
Bicycle	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Taxicab, motorcycle, or other means	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Worked at home	35.5%	+/-27.4	32.1%	+/-29.5	55.6%
PLACE OF WORK					
Worked in state of residence	100.0%	+/-41.8	100.0%	+/-45.2	100.0%
Worked in county of residence	100.0%	+/-41.8	100.0%	+/-45.2	100.0%
Worked outside county of residence	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Worked outside state of residence	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Living in a place	100.0%	+/-41.8	100.0%	+/-45.2	100.0%
Worked in place of residence	100.0%	+/-41.8	100.0%	+/-45.2	100.0%
Worked outside place of residence	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Not living in a place	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Living in 12 selected states	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Worked in minor civil division of residence	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Worked outside minor civil division of residence	0.0%	+/-41.8	0.0%	+/-45.2	0.0%
Not living in 12 selected states	100.0%	+/-41.8	100.0%	+/-45.2	100.0%
Workers 16 years and over who did not work at home	40	+/-23	36	+/-18	4
TIME LEAVING HOME TO GO TO WORK					

Subject	Census Tract 9810, Miami-Dade County, Florida				
	Total		Male		Female
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate
12:00 a.m. to 4:59 a.m.	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
5:00 a.m. to 5:29 a.m.	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
5:30 a.m. to 5:59 a.m.	20.0%	+/-45.7	22.2%	+/-49.9	0.0%
6:00 a.m. to 6:29 a.m.	30.0%	+/-36.4	33.3%	+/-41.7	0.0%
6:30 a.m. to 6:59 a.m.	30.0%	+/-38.5	22.2%	+/-43.0	100.0%
7:00 a.m. to 7:29 a.m.	20.0%	+/-38.5	22.2%	+/-42.3	0.0%
7:30 a.m. to 7:59 a.m.	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
8:00 a.m. to 8:29 a.m.	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
8:30 a.m. to 8:59 a.m.	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
9:00 a.m. to 11:59 p.m.	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
TRAVEL TIME TO WORK					
Less than 10 minutes	42.5%	+/-51.7	36.1%	+/-57.0	100.0%
10 to 14 minutes	37.5%	+/-45.5	41.7%	+/-51.2	0.0%
15 to 19 minutes	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
20 to 24 minutes	20.0%	+/-45.7	22.2%	+/-49.9	0.0%
25 to 29 minutes	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
30 to 34 minutes	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
35 to 44 minutes	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
45 to 59 minutes	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
60 or more minutes	0.0%	+/-52.0	0.0%	+/-54.8	0.0%
Mean travel time to work (minutes)	N	N	N	N	N
VEHICLES AVAILABLE					
Workers 16 years and over in households	0	+/-13	0	+/-13	0
No vehicle available	-	**	-	**	-
1 vehicle available	-	**	-	**	-
2 vehicles available	-	**	-	**	-
3 or more vehicles available	-	**	-	**	-
PERCENT ALLOCATED					
Means of transportation to work	0.0%	(X)	(X)	(X)	(X)
Private vehicle occupancy	28.1%	(X)	(X)	(X)	(X)
Place of work	100.0%	(X)	(X)	(X)	(X)
Time leaving home to go to work	0.0%	(X)	(X)	(X)	(X)
Travel time to work	0.0%	(X)	(X)	(X)	(X)
Vehicles available	-	(X)	(X)	(X)	(X)

Subject	Census Tract 9810, Miami-Dade County, Florida
	Female
	Margin of Error
Workers 16 years and over	+/-9
MEANS OF TRANSPORTATION TO WORK	
Car, truck, or van	+/-55.6
Drove alone	+/-55.6
Carpooled	+/-100.0
In 2-person carpool	+/-100.0
In 3-person carpool	+/-100.0
In 4-or-more person carpool	+/-100.0
Workers per car, truck, or van	N
Public transportation (excluding taxicab)	+/-100.0
Walked	+/-100.0
Bicycle	+/-100.0
Taxicab, motorcycle, or other means	+/-100.0
Worked at home	+/-55.6
PLACE OF WORK	
Worked in state of residence	+/-100.0
Worked in county of residence	+/-100.0
Worked outside county of residence	+/-100.0
Worked outside state of residence	+/-100.0
Living in a place	
Worked in place of residence	+/-100.0
Worked outside place of residence	+/-100.0
Not living in a place	+/-100.0
Living in 12 selected states	
Worked in minor civil division of residence	+/-100.0
Worked outside minor civil division of residence	+/-100.0
Not living in 12 selected states	+/-100.0
Workers 16 years and over who did not work at home	
	+/-8
TIME LEAVING HOME TO GO TO WORK	
12:00 a.m. to 4:59 a.m.	+/-100.0
5:00 a.m. to 5:29 a.m.	+/-100.0
5:30 a.m. to 5:59 a.m.	+/-100.0
6:00 a.m. to 6:29 a.m.	+/-100.0
6:30 a.m. to 6:59 a.m.	+/-100.0
7:00 a.m. to 7:29 a.m.	+/-100.0
7:30 a.m. to 7:59 a.m.	+/-100.0
8:00 a.m. to 8:29 a.m.	+/-100.0
8:30 a.m. to 8:59 a.m.	+/-100.0
9:00 a.m. to 11:59 p.m.	+/-100.0
TRAVEL TIME TO WORK	
Less than 10 minutes	+/-100.0
10 to 14 minutes	+/-100.0
15 to 19 minutes	+/-100.0
20 to 24 minutes	+/-100.0
25 to 29 minutes	+/-100.0
30 to 34 minutes	+/-100.0
35 to 44 minutes	+/-100.0
45 to 59 minutes	+/-100.0
60 or more minutes	+/-100.0
Mean travel time to work (minutes)	N

Subject	Census Tract 9810, Miami-Dade County, Florida
	Female
	Margin of Error
VEHICLES AVAILABLE	
Workers 16 years and over in households	+/-13
No vehicle available	**
1 vehicle available	**
2 vehicles available	**
3 or more vehicles available	**
PERCENT ALLOCATED	
Means of transportation to work	(X)
Private vehicle occupancy	(X)
Place of work	(X)
Time leaving home to go to work	(X)
Travel time to work	(X)
Vehicles available	(X)

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

The 12 selected states are Connecticut, Maine, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Wisconsin.

Workers include members of the Armed Forces and civilians who were at work last week.

When information is missing or inconsistent, the Census Bureau logically assigns an acceptable value using the response to a related question or questions. If a logical assignment is not possible, data are filled using a statistical process called allocation, which uses a similar individual or household to provide a donor value. The "Allocated" section is the number of respondents who received an allocated value for a particular subject.

While the 2013-2017 American Community Survey (ACS) data generally reflect the February 2013 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural populations, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2010 data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

#### Explanation of Symbols:

1. An '\*\*\*' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
5. An '\*\*\*\*' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
6. An '\*\*\*\*\*' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
7. An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
8. An '(X)' means that the estimate is not applicable or not available.

## ONE ISLAND OPERATIONAL PLAN

The project consists of office, and restaurant or food service uses, along with the existing marina, as permitted in the I-1 zoning district (the "Project"). The operational criteria for the Project is provided below:

### ***Office***

1. Principal hours of operation shall be during customary business hours, 7:00 AM to 6:00 PM, Monday through Friday. After-hours access will be permitted to authorized individuals via a controlled access security system (i.e., access cards or other comparable system).
2. Maximum occupant content of approximately  $\pm 1,425$  persons for office floors, not including lobby.
3. Maximum number of employees allowed in the offices at one time per floor shall be  $\pm 233$ .

### ***Restaurant/Food Service***

4. Approximately  $\pm 60$  outdoor seats plus additional patron area.
5. Maximum occupant content of approximately  $\pm 299$  persons, if permitted by the Fire Marshal.
6. Maximum hours of operation shall be limited to 7:00 AM to 3:00 AM, Sunday through Saturday.
7. Maximum of  $\pm 50$  employees per shift, during normal operations (not including special events).
8. Special Events may occur on the premises, subject to City ordinances, rules or regulations, and may exceed the hours of operation and occupancy loads specified herein, if permitted by the Fire Marshal.

### ***Marina***

9. Maximum hours of operation shall be 24 hours a day, seven (7) days per week.
10. Maximum of seven (7) wet slips.
11. Maximum of  $\pm 10$  employees per shift, not including private yacht crew members.

### ***General Operations; Deliveries; Loading; Trash; Security and Valet***

12. All on-site trash disposal, and other equipment and supplies shall be physically blocked from view and noise limited by a wall and roofed enclosures within the Property.
13. All trash rooms shall be air conditioned and enclosed.
14. Trash bins shall be wheeled out via the service elevator to main dumpster(s) located in the loading dock area. Trash removal from main dumpster(s) shall take place non-peak business hours (customary peak business hours are between 7-10 AM and 4-6 PM).

# **Attachment B**

## **Queuing Documentation**

location, a 5% probability of back-up onto the adjacent street is judged to be acceptable. Demand on the system for design is expected to be 110 vehicles in a 45-minute period. Average service time was expected to be 2.2 minutes. Is the queue storage adequate?

Such problems can be quickly solved using Equation (8-9b) given in Table 8-10 and repeated below for convenience.

$$M = \left[ \frac{\ln P(x > M) - \ln Q_M}{\ln p} \right] - 1$$

where:

$M$  = queue length which is exceeded  $p$  percent of the time

$N$  = number of service channels (drive-in positions)

$Q$  = service rate per channel (vehicles per hour)

$p = \frac{\text{demand rate}}{\text{service rate}} = \frac{q}{NQ}$  = utilization factor

$q$  = demand rate on the system (vehicles per hour)

$Q_M$  = tabled values of the relationship between queue length, number of channels, and utilization factor (see Table 8.11)

**TABLE 8-11**  
Table of  $Q_M$  Values

$p$	$N = 1$	2	3	4	6	8	10
0.0	0.0000	0.0000	0.0000	0.0000			
0.1	.1000	.0182	.0037	.0008	.0000	0.0000	0.0000
.2	.2000	.0666	.0247	.0096	.0015	.0002	.0000
.3	.3000	.1385	.0700	.0370	.0111	.0036	.0011
.4	.4000	.2286	.1411	.0907	.0400	.0185	.0088
.5	.5000	.3333	.2368	.1739	.0991	.0591	.0360
.6	.6000	.4501	.3548	.2870	.1965	.1395	.1013
.7	.7000	.5766	.4923	.4286	.3359	.2706	.2218
.8	.8000	.7111	.6472	.5964	.5178	.4576	.4093
.9	.9000	.8526	.8172	.7878	.7401	.7014	.6687
1.0	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

$$p = \frac{q}{NQ} = \frac{\text{arrival rate, total}}{(\text{number of channels})(\text{service rate per channel})}$$

$N$  = number of channels (service positions)

### Solution

Step 1:  $Q = \frac{60 \text{ min/hr}}{2.2 \text{ min/service}} = 27.3 \text{ services per hour}$

Step 2:  $q = (110 \text{ veh/45 min}) \times (60 \text{ min/hr}) = 146.7 \text{ vehicles per hour}$

Step 3:  $p = \frac{q}{NQ} = \frac{146.7}{(6)(27.3)} = 0.8956$

Step 4:  $Q_M = 0.7303$  by interpolation between 0.8 and 0.9 for  $N = 6$  from the table of  $Q_M$  values (see Table 8-11).

Step 5: The acceptable probability of the queue,  $M$ , being longer than the storage, 18 spaces in this example, was stated to be 5%.  $P(x > M) = 0.05$ , and:

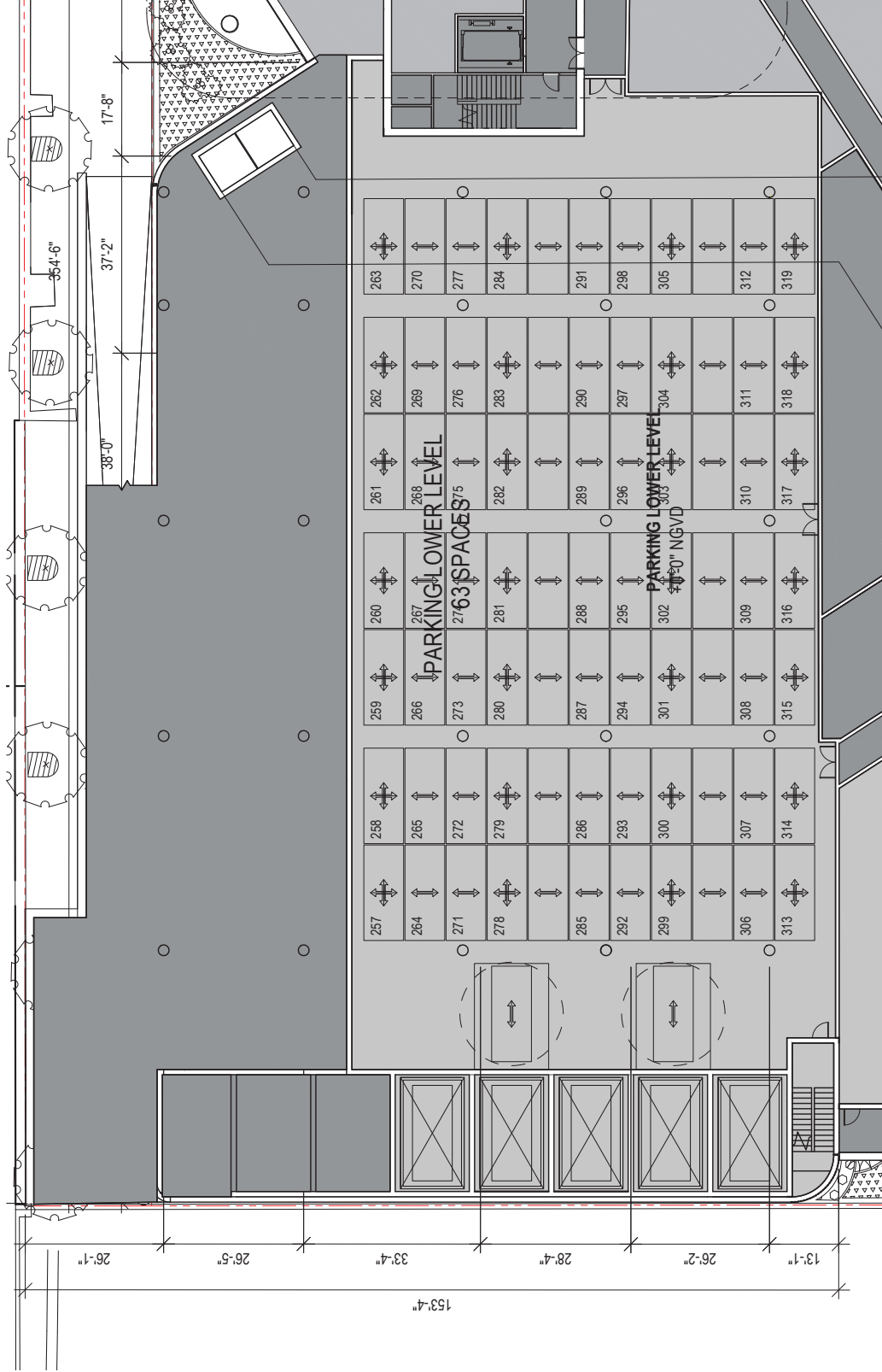
$$M = \left[ \frac{\ln 0.05 - \ln 0.7303}{\ln 0.8956} \right] - 1 = \left[ \frac{-2.996 - (-0.314)}{-0.110} \right] - 1$$

$$= 24.38 - 1 = 23.38, \text{ say } 23 \text{ vehicles.}$$

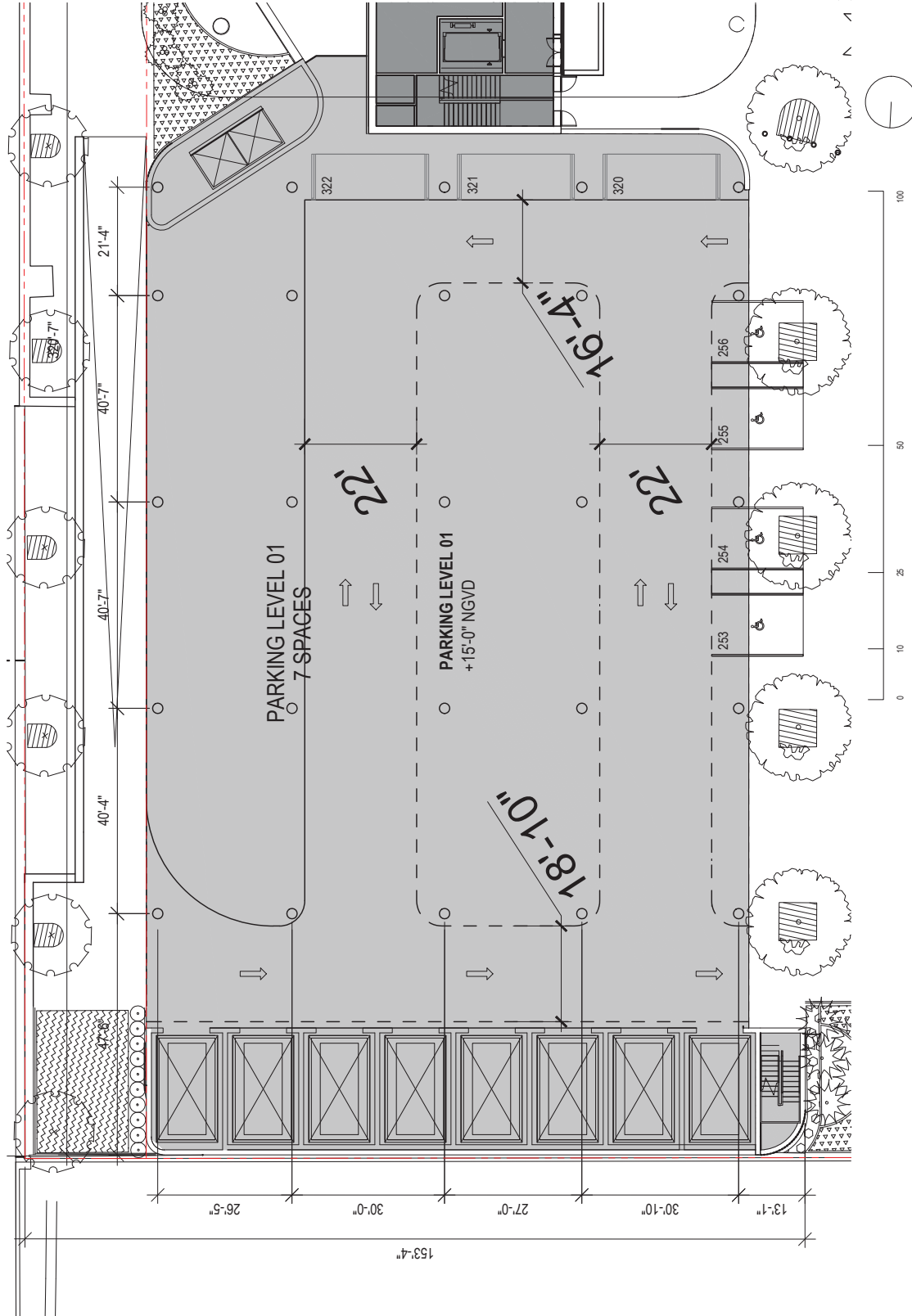
# **Appendix H**

## **Automated Parking Information**





257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319
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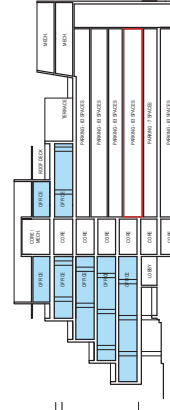
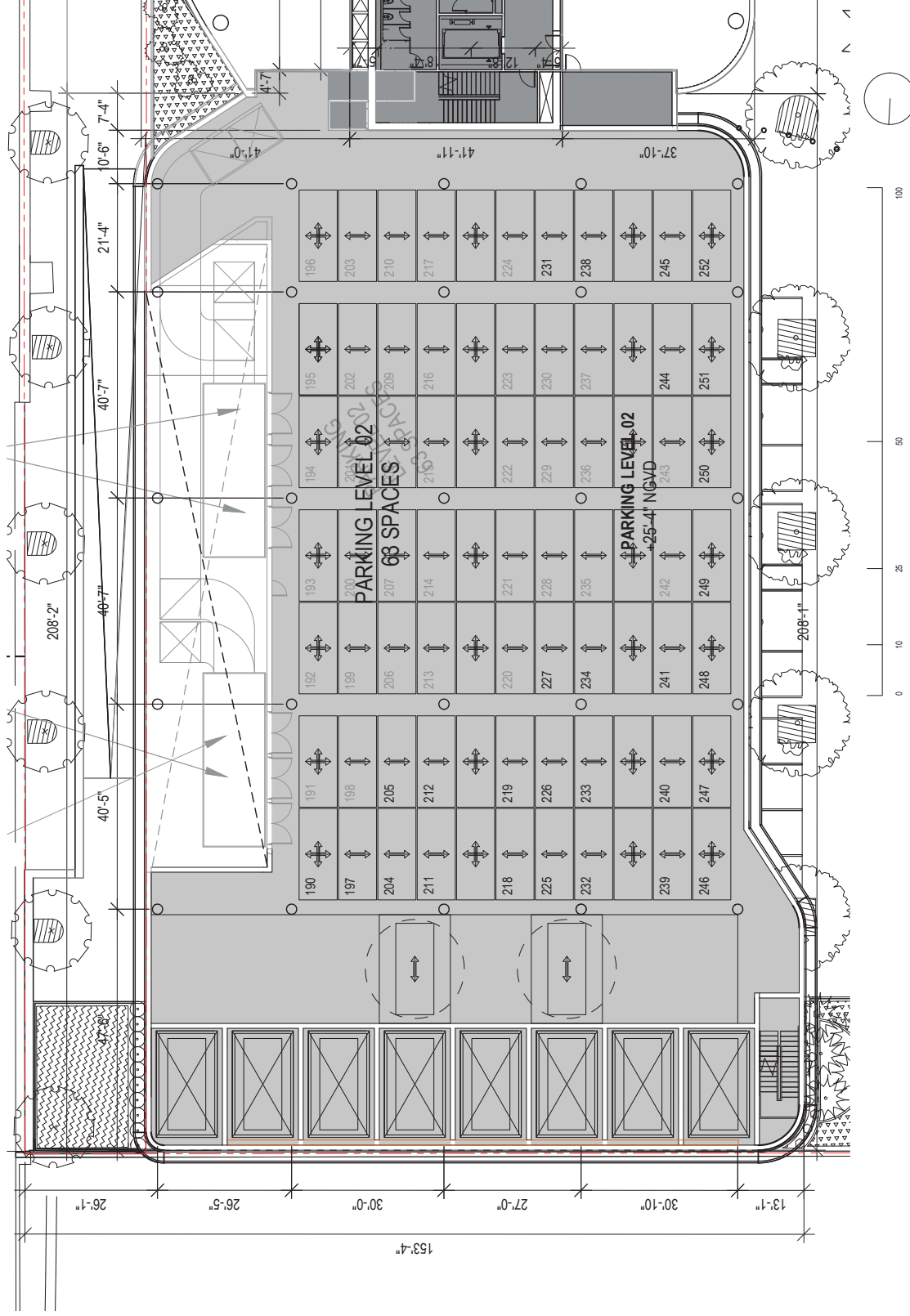
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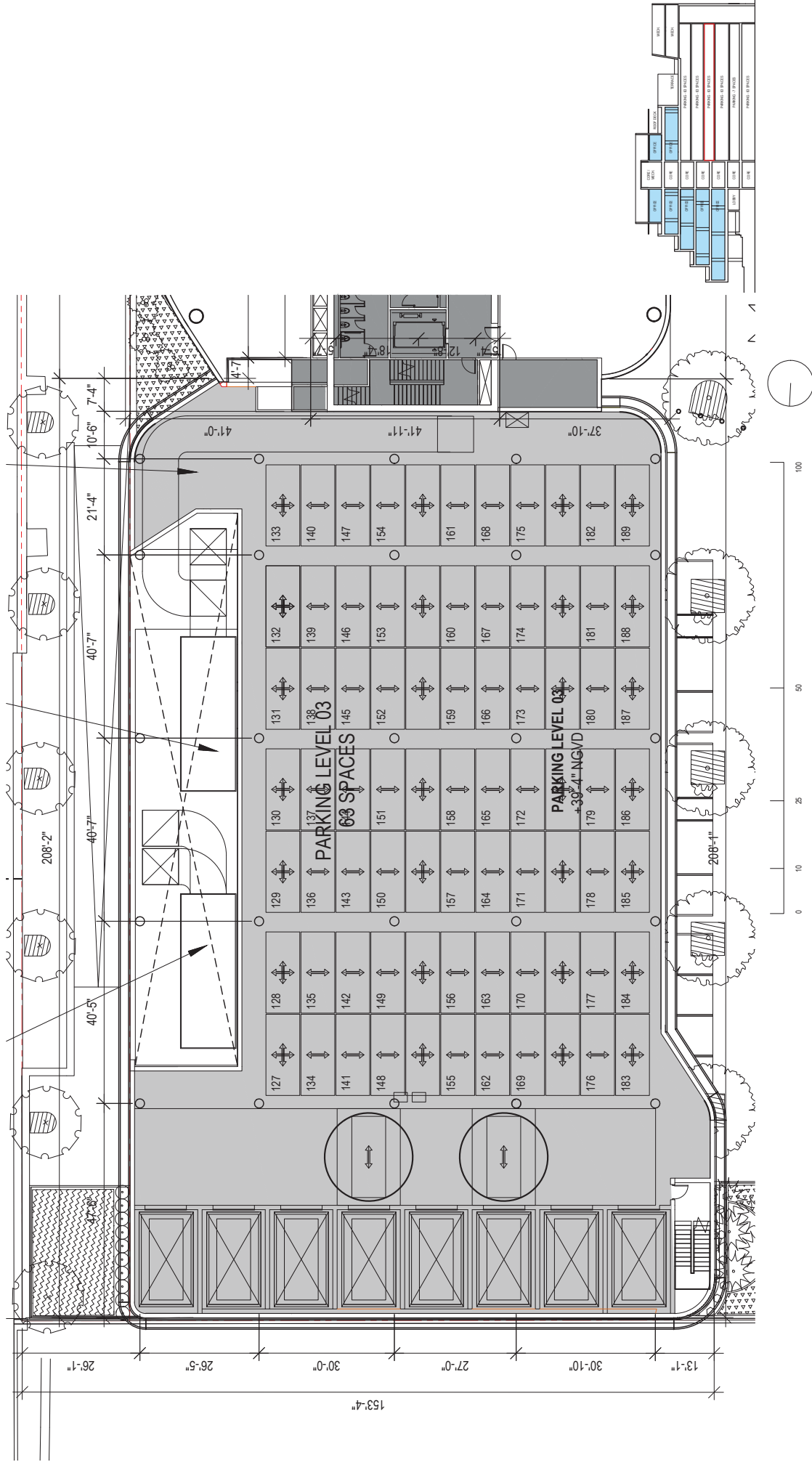
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120 MACARTHUR CAUSEWAY  
MIAMI BEACH, FL

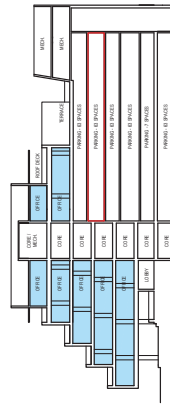
PARKING GARAGE  
LEVEL 01  
SCALE: 1"=20'-0"

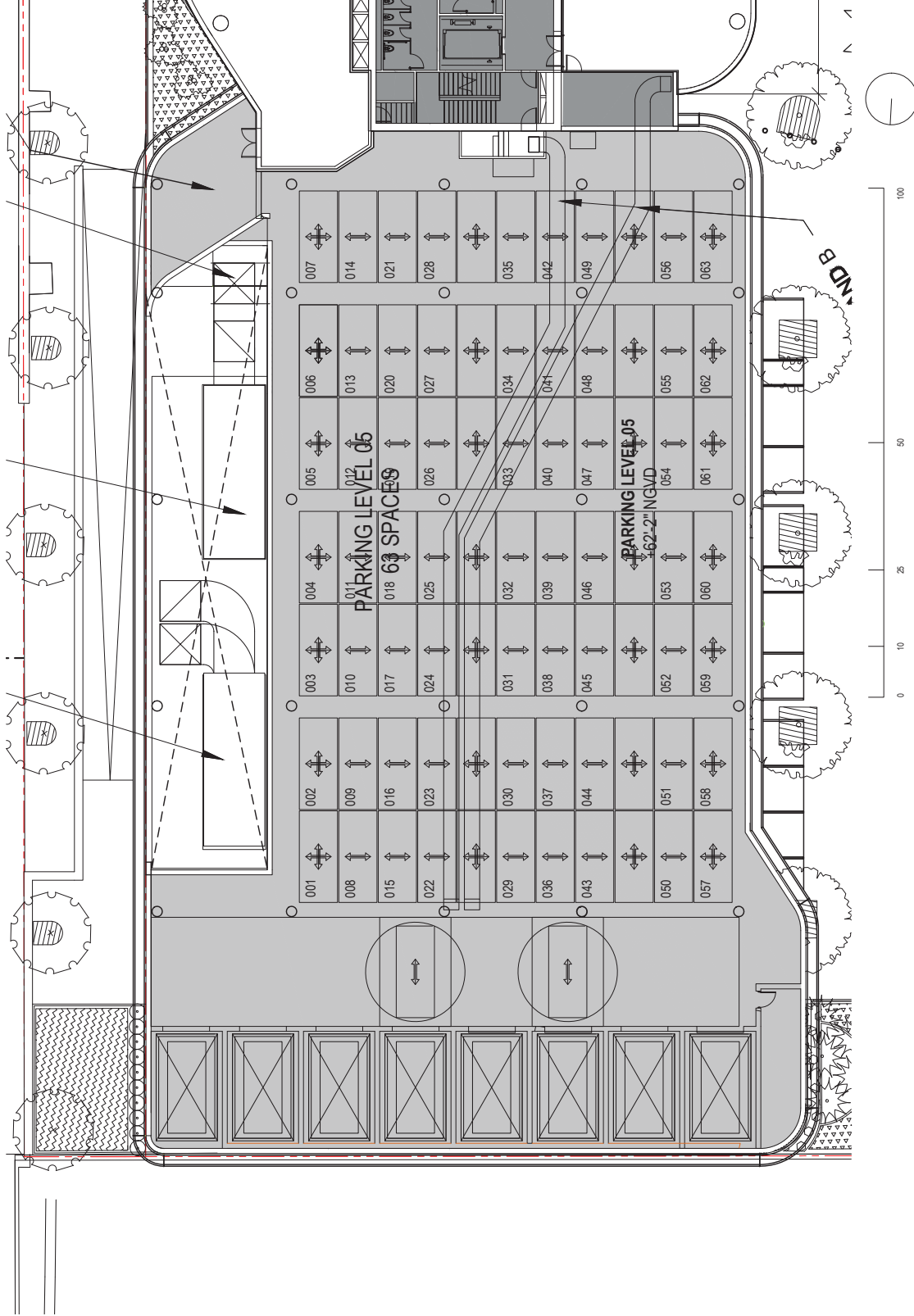
DATE:  
11/08/2021

A1-13









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**DRAFT PB FIRST SUBMITTAL**  
**120 MACARTHUR CAUSEWAY**  
**MIAMI BEACH, FL**

**PARKING GARAGE**  
**LEVEL 05**  
SCALE: 1"=20'-0"

DATE:  
11/08/2021

**A1-17**



## PARKING CONCEPT

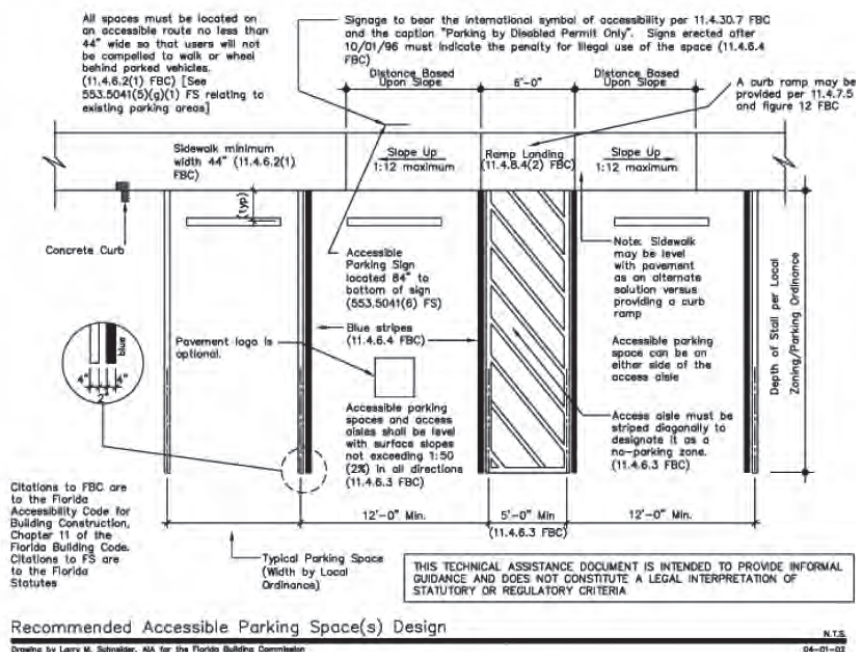
The Terminal Island parking is intended to provide approximately 400 parking spaces for the two office buildings. Thus, the parking concepts developed for the project are based upon this number of parking spaces.

The buildings are being designed as office buildings, as such, minimal parking is intended overnight. The parking is expected to load up over three to four (3-4) hours and similarly exit over a similar period.

The user group contains a significant number of traders, as such, the parking experience is intended to minimize time required for drivers to drop-off a vehicle and enter their vehicles and enter their appropriate building. Thus, most of the parking spaces are intended to be valet parked. In the morning, the drop-off floor will be used as six to eight drive aisles feeding the elevators.

## ACCESSIBLE PARKING

Eight (8) access self-parking will be provided. Five parking spaces adjacent the main building and the remaining spaces adjacent the smaller building. Accessible drivers will also have the option of using the valet parking. However, the federal standards for the minimum number of Van Accessible (2) and Regular accessible (6) parking spaces will be provided.



OCTOBER 12, 2021

## DESIGN VOLUMES BASED UPON CHICAGO ENTRY AND EXIT VOLUMES

The primary tenant has a similar facility in Chicago. Thus, the building entry exit swipes from their Chicago office have been analyzed. The raw data below indicates the number of individuals with a first entry or last exit for weekdays in June. Normally urban centers with congestion and transit alternatives have longer/ more spread-out peak hours than suburban centers. Since both Miami and Chicago are larger urban centers, we believe peaks will be similar.

The total number of entries or exits per day ranges from 718 to 885. The intent of looking at the percentages is to allow a good projection of the peak design percentages which should be used for a day when the parking in Miami Beach is fully utilized.

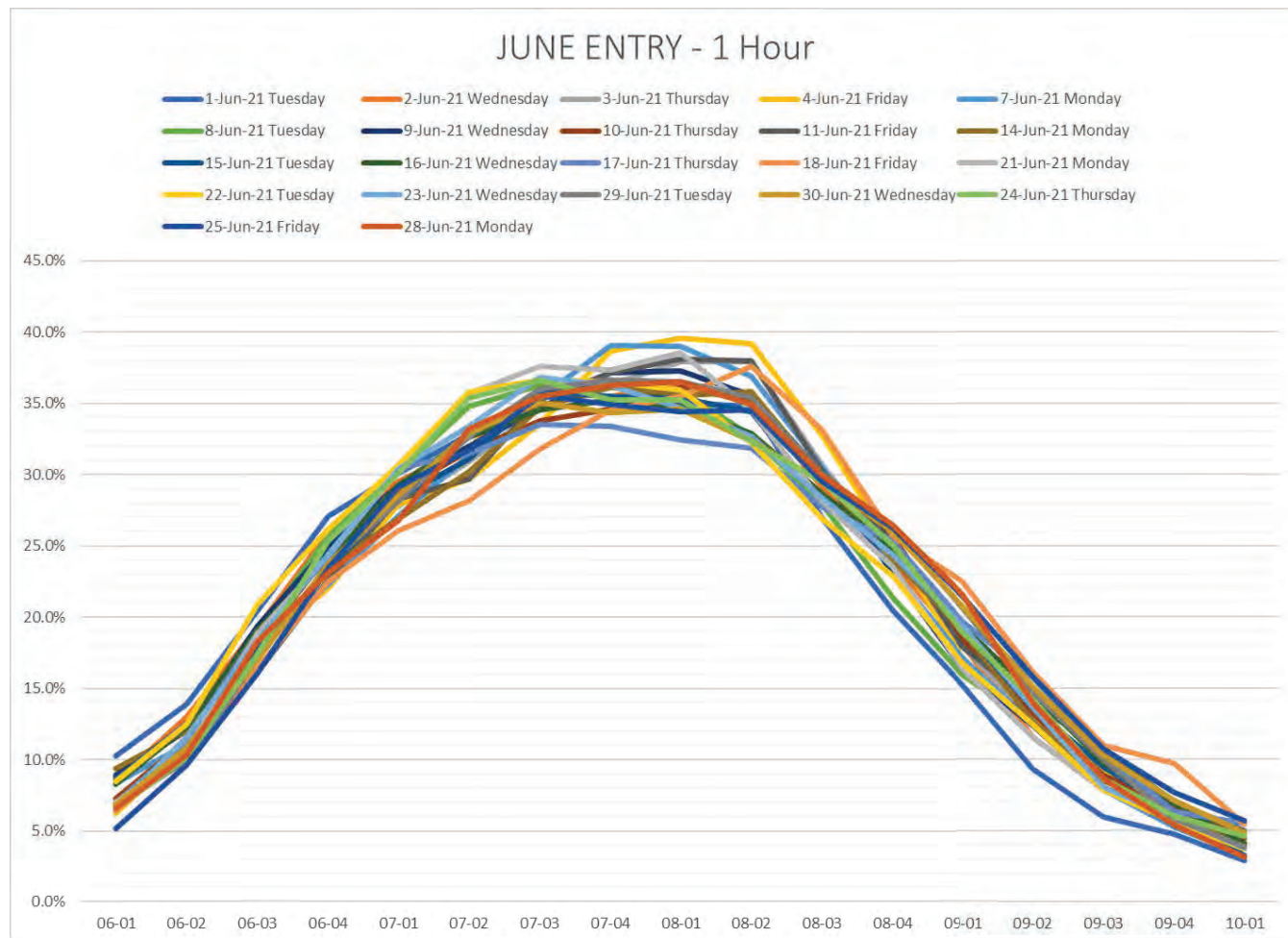
		FIRST SWIPE																								
Date	Weekday	Grand Total	12AM-5AM	5AM-6AM	06-01	06-02	06-03	06-04	07-01	07-02	07-03	07-04	08-01	08-02	08-03	08-04	09-01	09-02	09-03	09-04	10-01	10-02	10-03	10-04	11AM-12AM	
1-Jun-21	Tuesday	808	3	7		9	16	10	48	38	69	64	72	60	94	70	59	58	31	17	17	10	4	7	2	43
2-Jun-21	Wednesday	817	7	13	11	10	17	31	48	61	72	60	68	92	70	66	60	42	26	20	6	12	8	5	12	
3-Jun-21	Thursday	842	2	9	9	15	14	35	38	70	65	61	64	102	79	74	64	41	27	20	19	6	8	2	18	
4-Jun-21	Friday	781	3	8	9	4	14	22	45	59	46	68	59	89	86	75	56	39	25	14	19	13	5	1	22	
7-Jun-21	Monday	865	3	8	9	7	23	33	33	65	62	74	70	100	94	73	52	45	31	20	12	5	8	3	35	
8-Jun-21	Tuesday	885	6	8	9	15	19	35	38	75	79	75	79	88	81	70	50	46	23	22	20	10	5	6	26	
9-Jun-21	Wednesday	872	4	7	11	11	18	38	38	75	66	76	62	98	88	77	47	50	27	19	12	11	6	3	28	
10-Jun-21	Thursday	856	4	8	9	14	8	31	44	72	62	69	68	90	69	82	60	47	30	21	15	10	10	3	30	
11-Jun-21	Friday	764	5	4	8	15	6	24	37	56	56	67	48	98	71	74	47	39	33	18	16	15	4	3	20	
14-Jun-21	Monday	841		8	12	19	12	36	34	64	63	65	62	102	75	60	64	52	26	19	9	18	6	1	34	
15-Jun-21	Tuesday	846	8	8	9	12	19	33	42	57	66	75	65	97	63	74	57	44	32	29	10	9	6	2	29	
16-Jun-21	Wednesday	831	4	7	9	12	16	32	42	69	57	75	70	85	63	71	54	50	31	26	15	9	7	3	24	
17-Jun-21	Thursday	838	7	9	9	9	18	22	46	72	63	74	55	89	62	66	50	54	42	19	17	9	8	12	26	
18-Jun-21	Friday	721	4	5	5	10	7	24	36	51	51	50	51	77	71	57	66	45	17	34	20	8	8	3	21	
21-Jun-21	Monday	843	3	4	9	8	22	20	39	78	68	70	85	94	66	80	51	40	27	20	10	9	10	3	27	
22-Jun-21	Tuesday	871	6	6	5	14	18	37	40	87	64	76	85	94	63	71	53	47	28	18	15	7	8	2	27	
23-Jun-21	Wednesday	872	8	9	7	7	15	29	50	66	68	81	76	96	63	67	59	58	28	24	9	9	9	6	28	
24-Jun-21	Thursday	851	6	7	7	9	12	28	37	71	80	68	82	82	68	68	57	58	30	16	17	10	8	4	26	
25-Jun-21	Friday	759	6	3	3	10	7	19	37	59	63	62	57	88	58	58	58	50	33	22	15	11	10	7	23	
28-Jun-21	Monday	825	2	9	4	6	17	27	35	72	57	57	88	91	63	59	75	50	34	19	12	6	7	1	34	
29-Jun-21	Tuesday	844	9	7	7	7	10	33	34	67	66	70	73	95	71	69	64	50	38	22	14	10	3	5	20	
30-Jun-21	Wednesday	847	8	8	8	9	15	26	42	61	72	67	79	79	66	69	60	55	36	25	12	14	9	6	21	

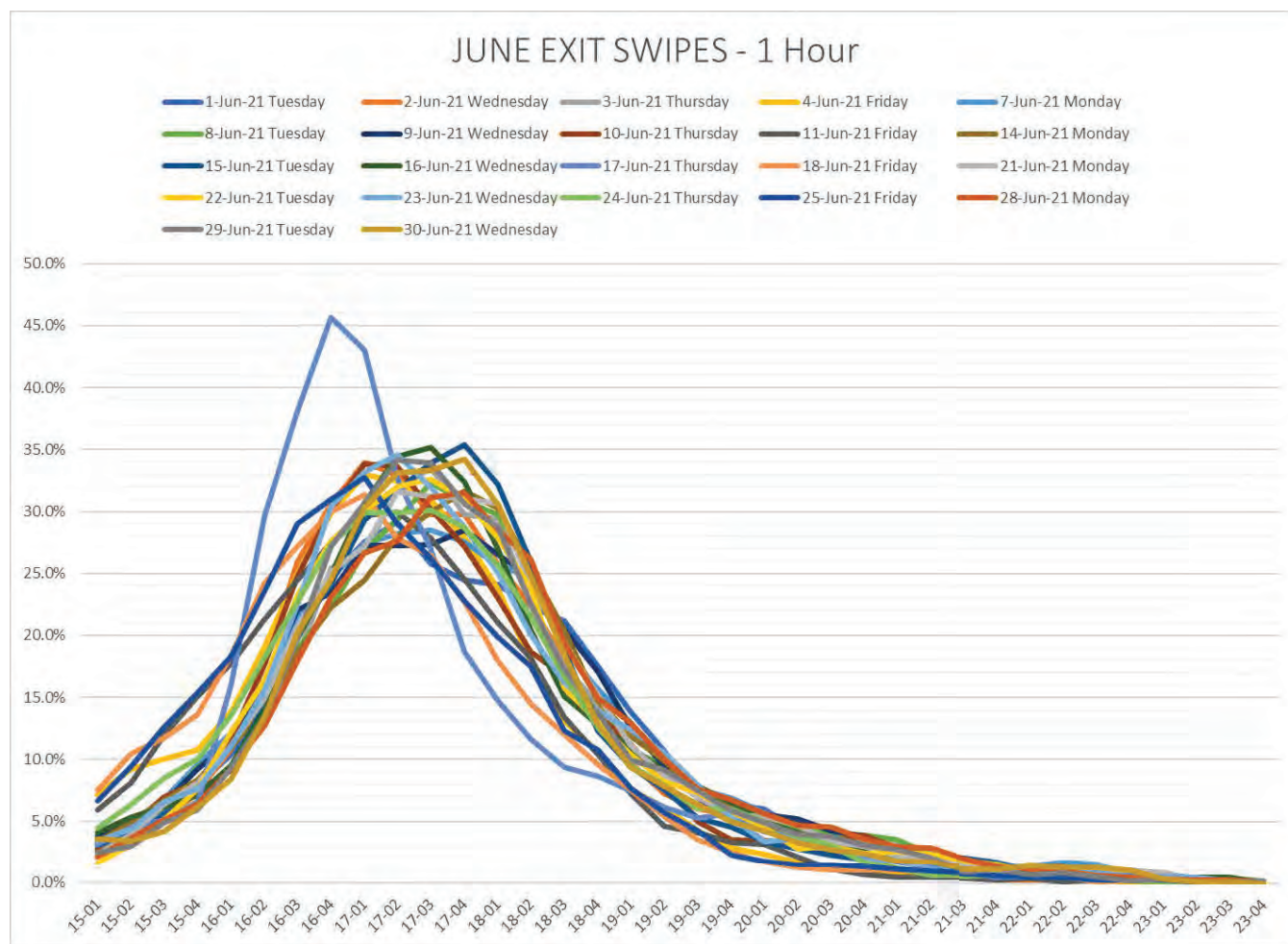
		LAST SWIPE																																									
Date	Weekday	Grand Total	12AM-6AM	6AM-12PM	12PM-3PM	15-01	15-02	15-03	15-04	16-01	16-02	16-03	16-04	17-01	17-02	17-03	17-04	18-01	18-02	18-03	18-04	19-01	19-02	19-03	19-04	20-01	20-02	20-03	20-04	21-01	21-02	21-03	21-04	22-01	22-02	22-03	22-04	23-01	23-02	23-03	23-04		
1-Jun-21 Tuesday	785	2	65	21	1	6	8	7	17	14	24	27	41	70	57	49	54	43	47	46	40	34	18	17	15	5	13	14	2	5	4	5	1				2		3				
2-Jun-21 Wednesday	811		39	45	4	4	4	5	11	20	24	33	67	87	62	60	59	61	62	27	26	15	6	12	16	11	2	4	3	9	1				1		1						
3-Jun-21 Thursday	841		52	43	7	8	4	10	12	16	18	33	60	82	79	44	81	78	47	41	23	36	22	19	6	11	8	4	6	10	8	2	2	3	1		3					1	1
4-Jun-21 Friday	780		37	49	11	18	12	15	27	24	18	39	68	70	56	63	64	58	33	30	19	20	14	6	8	5	3	2	3	1	1	1		3		1							
7-Jun-21 Monday	857		47	36	4	4	3	11	23	21	27	33	46	77	55	57	53	53	47	41	45	29	19	18	14	14	13	8	6	3	6	4			1	6	5	2					
8-Jun-21 Tuesday	885		39	36	2	4	9	10	14	22	37	25	49	56	67	65	72	82	54	55	32	30	16	23	18	8	7	11	13	5	5	8	2	1	3	1	2			2	2		
9-Jun-21 Wednesday	967		41	36	5	4	9	12	15	20	24	31	40	56	74	62	72	72	55	47	34	26	13	13	14	8	13	16	6	4	3	2	1	3		9	4						
10-Jun-21 Thursday	851		42	40	3	4	4	9	12	23	20	26	72	83	65	68	70	53	33	33	37	21	11	12	9	8	11	7	11	4	2	2	3		6	1	2	3			1		
11-Jun-21 Friday	761		44	64	6	11	11	17	23	40	35	37	50	64	58	54	52	48	33	27	30	12	10	3	10	8	4	2	2			1	2							1	1		
14-Jun-21 Monday	830		51	39	2	7	7	11	17	20	21	33	44	56	52	51	73	73	66	39	33	31	19	16	16	10	11	2	7	6	4	5	3	2	1	1							
15-Jun-21 Tuesday	840		43	41	6	5	8	7	13	18	24	22	58	67	56	63	78	86	68	38	26	26	13	14	10	7	7	4	5	3	4	7	4	2	1	2				1			
16-Jun-21 Wednesday	828	1	40	35	7	6	11	10	17	13	19	30	54	60	62	78	85	66	39	33	31	22	20	18	10	15	12	9	5	8	4	4	3	1	1	1	3	1			4		
17-Jun-21 Thursday	835		38	36	5	9	10	2	17	14	21	82	135	84	54	60	45	36	15	27	19	17	9	17	8	10	12	5	4	5	3	2		2		2		3	1				
18-Jun-21 Friday	715		36	61	5	15	17	1	10	14	20	31	40	56	74	62	72	72	55	47	34	26	13	13	14	8	13	16	6	4	3	2	1	3		9	4						
21-Jun-21 Monday	834		27	6	2	5	7	19	22	20	32	51	70	57	49	54	88	67	50	45	32	29	21	11	12	14	9	10	6	3	6	3	1		1	2	5	1					
22-Jun-21 Tuesday	865		50	33	6	3		5	19	20	22	45	55	75	60	66	72	84	46	39	37	14	23	16	18	6	10	5	3	8	5	6	1	4	2	1	1			1			
23-Jun-21 Wednesday	871		1	44	27	5	7	7	11	13	26	16	41	53	86	85	65	63	57	33	22	29	37	20	6	6	14	3	8	1	3	4	1	1	6		1		1	2		2	
24-Jun-21 Thursday	850		46	38	8	8	14	24	26	21	44	64	64	60	66	64	66	68	40	29	25	13	14	15	9	13	5	5	3	1	1		3	2	2						1		
25-Jun-21 Friday	755		41	44	4	9	19	18	25	33	40	63	74	55	53	57	53	29	31	19	14	17	8	4	3	2	4	2	3	1	2	1	2		1		2		1	1			
28-Jun-21 Monday	838		49	34	6	3	3	6	18	15	13	30	46	58	55	59	54	87	58	34	35	31	22	18	11	11	15	9	3	10	7	4	2	3	2	2	1		1		1	1	
29-Jun-21 Tuesday	843	2	46	38	7	4	6	4	11	20	15	33	45	75	76	63	74	71	50	47	22	26	21	15	15	12	7	7	11	1	4	1	2	8		2		2					
30-Jun-21 Wednesday	845		46	38	7	10	6	7	8	16	23	28	49	73	58	75	71	75	56	44	25	21	18	15	12	9	6	9	4	3	4	1	4	1	3	6	2		1				



## WALKER ANALYSIS

Walker analyzed the provided data to predict peak turnover rates. For each day, the 15-minute totals were divided by total entries or exits to develop a percentage per 15 minutes. We then look at turnover rates based upon a moving sum of four 15-minute periods. Via this technique, the peak hour was identified, independent of which 15-minute period it started in.





### RECOMMENDED DESIGN PEAK HOUR

As expected, the peak percentages were higher in the morning than in the afternoon. Based upon the Chicago data, the peak entry hour is 40%, while the peak exit hour is 35% (except for one event day). Based upon this data, the system will normally be controlled by the peak entry hour. Each of the alternatives studied have been evaluated based upon these criteria and each of the systems meet these criteria

	Entry	Exit
<b>1 Hour</b>	<b>40%</b>	<b>35%</b>
<b>Vehicles @ 400</b>	<b>160</b>	<b>140</b>
<b>Vehicles/Hr @ 7 lifts</b>	<b>23</b>	<b>20</b>
<b>Vehicles/Hr @ 8 lifts</b>	<b>20</b>	<b>18</b>

## AUTOMATED MECHANICAL PARKING ALTERNATIVES

To date, four primary alternatives have been studied. The tenant's preferred alternative is listed first, followed by the less desired alternatives.

1. Mechanical Parking – Robotic Parking: Rack and Rail blended with a puzzle system with lifts fed by valet attendants. Basis of design = Utron (comparable systems will also be bid)
2. Mechanical Parking – Robotic Parking: Automated Guided Vehicle (AGV) with lifts fed by valet attendants. Basis of design = Park Plus (comparable systems will also be bid)
3. Mechanical Parking – Vehicle Elevator Valet – Drop-off at the main floor with attendants reaching upper floors via vehicle lifts and tandem parking on the main parking floors.
4. Traditional Parking - Express Ramp - Drop-off at the main floor with attendants reaching upper floors via express ramp and tandem parking on the main parking floors.

With this submission, the Development team is submitting the Mechanical Parking – Robotic Parking: Rack and Rail blended with a puzzle system with lifts fed by valet attendants as an alternative to the previously approved Tradition Parking, self-parking concept. This system will have 315 automated spaces, 14 self-parking spaces under Building A podium and 51 self-parking spaces on Level 1, the transfer floor, for a total of 380 spaces.

**Table 1: Anticipated Parking Counts Automated Mechanical Parking  
Robotic Parking: Rack and Rail Blended with Puzzle System**

<b>Level</b>	<b>Rack &amp; Rail</b>
Building A	14
P00	63
Level 1 / P01	51
P02	63
P03	63
P04	63
P05	63
	<b>380</b>

## NUMBER OF ELEVATORS/LIFTS

This submitted concept utilizes Elevator like devices to move vehicles from floor to floor. Each “elevator” only moves one vehicle at a time, as such, the “elevator” makes one round trip per vehicle during peak entry and exit hours when traffic is essentially 1-way. During off peak hours when vehicle entries and exits are more mixed, the elevators can move more vehicles per hour, because they can move two vehicles per trip (1 inbound and 1 outbound), all be it, a slightly longer trip. This system is more efficient in moving vehicles between floors because there are parking floors above below the transfer floor. This minimizes the average travel distance verses having all of the parking floors above the transfer floor.

A traditional vehicle elevator can make the average round trip in 120 Seconds. This allows up to 30 round trips per hour. However, there are always variables over the course of an hour. As such we try to design for less than 25 vehicle movements per hour per lift. The geometry proposes 8 lifts. Thus, the proposed designs require less than 20 vehicle movements per hour per lift.

**Table 2: Number of required peak hour trips for each Lift/Elevator**

	VPH	8 "Elevators"
Inbound	160	20.0
Outbound	140	17.5

The “elevators” for the Robotic Parking Systems typically have slower vertical speeds than a valet operated freight elevator; however, they make up the increased travel time because the computer system decides which floor to park on and makes the hall calls for an elevator when retrieving.

## PROPOSED AUTOMATED MECHANICAL PARKING – ROBOTIC PARKING: RACK AND RAIL BLENDED WITH A PUZZLE SYSTEM WITH LIFTS FED BY VALET ATTENDANTS.

The floor aligned with the entry floor of the building will be utilized for drop-off and pickup and for parking the last vehicles to arrive on site. Vehicles entering the site will follow the access road and ramp up the plaza abutting the entry floor of the adjacent buildings.

Vehicles will then enter into the drop-off area, where they will be directed into one of morning entry queue lanes. (Drivers requiring accessible parking, may self-park in one of the ADA spaces or drop-offs at their option.) The non-ADA driver will exit the vehicle, leaving a key for the valet attendant. Valet attendants will then shuttle the vehicles into the vehicle elevator (transfer station). Automated sensors will verify that the vehicle is properly parked on the pallet and empty while the attendant enters the appropriate vehicle code into the control panel after exiting the vehicle.

At this point the automated system will take control and park the vehicle on one of five parking floors. One floor is located below the transfer floor and four floors are located above the transfer floor. The vehicle elevator will bring the vehicle and its pallet to a floor with available parking. When the elevator opens on an available floor, the rail system running adjacent to the elevators will remove the vehicle and its pallet from the lift and move the palate north/south to align with an available east-west row in the puzzle system. The rail system will then transfer the vehicle and its pallet to the computer designated east/west transfer row in the puzzle system and transfer the pallet from the rail system to the puzzle system.

The rail system will also rotate the vehicle, so it is orientated in the correct direction for exiting. Rotation will occur at one of three times depending upon how busy the system is:

- During off peak entry hours, the vehicle will be rotated after removing from the vehicle elevator, before transferring to the puzzle system.
- During off peak hours, in the middle of the day, the system will be programed to rotate remaining vehicles, so they are ready to exit later in the day.
- On occasion, some vehicles may not have been rotated before they are requested to be retrieved. In this case the vehicle will be rotated while exiting. After the vehicle is transferred to the rail system the vehicle will be rotated before returning to the vehicle elevator.

When the vehicle elevator returns the vehicle to the transfer floor, an attendant will remove the vehicle from the elevators and bring it to the pickup curb if the driver is already at the curb, or else park it in a self-parking spot on the transfer floor if the driver is not already at the curb.

The typical pallets are 7'6" by 18ft. The reduced width of the pallets is workable because there are no drivers in the vehicle and no turning of the vehicles in the parking area. They are only moved orthogonally so the extra width required for maneuvering in and out of a self-parking space or opening doors is not required.

All mechanical parking systems, including lifts, elevators and robotic systems will be inspected and certified as safe and in good working order by a licensed engineer or the elevator authority have jurisdiction at least once per year. The findings of the inspection will be summarized in a report, signed by the same licensed engineer or firm, or the elevator authority having jurisdiction. Report will be submitted to the planning director and the building official each year.

The parking compartment will be enclosed with a mechanical ventilation system. Thus, preventing direct exposure to wind and rain. The parking compartment will also have dehumidifiers to keep the humidity below 85% in order to control corrosion. All components of the mechanical parking system are designed to operate long term in these conditions.

## HOURS OF OPERATION

The facility is intended to be open 24 hours per day, 7 days per week. However, as typical, peak occupancy of the building is expected to be non-holiday weekdays. During remaining times, the self-parking spaces will be more than sufficient so that valet attendants are not needed during these hours.

As such, it is anticipated that valet attendants will be on site from 5am or 6am to 8pm or 9 pm on non-holiday workdays. In the evenings, all vehicles will be moved down to the transfer floor once the parking structure is more than 80% empty. Once all the remaining vehicles are parked on grade, the keys will be transferred to a lock box with one attendant remaining on site. The vehicles will be parked on grade using geometrics meeting or exceeding city standards. The remaining attendant will either provide the appropriate key to drivers exiting the building if they desire to exit themselves. Alternatively, if a driver prefers, the attendant will bring the vehicle up to the pickup curb.

Attendant staffing will vary based upon time of day and the actual use of the building. In the morning, only one or two attendants will start the day. For the Robotic parking system, it is anticipated that up to eight (8) attendants will be required during the peak entry and exit hours.

## **NOISE AND VIBRATION**

The parking floors will be enclosed and screened per city requirements. Thus, the noise associated with valet attendants moving or parking vehicles will be within the normal range of comparable facilities in the city.

For the vehicle lifts and robotic parking requirement, the machines will be within enclosed parking compartments or elevator machine rooms. Thus, noise at the property line will be minimal. Use of audio alarms will be minimized.

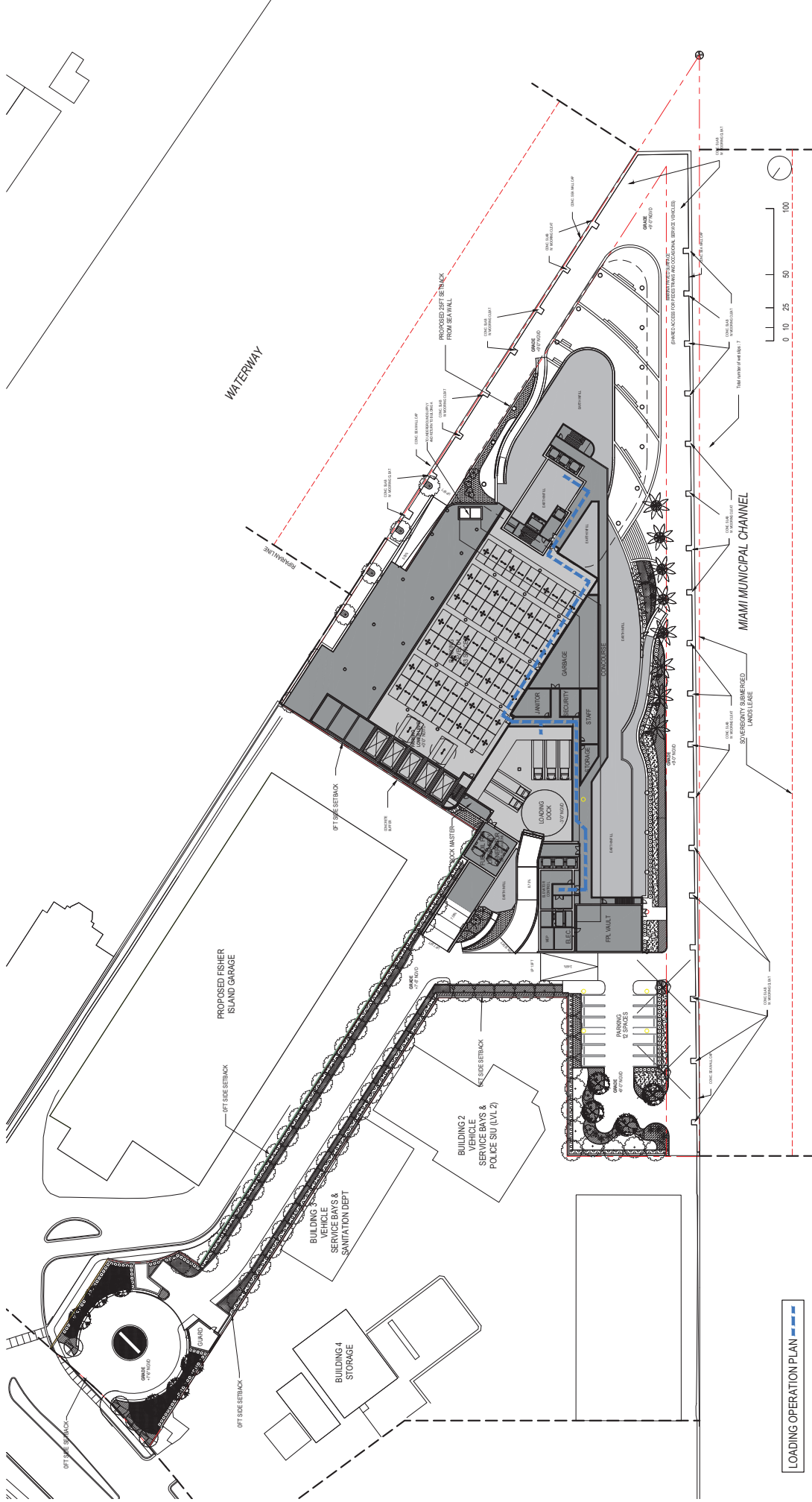
Noise and vibration from the vehicle elevators and robotic parking systems will not be plainly audible or felt by individuals standing outside an apartment or hotel unit at adjacent or nearby properties. In addition, noise and vibration barriers will be utilized to ensure that surrounding walls decrease sound and vibration emissions outside of the parking garage.

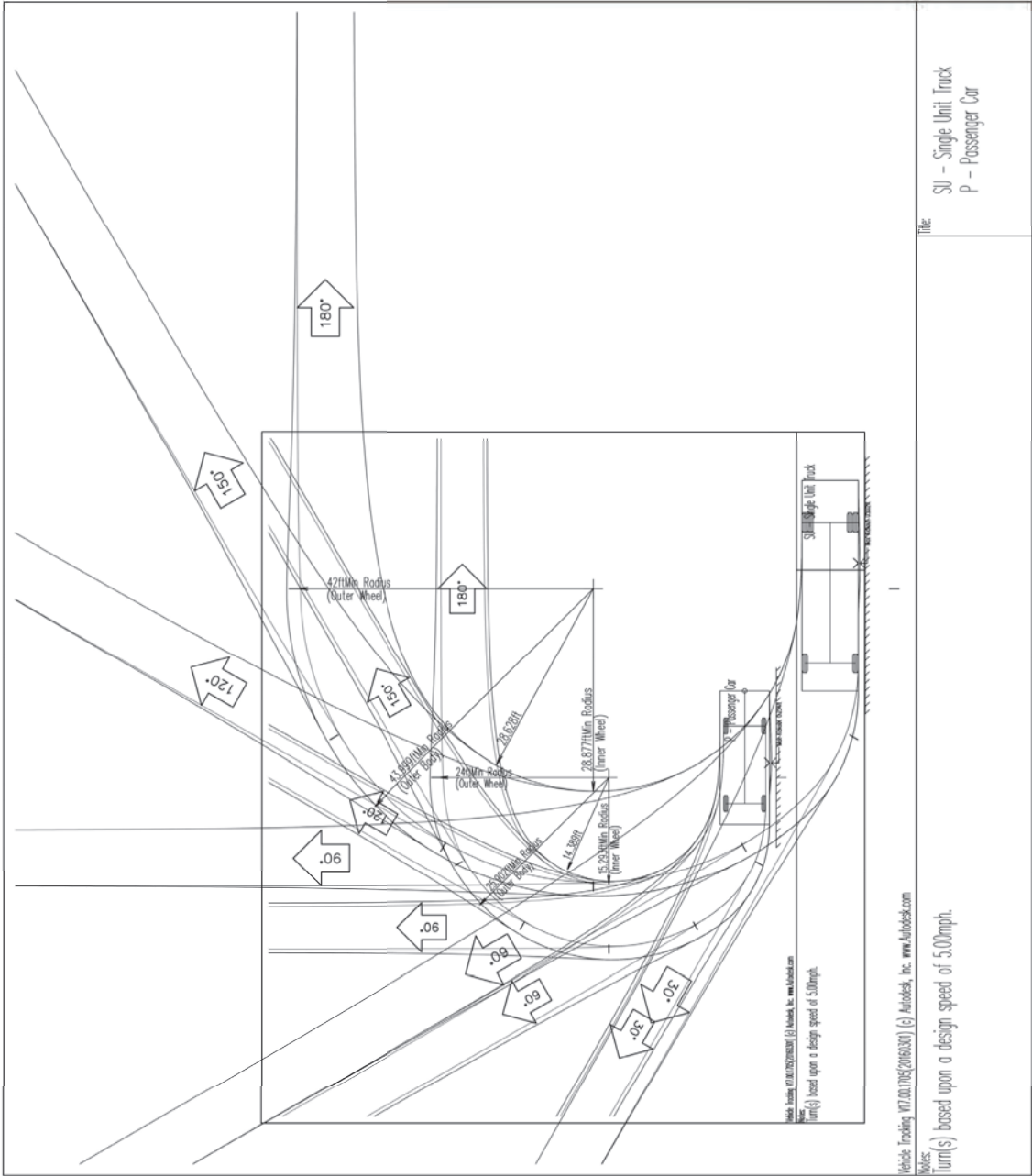
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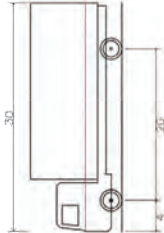


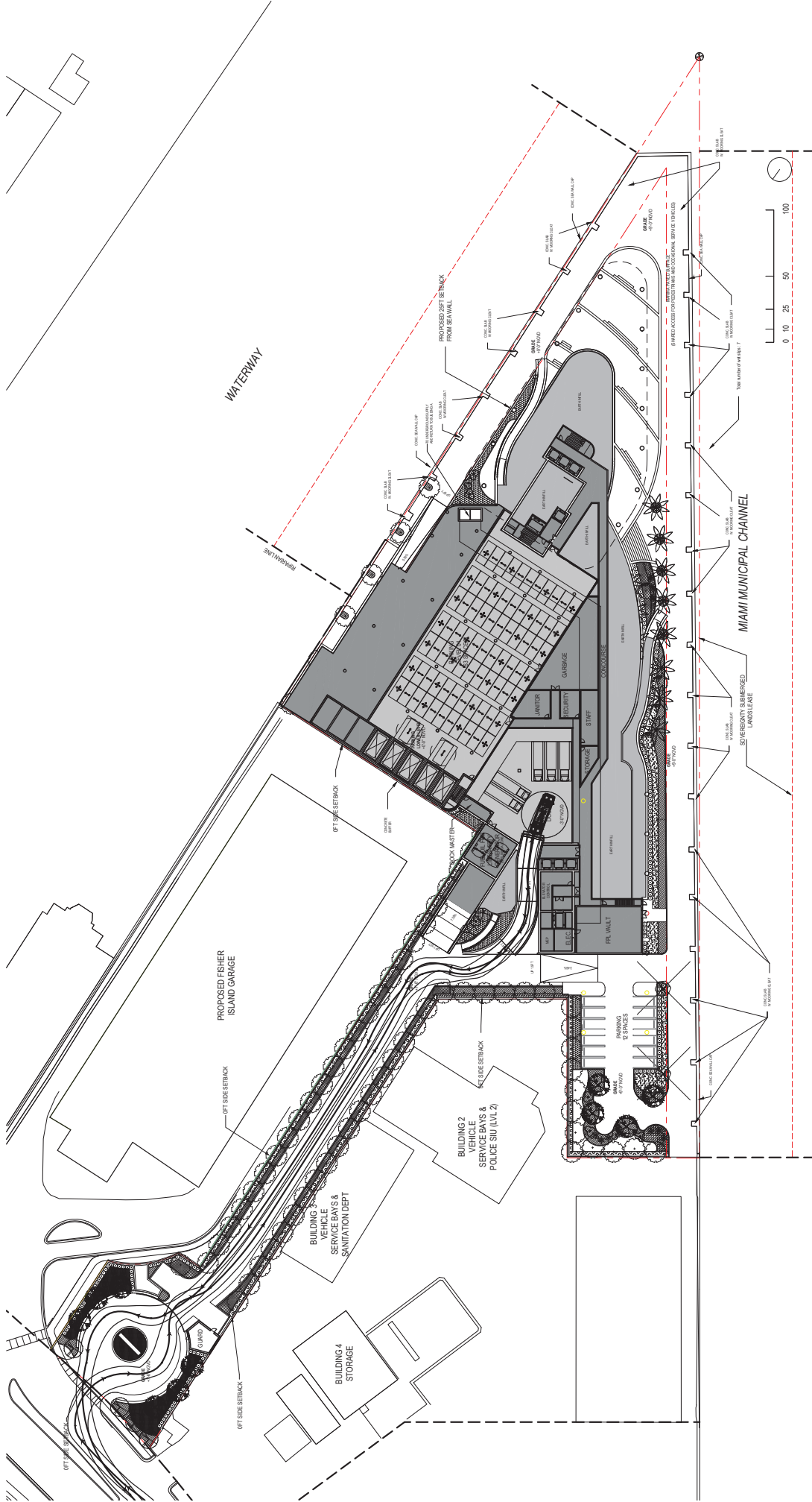


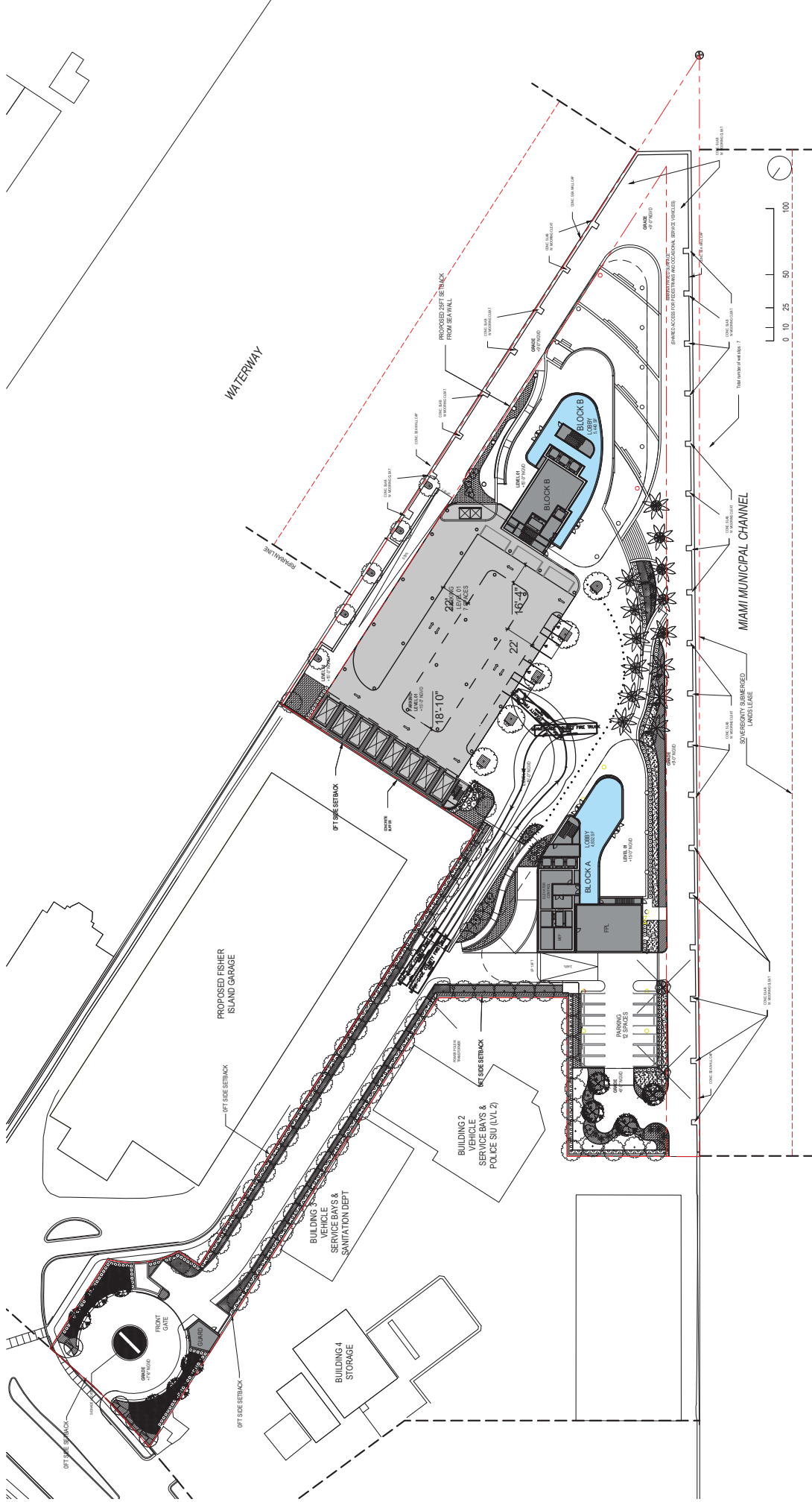




SU - Single Unit Truck  
 Overall Length 30.000ft  
 Overall Width 8.000ft  
 Overall Body Height 11.36ft  
 Min Body Ground Clearance 8.000ft  
 Track Width 6.000ft  
 Lock-to-lock time 2.00s  
 Curb to Curb Turning Radius 42.000ft







**ARQUITECTONICA**

2900 Oak Avenue, Miami, FL 33133  
T 305.372.1812 F 305.372.1175

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**DRAFT PB FIRST SUBMITTAL**  
**120 MACARTHUR CAUSEWAY**  
**MIAMI BEACH, FL**

**MANEUVERING DIAGRAM**  
**FIRE TRUCK**

SCALE: 1"=70'-0"

DATE:  
11/08/2021

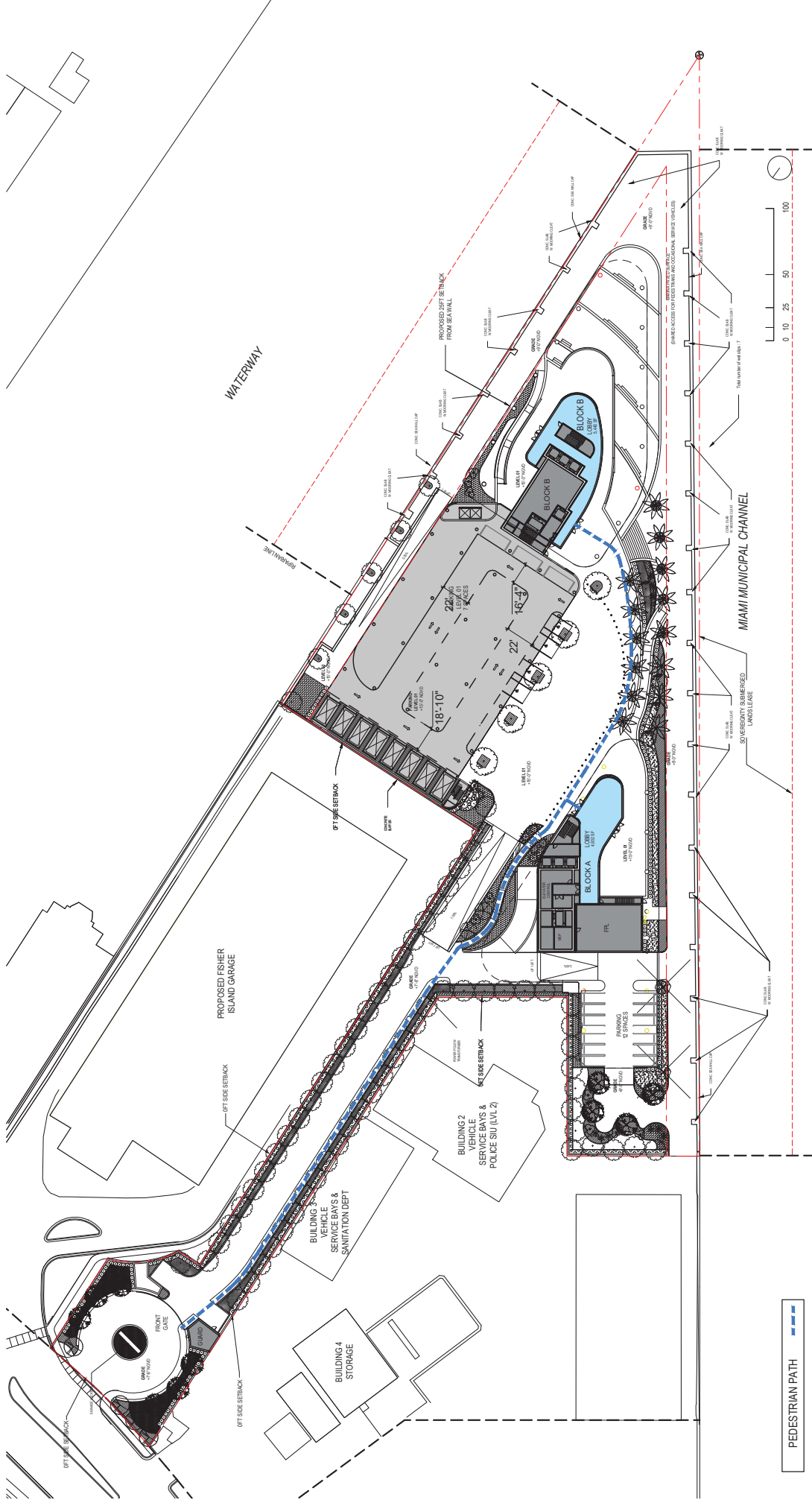
**A1-26**





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## DRAFT PB FIRST SUBMITTAL

120 MACARTHUR CAUSEWAY

MIAMI BEACH, FL

## PEDESTRIAN PATH PLAN

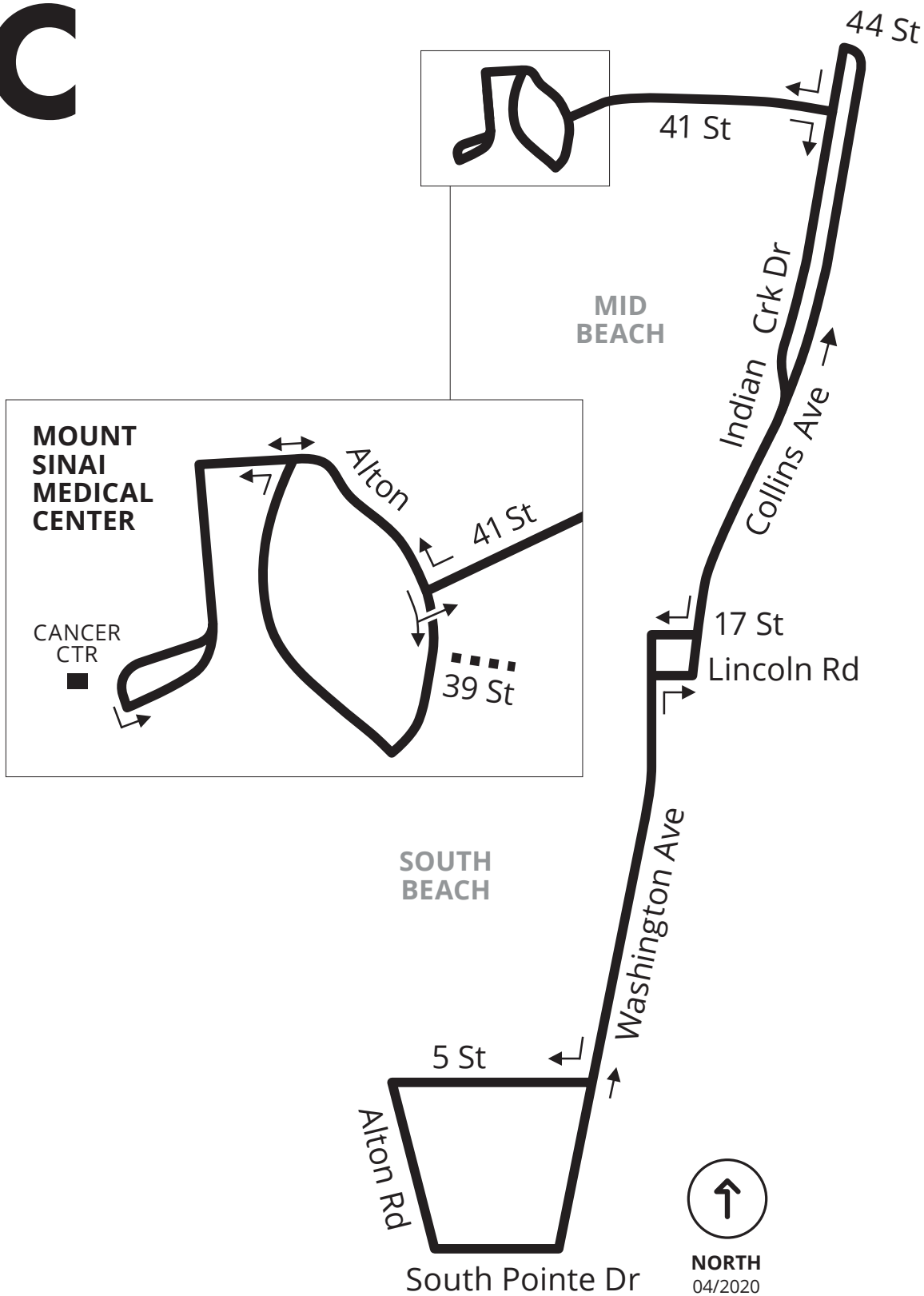
DATE:  
11/08/2021

A1-20

SCALE: 1"=70'-0"



C



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miamidade.gov/transit



311 or 305.468.5900 TTY/Fla Relay: 711





WEEKDAYS / DIAS LABORABLES / LASEMÈN																																
NORTHBOUND / RUMBO NORTE / DIRIKSYON NÒ		MORNING / MAÑANA / MATEN										AFTERNOON & EVENING / TARDE Y NOCHE / APREMIDI, CHAK ASWÈ																				
		6:11	6:41	7:11	7:41	8:11	8:41	9:11	9:41	10:11	10:41	11:11	11:41	12:11	12:41	1:11	1:41	2:11	2:41	3:11	3:41	4:11	4:41	5:11	5:41	6:11	6:41	7:11	7:41	8:26	9:11	9:56
	Alton Rd & 2 St	6:28	6:58	7:29	7:59	8:29	8:59	9:31	10:01	10:31	11:01	11:31	12:01	12:31	1:01	1:31	2:01	2:31	3:01	3:31	4:01	4:31	5:01	5:31	6:01	6:31	7:01	7:29	7:59	8:44	9:29	10:14
	Lincoln Rd & James Ave	6:38	7:09	7:40	8:11	8:41	9:13	9:45	10:15	10:45	11:15	11:45	12:15	12:45	1:15	1:45	2:15	2:45	3:15	3:45	4:15	4:45	5:15	5:45	6:15	6:45	7:11	7:39	8:09	8:54	9:39	10:25
	Indian Creek Dr & 43 St	6:48	7:20	7:51	8:22	8:52	9:25	9:57	10:27	10:57	11:27	11:57	12:27	12:57	1:27	1:57	2:27	2:57	3:27	3:57	4:28	4:58	5:28	5:58	6:28	6:58	7:22	7:50	8:20	9:05	9:50	10:34
	Mt Sinai Hospital	6:51	7:23	7:54	8:25	8:55	9:28	10:00	10:30	11:00	11:30	12:00	12:30	1:00	1:30	2:00	2:30	3:00	3:30	4:00	4:31	5:01	5:31	6:01	6:31	-	7:25	-	8:23	9:08	9:53	-
	Alton Rd & 39 St																															
SOUTHBOUND / RUMBO SUR / DIRIKSYON SID		MORNING / MAÑANA / MATEN										AFTERNOON & EVENING / TARDE Y NOCHE / APREMIDI, CHAK ASWÈ																				
		-	-	7:05	7:34	-	8:29	8:57	9:27	9:57	10:27	10:57	11:27	11:57	12:27	12:57	1:27	1:57	2:27	2:57	3:27	3:56	4:25	4:55	5:25	5:55	6:25	7:03	7:48	8:33	9:18	10:06
	Alton Rd & 39 St	6:12	6:41	7:08	7:37	8:05	8:32	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	1:00	1:30	2:00	2:30	3:00	3:30	3:59	4:29	4:59	5:29	5:59	6:29	7:06	7:51	8:36	9:21	10:09
	Mt Sinai Hospital	6:20	6:49	7:18	7:47	8:16	8:43	9:12	9:42	10:12	10:42	11:12	11:42	12:12	12:42	1:12	1:42	2:12	2:42	3:12	3:42	4:11	4:41	5:11	5:41	6:11	6:41	7:16	8:01	8:46	9:31	10:18
	Indian Creek Dr & 40 St	6:28	6:57	7:27	7:56	8:26	8:53	9:23	9:53	10:23	10:53	11:23	11:53	12:23	12:53	1:23	1:53	2:23	2:53	3:23	3:53	4:23	4:53	5:23	5:53	6:23	6:53	7:26	8:11	8:56	9:41	10:27
	Washington Ave & Lincoln Rd	6:40	7:10	7:40	8:10	8:40	9:10	9:40	10:10	10:40	11:10	11:40	12:10	12:40	1:10	1:40	2:10	2:40	3:10	3:40	4:10	4:40	5:10	5:40	6:10	6:40	7:10	7:40	8:25	9:10	9:55	10:40
	Alton Rd & 2 St																															

SATURDAY / SÁBADO / SAMDI																																
NORTHBOUND / RUMBO NORTE / DIREKSYON NÒ		MORNING / MAÑANA / MATEN										AFTERNOON & EVENING / TARDE Y NOCHE / APREMIDI, CHAK ASWÈ																				
		6:24	6:59	7:34	8:09	8:44	9:19	9:54	10:29	11:04	11:39	12:14	12:49	1:24	1:59	2:34	3:09	3:44	4:19	4:54	5:29	6:04	6:39	7:14	7:49	8:24	8:59	9:34	10:09	10:42	11:15	
	Alton Rd & 2 St	6:41	7:17	7:52	8:27	9:04	9:39	10:14	10:49	11:24	11:59	12:34	1:09	1:44	2:19	2:54	3:29	4:04	4:39	5:14	5:49	6:24	6:59	7:32	8:07	8:42	9:17	9:52	10:26	11:00	11:33	
	Lincoln Rd & James Ave	6:49	7:25	8:02	8:37	9:16	9:51	10:26	11:01	11:36	12:11	12:46	1:21	1:56	2:31	3:06	3:41	4:14	4:49	5:24	5:59	6:34	7:09	7:40	8:15	8:50	9:25	10:00	10:33	11:07	11:40	
	Indian Creek Dr & 43 St	6:58	7:35	8:13	8:48	9:28	10:03	10:38	11:13	11:48	12:23	12:58	1:33	2:08	2:43	3:18	3:53	4:26	5:01	5:36	6:11	6:46	7:19	7:50	8:25	9:00	9:35	10:09	10:42	11:15	11:48	
	Mt Sinai Hospital	7:00	7:37	8:15	8:50	9:30	10:05	10:40	11:15	11:50	12:25	1:00	1:35	2:10	2:45	3:20	3:55	4:28	5:03	5:38	6:13	6:48	7:21	7:52	8:27	9:02	9:37	-	-	-	-	
	Alton Rd & 39 St																															
SOUTHBOUND / RUMBO SUR / DIREKSYON SID		MORNING / MAÑANA / MATEN										AFTERNOON & EVENING / TARDE Y NOCHE / APREMIDI, CHAK ASWÈ																				
		-	-	-	7:32	8:06	8:38	9:11	9:46	10:21	10:56	11:31	12:06	12:41	1:16	1:51	2:26	3:01	3:36	4:11	4:46	5:21	5:56	6:31	7:11	7:46	8:21	8:56	9:31	10:09	10:43	
	Alton Rd & 39 St	-	-	-	7:35	8:09	8:41	9:14	9:49	10:24	10:59	11:34	12:09	12:44	1:19	1:54	2:29	3:04	3:39	4:14	4:49	5:24	5:59	6:34	7:14	7:49	8:24	8:59	9:34	10:12	10:46	11:20
	Mt Sinai Hospital	5:55	6:30	7:00	7:35	8:09	8:41	9:14	9:49	10:24	10:59	11:34	12:09	12:44	1:19	1:54	2:29	3:04	3:39	4:14	4:49	5:24	5:59	6:34	7:14	7:49	8:24	8:59	9:34	10:12	10:46	11:20
	Indian Creek Dr & 40 St	6:02	6:37	7:09	7:44	8:18	8:50	9:25	10:00	10:35	11:10	11:45	12:20	12:55	1:30	2:05	2:40	3:15	3:50	4:25	5:00	5:35	6:10	6:45	7:24	7:59	8:34	9:09	9:44	10:21	10:55	11:29
	Washington Ave & Lincoln Rd	6:09	6:44	7:18	7:53	8:28	9:01	9:36	10:11	10:46	11:21	11:56	12:31	1:06	1:41	2:16	2:51	3:26	4:01	4:36	5:11	5:46	6:21	6:56	7:33	8:08	8:43	9:18	9:53	10:29	11:03	11:37
	Alton Rd & 2 St	6:23	6:58	7:33	8:08	8:43	9:18	9:53	10:28	11:03	11:38	12:13	12:48	1:23	1:58	2:33	3:08	3:43	4:18	4:53	5:28	6:03	6:38	7:13	7:48	8:23	8:58	9:33	10:08	10:43	11:17	11:51

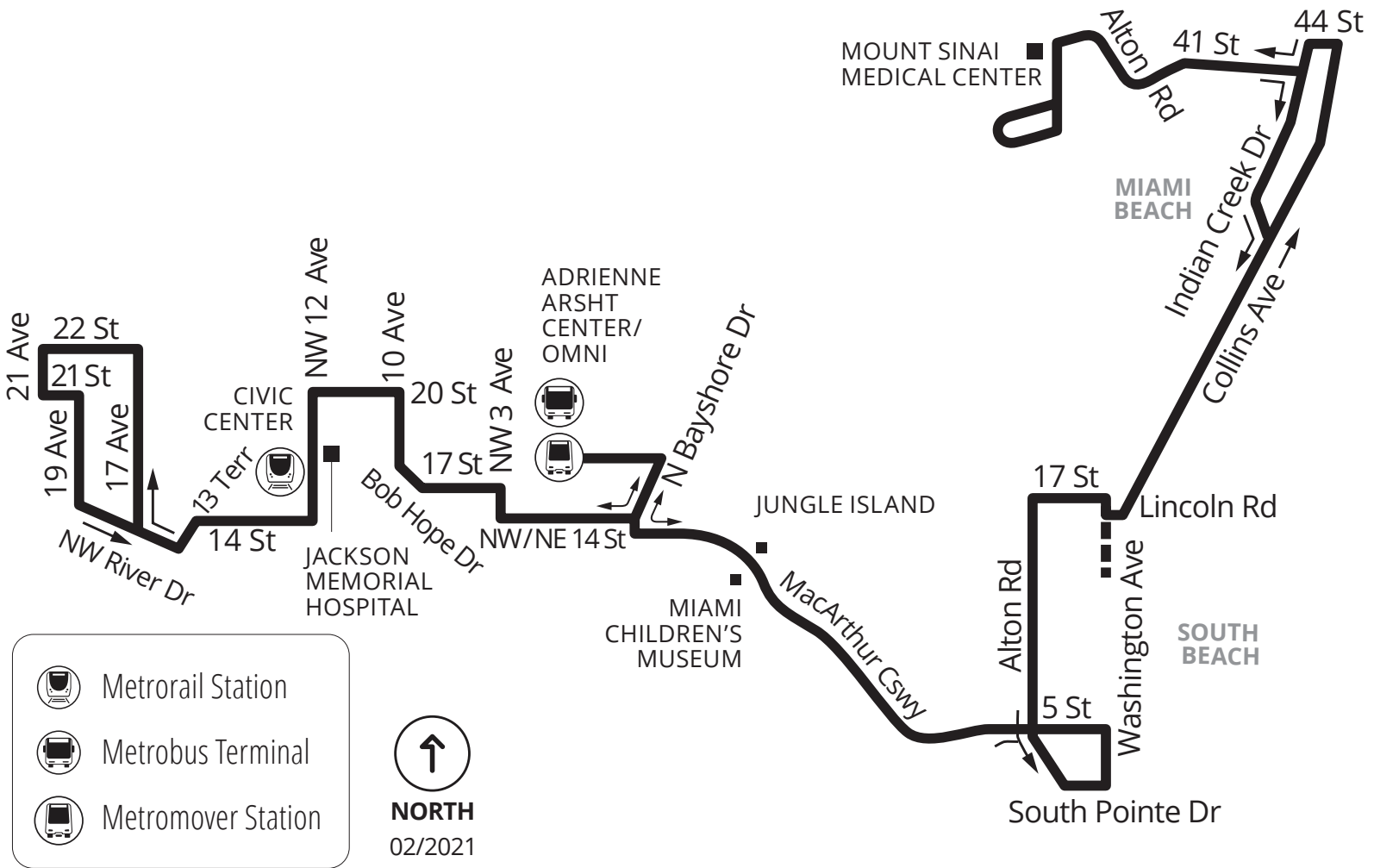
SUNDAY / DOMINGO / DIMANCH																							
NORTHBOUND / RUMBO NORTE / DIREKSYON NÒ		MORNING / MAÑANA / MATEN												AFTERNOON & EVENING / TARDE Y NOCHE / APREMIDI, CHAK ASWÈ									
		6:22	7:07	7:52	8:37	9:22	10:07	10:52	11:37	12:22	1:07	1:52	2:37	3:22	4:07	4:52	5:37	6:22	7:07	7:52	8:37	9:22	
	Alton Rd & 2 St	6:34	7:19	8:04	8:49	9:35	10:20	11:05	11:50	12:35	1:20	2:05	2:50	3:35	4:20	5:05	5:50	6:35	7:19	8:04	8:49	9:34	
	Lincoln Rd & James Ave	6:43	7:28	8:13	8:58	9:45	10:30	11:15	12:00	12:45	1:30	2:15	3:00	3:45	4:30	5:15	6:00	6:43	7:27	8:12	8:57	9:41	
	Indian Creek Dr & 43 St	6:52	7:37	8:22	9:08	9:55	10:40	11:25	12:10	12:55	1:40	2:25	3:10	3:55	4:40	5:25	6:10	6:52	7:36	8:21	9:06	9:49	
	Mt Sinai Hospital	6:54	7:39	8:24	9:10	9:57	10:42	11:27	12:12	12:57	1:42	2:27	3:12	3:57	4:42	5:27	6:12	6:54	7:38	8:23	9:08	-	
	Alton Rd & 39 St																						
SOUTHBOUND / RUMBO SUR / DIREKSYON SID		MORNING / MAÑANA / MATEN												AFTERNOON & EVENING / TARDE Y NOCHE / APREMIDI, CHAK ASWÈ									
		-	-	7:17	8:02	8:45	9:29	10:14	10:59	11:44	12:29	1:14	1:59	2:44	3:29	4:14	4:59	5:44	6:32	7:17	8:02	8:47	9:37
	Alton Rd & 39 St	5:51	6:35	7:20	8:05	8:48	9:32	10:17	11:02	11:47	12:32	1:17	2:02	2:47	3:32	4:17	5:02	5:47	6:35	7:20	8:05	8:50	9:40
	Mt Sinai Hospital	5:58	6:43	7:28	8:13	8:56	9:41	10:26	11:11	11:56	12:41	1:26	2:11	2:56	3:41	4:26	5:11	5:56	6:43	7:28	8:13	8:58	9:47
	Indian Creek Dr & 40 St	6:07	6:52	7:37	8:22	9:06	9:51	10:36	11:21	12:06	12:51	1:36	2:21	3:06	3:51	4:36	5:21	6:06	6:52	7:37	8:22	9:07	9:53
	Washington Ave & Lincoln Rd	6:21	7:06	7:51	8:36	9:21	10:06	10:51	11:36	12:21	1:06	1:51	2:36	3:21	4:06	4:51	5:36	6:21	7:06	7:51	8:36	9:21	10:06
	Alton Rd & 2 St																						

Scheduled times are approximate. Actual arrival and departure times may vary depending on traffic and road conditions. Las horas publicadas son aproximadas, pues dependen del tráfico y otras condiciones de las vías. Ore yo apwoksimatif. Vre le bis yo ap rive oswa deplase ka varye selon kondisyon siklasyon sou wout yo.





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311 or 305.468.5900 TTY/Fla Relay: 711



WEEKDAYS / DIAS LABORABLES / JOU LASEMÈN

EASTBOUND		MORNING / MAÑANA / MATEN										AM		PM										AFTERNOON AND EVENING / TARDE Y NOCHE / APREMIDI / AKASWÈ									
RUMBO ESTE / DIREKSYON IS		5:42	6:20	6:55	7:45	8:30	9:15	9:55	10:55	11:55	12:55	1:55	2:55	3:40	4:30	5:15	6:00	6:45	7:35	8:35	9:35												
	NW 21 Ave & 22 St	5:48	6:27	7:03	7:53	8:38	9:23	10:03	11:03	12:03	1:03	2:03	3:03	3:48	4:38	5:23	6:08	6:53	7:42	8:42	9:42												
	NW 12 Ave & 15 St																																
	Omni Terminal / Arisht Metromover	5:58	6:39	7:16	8:06	8:51	9:37	10:17	11:17	12:17	1:17	2:17	3:17	4:02	4:52	5:37	6:22	7:07	7:55	8:55	9:55												
	Alton Rd & 2 St	6:08	6:49	7:27	8:17	9:02	9:48	10:28	11:28	12:28	1:28	2:28	3:28	4:14	5:04	5:49	6:34	7:18	8:06	9:06	10:06												
	5 St & Lenox Ave	6:13	6:54	7:33	8:23	9:08	9:54	10:34	11:34	12:34	1:34	2:34	3:34	4:20	5:10	5:55	6:40	7:24	8:12	9:12	10:11												
	17 St & Lenox Ave	6:21	7:04	7:43	8:33	9:18	10:04	10:44	11:44	12:44	1:44	2:44	3:44	4:30	5:20	6:05	6:50	7:32	8:20	9:20	10:19												
	Lincoln Rd & James Ave	6:26	7:10	7:49	8:39	9:25	10:11	10:51	11:51	12:51	1:51	2:51	3:51	4:37	5:27	6:12	6:57	7:38	8:26	9:26	10:24												
	Indian Creek Dr & 43 St	6:35	7:20	7:59	8:51	9:37	10:23	11:03	12:03	1:03	2:03	3:03	4:03	4:49	5:39	6:24	7:09	7:49	8:37	9:37	10:33												
	41 St & Meridian Ave	6:42	7:27	8:06	8:58	9:44	10:30	11:10	12:10	1:10	2:10	3:10	4:11	4:57	5:47	6:32	7:16	7:56	8:44	9:44	10:39												
	41 St & Alton Rd	6:43	7:29	8:08	9:00	9:46	10:32	11:12	12:12	1:12	2:12	3:12	4:13	4:59	5:49	6:34	7:17	7:57	8:45	9:45	10:40												
	Mt Sinai Hospital	6:45	7:31	8:10	9:02	9:48	10:34	11:14	12:14	1:14	2:14	3:14	4:15	5:01	5:51	6:36	7:19	7:59	8:47	9:47	10:42												
	Alton Rd & 39 St	6:47	7:33	8:12	9:04	9:50	-	-	-	-	-	-	4:17	5:03	5:53	6:38	-	8:01	8:49	-	-												

WESTBOUND		MORNING / MAÑANA / MATEN										AM	PM										AFTERNOON AND EVENING / TARDE Y NOCHE / APREMIDI AK ASWÈ																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
RUMBO OESTE / DIREKSYON IWÈS		-	-	7:02	7:43	8:25	9:17	10:13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Scheduled times are approximate. Actual arrival and departure times may vary depending on traffic and road conditions.

Las horas publicadas son aproximadas; pues dependen del tráfico y otras condiciones de las vías. | Ore yo apwoksimatif. Vre le bis yo ap nve oswa depiase ka varye selon kondisyon sikilasyon sou wout yo.





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SATURDAY / SÁBADO / SAMDI

EASTBOUND		MORNING / MAÑANA / MATEN				PM				AFTERNOON AND EVENING / TARDE Y NOCHE / APREMIDI AKASWÈ															
RUMBO ESTE / DIREKSYON IS		5:53	7:25	8:25	9:25	10:25	11:25	12:25	1:25	2:25	3:25	4:25	5:25	6:25	7:25	8:15	9:15	10:15							
	NW 21 Ave & 22 St	5:59	7:32	8:32	9:33	10:33	11:33	12:33	1:33	2:33	3:33	4:33	5:33	6:33	7:32	8:22	9:22	10:21							
	Omni Terminal / Arshnt Metromover	6:09	7:43	8:43	9:45	10:45	11:45	12:45	1:45	2:45	3:45	4:45	5:45	6:45	7:43	8:33	9:33	10:31							
	Alton Rd & 2 St	6:19	7:53	8:53	9:57	10:57	11:57	12:57	1:57	2:57	3:57	4:57	5:57	6:57	7:53	8:43	9:43	10:41							
	5 St & Lenox Ave	6:24	7:59	8:59	10:03	11:03	12:03	1:03	2:03	3:03	4:03	5:03	6:03	7:03	7:59	8:49	9:49	10:46							
	17 St & Lenox Ave	6:32	8:08	9:08	10:12	11:12	12:12	1:12	2:12	3:12	4:12	5:12	6:12	7:11	8:07	8:57	9:57	10:53							
	Lincoln Rd & James Ave	6:37	8:14	9:15	10:19	11:19	12:19	1:19	2:19	3:19	4:19	5:19	6:19	7:17	8:13	9:03	10:03	10:58							
	Indian Creek Dr & 43 St	6:45	8:24	9:27	10:31	11:31	12:31	1:31	2:31	3:31	4:30	5:30	6:30	7:27	8:23	9:13	10:11	11:06							
	41 St & Meridian Ave	6:51	8:31	9:35	10:39	11:39	12:39	1:39	2:39	3:39	4:37	5:37	6:37	7:34	8:30	9:20	10:17	11:12							
	41 St & Alton Rd	6:52	8:33	9:37	10:41	11:41	12:41	1:41	2:41	3:41	4:39	5:39	6:39	7:35	8:31	9:21	10:18	11:13							
	Mt Sinai Hospital	6:54	8:35	9:39	10:43	11:43	12:43	1:43	2:43	3:43	4:41	5:41	6:41	7:37	8:33	9:23	10:20	11:15							
	Alton Rd & 39 St	6:56	8:37	9:41	10:45	11:45	12:45	1:45	-	3:45	4:43	5:43	6:43	7:39	8:35	-	-	-							
WESTBOUND		MORNING / MAÑANA / MATEN						AM		PM								AFTERNOON AND EVENING / TARDE Y NOCHE / APREMIDI AKASWÈ							
RUMBO OESTE / DIREKSYON IWÈS		-	7:07	-	8:57	9:57	10:57	11:57	12:57	1:57	-	3:57	4:57	5:57	6:57	7:57	8:57	9:57							
	Alton Rd & 39 St	6:10	7:10	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	9:00							
	Mt Sinai Hospital	6:12	7:12	8:02	9:03	10:03	11:03	12:03	1:03	2:03	3:03	4:02	5:02	6:02	7:02	8:02	9:02	9:02							
	41 St & Alton Rd	6:13	7:14	8:04	9:05	10:05	11:05	12:05	1:05	2:05	3:05	4:04	5:04	6:04	7:04	8:04	9:04	9:04							
	41 St & Meridian Ave	6:17	7:19	8:09	9:11	10:11	11:11	12:11	1:11	2:11	3:11	4:10	5:10	6:10	7:10	8:10	9:10	9:10							
	Indian Creek Dr & 40 St	6:24	7:28	8:19	9:22	10:22	11:22	12:22	1:22	2:22	3:22	4:21	5:21	6:21	7:20	8:20	9:20	9:20							
	Lincoln Rd & Washington Ave	6:29	7:33	8:24	9:28	10:28	11:28	12:28	1:28	2:28	3:28	4:27	5:27	6:27	7:25	8:25	9:25	9:25							
	Alton Rd & Lincoln Rd	6:36	7:41	8:33	9:38	10:38	11:38	12:38	1:38	2:38	3:38	4:37	5:37	6:37	7:34	8:34	9:34	9:34							
	Alton Rd & 2 St	6:41	7:47	8:39	9:44	10:44	11:44	12:44	1:44	2:44	3:44	4:43	5:43	6:43	7:40	8:40	9:40	9:40							
	5 St & Lenox Ave	6:48	7:55	8:47	9:54	10:54	11:54	12:54	1:54	2:54	3:54	4:53	5:53	6:53	7:48	8:48	9:48	9:48							
	Omni Terminal / Arshnt Metromover	6:59	8:07	8:59	10:06	11:06	12:06	1:06	2:06	3:06	4:06	5:05	6:05	7:05	7:59	8:59	9:59	9:59							
	NW 12 Ave & 16 St	7:09	8:17	9:09	10:16	11:16	12:16	1:16	2:16	3:16	4:16	5:15	6:15	7:14	8:08	9:08	10:08	10:08							


Scheduled times are approximate. Actual arrival and departure times may vary depending on traffic and road conditions. Las horas publicadas son aproximadas, pues dependen del tráfico y otras condiciones de las vías. | Ore yo apwoksimatif. Vre le bis yo ap nve oswa depiase ka varye selon kondisyon sikilasyon sou wout yo.









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SUNDAY / DOMINGO / DIMANCH

EASTBOUND		MORNING / MAÑANA / MATEN												AM	PM AFTERNOON AND EVENING / TARDE Y NOCHE / APREMIDI AKASWÈ											
RUMBO ESTE / DIREKSYON IS		5:54	7:29	8:25	9:20	10:20	11:20	12:20	1:20	2:20	3:20	4:20	5:35		12:20	1:28	2:28	3:28	4:28	5:43						
	NW 21 Ave & 22 St	6:01	7:36	8:32	9:28	10:28	11:28	12:28	1:28	2:28	3:28	4:28	5:43													
	Omni Terminal / Arshnt Metromover	6:10	7:45	8:41	9:39	10:39	11:39	12:39	1:39	2:39	3:39	4:39	5:54													
		6:20	7:55	8:51	9:49	10:49	11:50	12:50	1:50	2:50	3:50	4:50	6:05													
		6:25	8:00	8:56	9:55	10:55	11:56	12:56	1:56	2:56	3:56	4:56	6:11													
		6:33	8:08	9:05	10:04	11:04	12:05	1:05	2:05	3:05	4:05	5:05	6:20													
	Lincoln Rd & James Ave	6:38	8:13	9:11	10:10	11:10	12:11	1:11	2:11	3:11	4:11	5:11	6:26													
	Indian Creek Dr & 43 St	6:47	8:22	9:21	10:20	11:21	12:22	1:22	2:22	3:22	4:22	5:22	6:37													
	41 St & Meridian Ave	6:53	8:28	9:28	10:27	11:28	12:29	1:29	2:29	3:29	4:29	5:29	6:44													
	41 St & Alton Rd	6:54	8:29	9:30	10:29	11:30	12:31	1:31	2:31	3:31	4:31	5:31	6:46													
	Mt Sinai Hospital	6:56	8:31	9:32	10:31	11:32	12:33	1:33	2:33	3:33	4:33	5:33	6:48													
	Alton Rd & 39 St	6:58	8:33	9:34	10:33	11:34	12:35	1:35	2:35	3:35	4:35	5:35	-													

WESTBOUND		MORNING / MAÑANA / MATEN						AM	PM						AFTERNOON AND EVENING TARDE Y NOCHE / APREMIDI AK ASWÈ			
RUMBO OESTE / DIREKSYON IWÈS		-	7:07	-	8:57	9:57	10:57	11:57	12:57	1:57	2:57	3:57	4:57	5:57				
	Alton Rd & 39 St	6:10	7:10	8:10	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00				
	Mt Sinai Hospital	6:12	7:12	8:12	9:02	10:02	11:02	12:02	1:02	2:02	3:02	4:02	5:02	6:02				
	41 St & Alton Rd	6:13	7:13	8:13	9:03	10:03	11:03	12:03	1:03	2:03	3:03	4:03	5:03	6:03				
	41 St & Meridian Ave	6:18	7:18	8:18	9:09	10:09	11:09	12:09	1:09	2:09	3:09	4:09	5:09	6:09				
	Indian Creek Dr & 40 St	6:27	7:27	8:27	9:19	10:19	11:19	12:19	1:19	2:19	3:19	4:19	5:19	6:19				
	Lincoln Rd & Washington Ave	6:31	7:31	8:31	9:24	10:24	11:24	12:24	1:24	2:24	3:24	4:24	5:24	6:24				
	Alton Rd & Lincoln Rd	6:38	7:38	8:38	9:33	10:33	11:34	12:34	1:34	2:34	3:34	4:34	5:34	6:34				
	Alton Rd & 2 St	6:43	7:43	8:43	9:39	10:39	11:40	12:40	1:40	2:40	3:40	4:40	5:40	6:40				
	5 St & Lenox Ave	6:50	7:50	8:50	9:48	10:48	11:49	12:49	1:49	2:49	3:49	4:49	5:49	6:49				
	Omni Terminal / Arshnt Metromover	7:01	8:01	9:02	10:00	11:00	12:01	1:01	2:01	3:01	4:01	5:01	6:01	7:01				
	NW 12 Ave & 16 St	7:11	8:11	9:12	10:10	11:10	12:11	1:11	2:11	3:11	4:11	5:11	6:11	7:10				
	NW 21 Ave & 22 St																	

Scheduled times are approximate. Actual arrival and departure times may vary depending on traffic and road conditions.

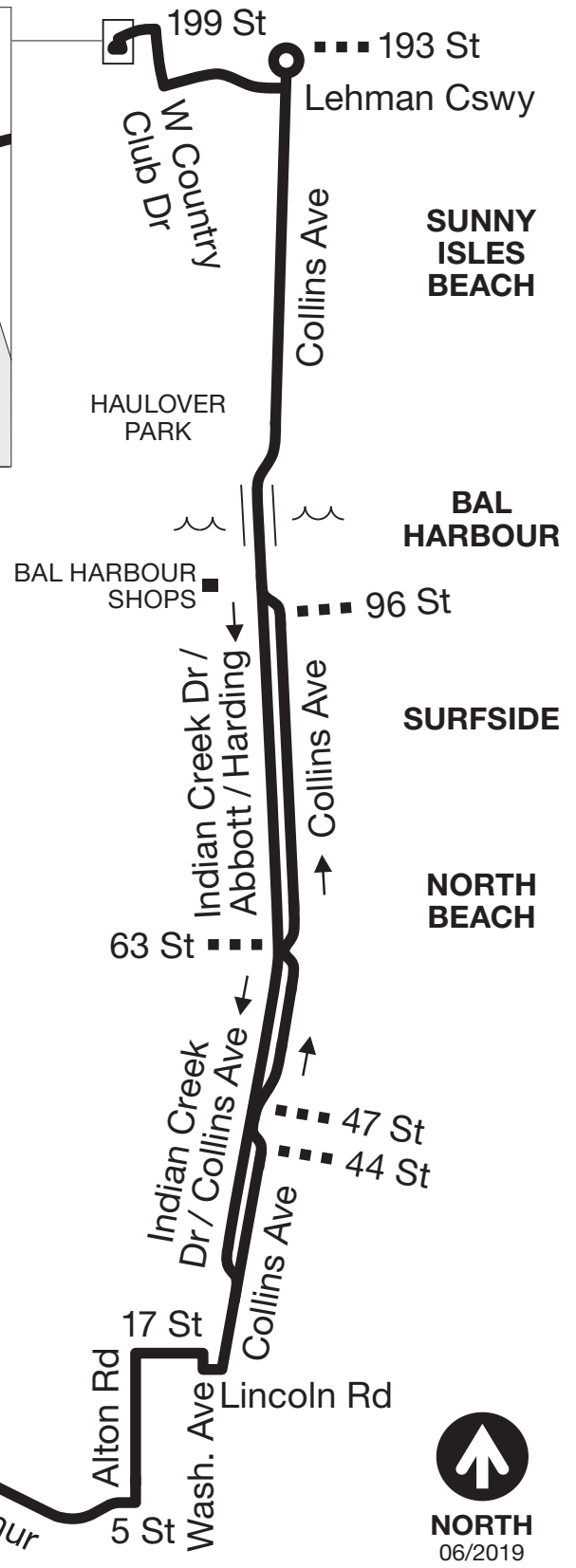
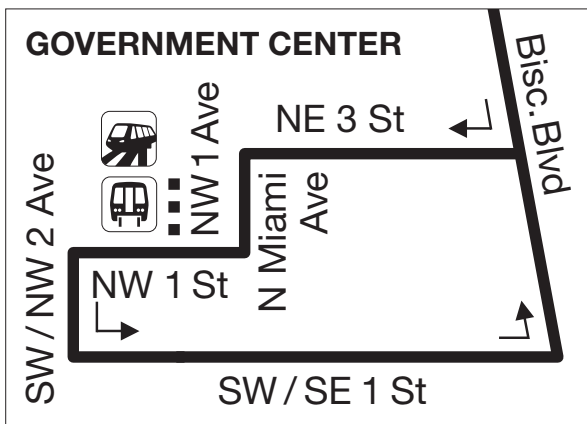
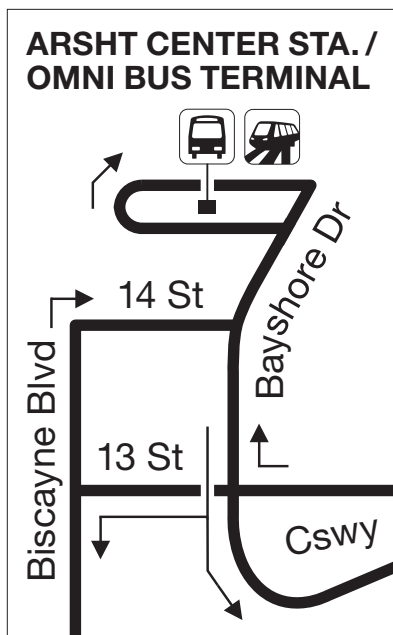
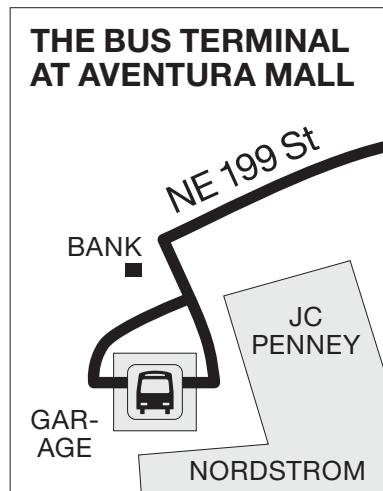
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**NORTH**  
06/2019



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**311** or 305.468.5900 TTY/Fla Relay: 711





Back

Schedule



<b>119 Route S</b>	
- Weekday (Northbound)	
MAC ARTHUR CY TERMINAL ISLE	
<b>5:15 AM</b>	Dest: S - Aventura Mall
<b>5:39 AM</b>	
<b>5:51 AM</b>	Dest: S - Aventura Mall
<b>6:04 AM</b>	Dest: S - Aventura Mall
<b>6:19 AM</b>	Dest: S - Aventura Mall
<b>6:34 AM</b>	Dest: S - Aventura Mall
<b>6:49 AM</b>	Dest: S - Aventura Mall
<b>7:05 AM</b>	Dest: S - Aventura Mall
<b>7:21 AM</b>	Dest: S - Aventura Mall
<b>7:35 AM</b>	Dest: S - Aventura Mall
<b>7:45 AM</b>	Dest: S - Aventura Mall
<b>7:55 AM</b>	Dest: S - Aventura Mall
<b>8:06 AM</b>	Dest: S - Aventura Mall
<b>8:17 AM</b>	Dest: S - Aventura Mall
<b>8:27 AM</b>	Dest: S - Aventura Mall
<b>8:37 AM</b>	Dest: S - Aventura Mall

Schedule	
	
<b>8:57 AM</b> Dest: S - Aventura Mall	
<b>9:08 AM</b> Dest: S - Aventura Mall	
<b>9:20 AM</b> Dest: S - Aventura Mall	
<b>9:30 AM</b> Dest: S - Aventura Mall	
<b>9:40 AM</b> Dest: S - Aventura Mall	
<b>9:50 AM</b> Dest: S - Aventura Mall	
<b>10:00 AM</b> Dest: S - Aventura Mall	
<b>10:10 AM</b> Dest: S - Aventura Mall	
<b>10:20 AM</b> Dest: S - Aventura Mall	
<b>10:25 AM</b> Dest: S - Aventura Mall	
<b>10:30 AM</b> Dest: S - Aventura Mall	
<b>10:35 AM</b> Dest: S - Aventura Mall	
<b>10:40 AM</b> Dest: S - Aventura Mall	
<b>10:50 AM</b> Dest: S - Aventura Mall	
<b>11:00 AM</b> Dest: S - Aventura Mall	
<b>11:10 AM</b> Dest: S - Aventura Mall	
<b>11:20 AM</b> Dest: S - Aventura Mall	
<b>11:30 AM</b> Dest: S - Aventura Mall	



Back

Schedule





<b>11:50 AM</b> Dest: S - Aventura Mall
<b>12:00 PM</b> Dest: S - Aventura Mall
<b>12:10 PM</b> Dest: S - Aventura Mall
<b>12:20 PM</b> Dest: S - Aventura Mall
<b>12:30 PM</b> Dest: S - Aventura Mall
<b>12:40 PM</b> Dest: S - Aventura Mall
<b>12:50 PM</b> Dest: S - Aventura Mall
<b>1:00 PM</b> Dest: S - Aventura Mall
<b>1:05 PM</b> Dest: S - Aventura Mall
<b>1:10 PM</b> Dest: S - Aventura Mall
<b>1:15 PM</b> Dest: S - Aventura Mall
<b>1:20 PM</b> Dest: S - Aventura Mall
<b>1:30 PM</b> Dest: S - Aventura Mall
<b>1:40 PM</b> Dest: S - Aventura Mall
<b>1:50 PM</b> Dest: S - Aventura Mall
<b>2:01 PM</b> Dest: S - Aventura Mall
<b>2:11 PM</b> Dest: S - Aventura Mall
<b>2:21 PM</b> Dest: S - Aventura Mall

Back

Schedule



<b>2:41 PM</b> Dest: S - Aventura Mall
<b>2:46 PM (4 min)</b> Dest: S - Aventura Mall
<b>2:51 PM</b> Dest: S - Aventura Mall
<b>2:56 PM</b> Dest: S - Aventura Mall
<b>3:01 PM</b> Dest: S - Aventura Mall
<b>3:11 PM</b> Dest: S - Aventura Mall
<b>3:21 PM</b> Dest: S - Aventura Mall
<b>3:31 PM</b> Dest: S - Aventura Mall
<b>3:41 PM</b> Dest: S - Aventura Mall
<b>3:51 PM</b> Dest: S - Aventura Mall
<b>4:01 PM</b> Dest: S - Aventura Mall
<b>4:11 PM</b> Dest: S - Aventura Mall
<b>4:21 PM</b> Dest: S - Aventura Mall
<b>4:31 PM</b> Dest: S - Aventura Mall
<b>4:41 PM</b> Dest: S - Aventura Mall
<b>4:51 PM</b> Dest: S - Aventura Mall
<b>5:01 PM</b> Dest: S - Aventura Mall
<b>5:11 PM</b> Dest: S - Aventura Mall

Schedule	
	
<b>5:31 PM</b> Dest: S - Aventura Mall	
<b>5:36 PM</b> Dest: S - Aventura Mall	
<b>5:41 PM</b> Dest: S - Aventura Mall	
<b>5:46 PM</b> Dest: S - Aventura Mall	
<b>5:51 PM</b> Dest: S - Aventura Mall	
<b>6:01 PM</b> Dest: S - Aventura Mall	
<b>6:11 PM</b> Dest: S - Aventura Mall	
<b>6:21 PM</b> Dest: S - Aventura Mall	
<b>6:31 PM</b> Dest: S - Aventura Mall	
<b>6:41 PM</b> Dest: S - Aventura Mall	
<b>6:51 PM</b> Dest: S - Aventura Mall	
<b>7:01 PM</b> Dest: S - Aventura Mall	
<b>7:09 PM</b> Dest: S - Aventura Mall	
<b>7:19 PM</b> Dest: S - Aventura Mall	
<b>7:26 PM</b> Dest: S - Aventura Mall	
<b>7:38 PM</b> Dest: S - Aventura Mall	
<b>7:52 PM</b> Dest: S - Aventura Mall	
<b>8:10 PM</b> Dest: S - Aventura Mall	

Back

Schedule



<b>8:57 PM</b> Dest: S - Aventura Mall
<b>9:22 PM</b> Dest: S - Aventura Mall
<b>9:47 PM</b> Dest: S - Aventura Mall
<b>10:10 PM</b> Dest: S - Aventura Mall
<b>10:34 PM</b> Dest: S - Aventura Mall
<b>10:59 PM</b> Dest: S - Aventura Mall
<b>11:29 PM</b> Dest: S - Aventura Mall
<b>11:59 PM</b> Dest: S - Aventura Mall

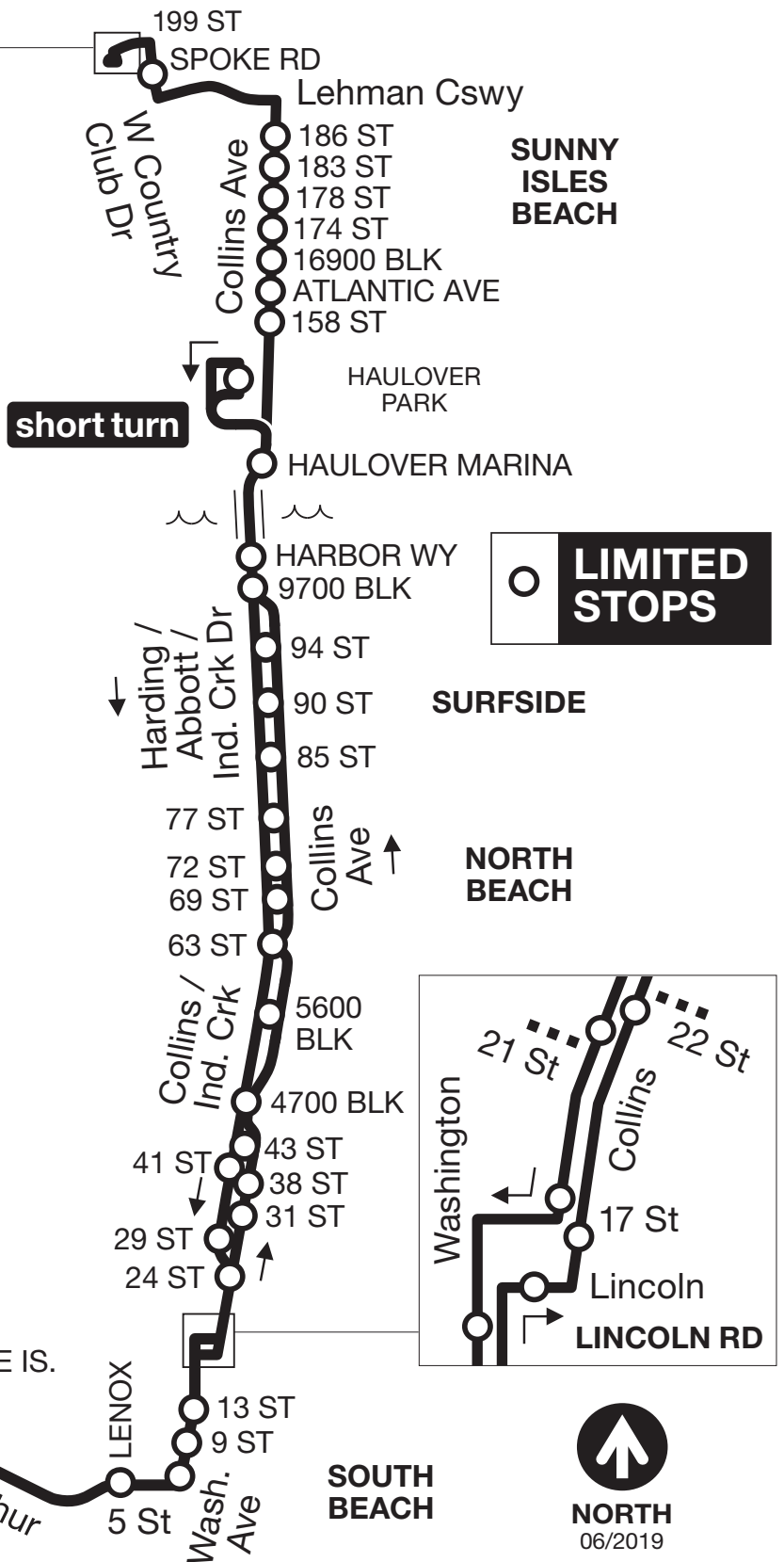
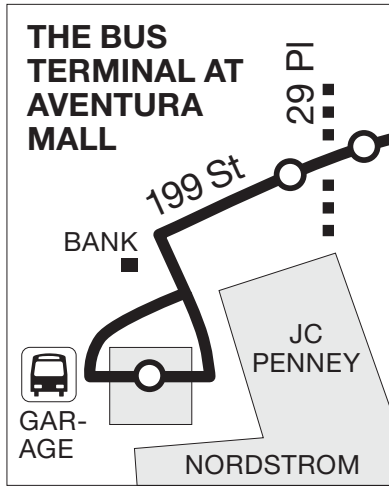
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# 120

## BEACH MAX



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311 or 305.468.5900 TTY/Fla Relay: 711






Back

Schedule

Home

120 Beach MAX	
- Weekday (Northbound)	
5 ST LENOX AV	
5:22 AM	Dest: MAX to Aventura
6:07 AM	Dest: MAX to Aventura
6:38 AM	Dest: MAX to Haulover Park
7:09 AM	Dest: MAX to Aventura
7:33 AM	Dest: MAX to Haulover Park
7:48 AM	Dest: MAX to Aventura
7:59 AM	Dest: MAX to Haulover Park
8:09 AM	Dest: MAX to Aventura
8:22 AM	Dest: MAX to Haulover Park
8:32 AM	Dest: MAX to Aventura
8:42 AM	Dest: MAX to Haulover Park
8:52 AM	Dest: MAX to Aventura
9:04 AM	Dest: MAX to Haulover Park
9:14 AM	Dest: MAX to Aventura
9:24 AM	Dest: MAX to Haulover Park
9:34 AM	Dest: MAX to Aventura

Schedule	
	
<b>9:54 AM</b> Dest: MAX to Aventura	
<b>10:04 AM</b> Dest: MAX to Haulover Park	
<b>10:14 AM</b> Dest: MAX to Aventura	
<b>10:24 AM</b> Dest: MAX to Haulover Park	
<b>10:34 AM</b> Dest: MAX to Aventura	
<b>10:44 AM</b> Dest: MAX to Haulover Park	
<b>10:54 AM</b> Dest: MAX to Aventura	
<b>11:04 AM</b> Dest: MAX to Haulover Park	
<b>11:14 AM</b> Dest: MAX to Aventura	
<b>11:24 AM</b> Dest: MAX to Haulover Park	
<b>11:34 AM</b> Dest: MAX to Aventura	
<b>11:44 AM</b> Dest: MAX to Haulover Park	
<b>11:54 AM</b> Dest: MAX to Aventura	
<b>12:04 PM</b> Dest: MAX to Haulover Park	
<b>12:14 PM</b> Dest: MAX to Aventura	
<b>12:24 PM</b> Dest: MAX to Haulover Park	
<b>12:34 PM</b> Dest: MAX to Aventura	
<b>12:44 PM</b> Dest: MAX to Haulover Park	

Schedule	
	
<b>1:04 PM</b> Dest: MAX to Haulover Park	
<b>1:14 PM</b> Dest: MAX to Aventura	
<b>1:24 PM</b> Dest: MAX to Haulover Park	
<b>1:34 PM</b> Dest: MAX to Aventura	
<b>1:44 PM</b> Dest: MAX to Haulover Park	
<b>1:54 PM</b> Dest: MAX to Aventura	
<b>2:04 PM</b> Dest: MAX to Haulover Park	
<b>2:14 PM</b> Dest: MAX to Aventura	
<b>2:24 PM</b> Dest: MAX to Haulover Park	
<b>2:34 PM</b> Dest: MAX to Aventura	
<b>2:44 PM (Under 1 min)</b> Dest: MAX to Haulover Park	
<b>2:54 PM</b> Dest: MAX to Aventura	
<b>3:04 PM</b> Dest: MAX to Haulover Park	
<b>3:14 PM</b> Dest: MAX to Aventura	
<b>3:25 PM</b> Dest: MAX to Haulover Park	
<b>3:35 PM</b> Dest: MAX to Aventura	
<b>3:45 PM</b> Dest: MAX to Haulover Park	
<b>3:55 PM</b> Dest: MAX to Aventura	



<div><div>Back</div><div>Schedule</div><div></div></div>	
4:15 PM	Dest: MAX to Aventura
4:25 PM	Dest: MAX to Haulover Park
4:35 PM	Dest: MAX to Aventura
4:45 PM	Dest: MAX to Haulover Park
4:55 PM	Dest: MAX to Aventura
5:05 PM	Dest: MAX to Haulover Park
5:15 PM	Dest: MAX to Aventura
5:25 PM	Dest: MAX to Haulover Park
5:35 PM	Dest: MAX to Aventura
5:45 PM	Dest: MAX to Haulover Park
5:55 PM	Dest: MAX to Aventura
6:05 PM	Dest: MAX to Haulover Park
6:15 PM	Dest: MAX to Aventura
6:25 PM	Dest: MAX to Haulover Park
6:35 PM	Dest: MAX to Aventura
6:45 PM	Dest: MAX to Haulover Park
6:55 PM	Dest: MAX to Aventura
7:05 PM	Dest: MAX to Aventura

Back

Schedule



7:23 PM

Dest: MAX to Aventura

7:37 PM

Dest: MAX to Aventura

8:02 PM

Dest: MAX to Aventura

8:42 PM

Dest: MAX to Aventura

9:22 PM

Dest: MAX to Aventura

9:57 PM

Dest: MAX to Aventura



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# METROBUS SYSTEM

MAY 2019

- METROBUS ROUTES**
- Express Service
  - Non-stop Service
  - Local Shuttle or Circulator Service
- METROBUS DESTINATIONS**
- Service Stop/Point - Single Route Type
  - Service Stop/Point - Multiple Route Types
  - Terminal
  - Park and Ride Lot
  - South Dade Transferway Station
  - Metrolink & Station - Routes Serving Station
  - Trillium
  - Brightline

## BROWARD COUNTY



## FLORIDA KEYS



## DOWNTOWN MIAMI



Connects with Metrolink Serves Park & Ride Lot Overnight Service Serves Miami International Airport Connects with Tri-Rail Connects with Brightline

- 1 Perimeter to Oquirrid Blvd/127 Ave
- 2 127 St Mall, 84 St to Downtown Miami
- 3 American Mall to Downtown Miami
- 4 Douglas Mall, Miami Int'l Airport to Downtown Miami
- 5 FID Midway Campus to Brickell Metrolink
- 6 American, 163 St Mall to Downtown Miami
- 7 Skyline Mall to Downtown Metrolink
- 8 FID Midway Campus, Mall of the Americas to Downtown Miami
- 9 Northside Metrolink to Downtown Miami
- 10 163 St Mall to Downtown Metrolink
- 11 Normandy to Wynnton Metrolink
- 12 (WEEKENDS ONLY) MDC North Campus to 163 St Mall
- 13 Northside Metrolink to Downtown Miami
- 14 163 St Mall to Coconut Grove Metrolink
- 15 CANAL WAY LIMITED - West Side to 163 St Mall Metrolink
- 16 Miami Gardens to Coconut Grove Metrolink
- 17 (WEEKENDS ONLY) Miami Lakes Education Center to Hialeah
- 18 BURNING LOCAL - South Dade Government Center to Dadeland South Metrolink
- 19 Coral City to Dadeland Metrolink
- 20 Hialeah to NE 79 St/Busway Blvd
- 21 34 EXPRESS (WEEKENDS ONLY) Florida City to Dadeland South Metrolink
- 22 34 EXPRESS (WEEKENDS ONLY) Florida City to Dadeland South Metrolink
- 23 Douglas Mall, Dadeland, Miami Springs to Dadeland Metrolink
- 24 Hialeah to South Miami Metrolink
- 25 BURNING MAX - Dadeland South Metrolink to Florida City
- 26 34 EXPRESS (WEEKENDS ONLY) South Dade Govt Ctr to Dadeland South Metrolink
- 27 Lakes of the Meadows, Turnpike Trail/122 Ave to Douglas Road Metrolink
- 28 Douglas to Douglas Metrolink
- 29 LIBERTY CITY CONNECTION (WEEKENDS ONLY) Broward Metrolink to Southwest Avenue Transit Village
- 30 FLORIAN MAX (WEEKENDS ONLY) West Side to Downtown Miami
- 31 Dadeland South Metrolink to South Dade Metrolink
- 32 Miami Gardens/127 Ave, Hialeah Gardens to Busway Blvd/NE 54 St
- 33 (WEEKENDS ONLY) West Side to Miami Children's Hospital
- 34 (WEEKENDS ONLY) Miami Int'l Airport to Jackson South Metrolink
- 35 Hialeah to Busway Blvd/162 St
- 36 Douglas Mall to MDC North Campus
- 37 West Kendall Metrolink, Miramar Square to South Miami Metrolink
- 38 Miami Gardens to 127 Ave to Park & Ride to Dadeland South Metrolink
- 39 Miami Lakes Education Center to FID Busway Campus
- 40 Normandy to Downtown Miami
- 41 79 STREET MAX (WEEKENDS ONLY) Northside Metrolink to 72 St / Miami Beach
- 42 WESTCHESTER CIRCULATOR (WEEKENDS ONLY) FID Midway Campus to Flagler
- 43 Palmetto Metrolink, Coral to Dadeland North Metrolink
- 44 Dadeland North Metrolink to West Kendall Metrolink
- 45 BISCAYNE MAX (WEEKENDS ONLY) Downtown Miami to Aventura Mall
- 46 95 EXPRESS GOLDEN GLADES (WEEKENDS ONLY) Coral City, Aventura Mall, Golden Glades to Downtown Miami, Civic Center
- 47 95 EXPRESS DASH BROWARD (WEEKENDS ONLY) ROUTE 195: Broward Blvd to Downtown Miami ROUTE 296: Standards St to Downtown Miami ROUTE 295: Broward Blvd to Civic Center ROUTE 294: Standards St to Civic Center
- 48 Miami Gardens to 127 Ave to Park & Ride to Aventura Mall
- 49 ROUTE 192: Brickell Metrolink to Downtown Miami
- 50 ROUTE 192: South Beach to NE 55th Medical Center
- 51 West Kendall Metrolink to Dadeland North Metrolink
- 52 ROUTE 192: Golden Glades to Hialeah Metrolink
- 53 ROUTE 192: 163 St / Miami Beach to MDC North Campus
- 54 ROUTE 192: 163 St Mall to Hialeah Metrolink
- 55 ROUTE 192: Miami Int'l Airport to 163 St Mall
- 56 ROUTE 192: Lincoln Rd to Hialeah Metrolink
- 57 ROUTE 192: Civic Center to NE 55th Medical Center
- 58 MID-NORTH BEACH CONNECTION - Collins Ave / 163 St to Lincoln Rd
- 59 ROUTE 192: Downtown Miami to Aventura Mall
- 60 BEACHWAY Downtown Miami to Hialeah Metrolink, Aventura Mall
- 61 TRAILWAY SHUTTLE (WEEKENDS ONLY) Hialeah Metrolink to Hialeah Metrolink
- 62 Hialeah Metrolink, Miami Lakes to 190 Busway Campus
- 63 (WEEKENDS ONLY) 190 St to Douglas Road Metrolink
- 64 WEST DASH CONNECTION Douglas Road to South Dade Govt Center
- 65 MIAMI BEACH AIRPORT EXPRESS Miami Int'l Airport to South Beach
- 66 BISCAYNE GARDENS CIRCULATOR (WEEKENDS ONLY)
- 67 Miami Gardens to 127 Ave to Park & Ride to Aventura Mall
- 68 CYPRESS WAY CIRCULATOR
- 69 LITTLE HAVEN CONNECTION (WEEKENDS ONLY) NW 5 Ave / 83 St to Miami Design District
- 70 WILLIAM WAY (WEEKENDS ONLY) West Kendall Metrolink to Dadeland North Metrolink
- 71 LITTLE HAVEN CONNECTION (WEEKENDS ONLY) Downtown Miami, Brickell to SW 25 Ave via SW 15 & SW 10
- 72 LITTLE HAVEN CIRCULATOR Douglas Mall to 163 St Mall
- 73 DOWNTOWN CIRCULATOR (WEEKENDS ONLY)
- 74 SWATCHER CIRCULATOR (WEEKENDS ONLY)
- 75 BANCHE PARK CIRCULATOR (WEEKENDS ONLY) NW 127 St / 22 Ave to Dadeland Metrolink
- 76 EAST WEST CONNECTION (WEEKENDS ONLY) Douglas Mall to Miami Int'l Airport
- 77 NIGHT ONE Downtown Miami to 163 St Mall
- 78 CORAL WAY AND COUNTRY ROAD to Dadeland South Metrolink, 34 Miami Metrolink
- 79 BROWARD CIRCULATOR (WEEKENDS ONLY) Jefferson Avenue Park, Hialeah (Thursday only)
- 80 LAKELAND LIMITED (WEEKENDS ONLY) NW 163 St to Dadeland Metrolink
- 81 SUNSET WAY (WEEKENDS ONLY) West Kendall Metrolink to Dadeland North Metrolink
- 82 NW 17 AVENUE MAX (WEEKENDS ONLY) Downtown Miami to Golden Glades Park & Ride
- 83 NORTH POINT CIRCULATOR (WEEKENDS ONLY) Miami Gardens to NW 73 Ave Park & Ride to NW 57 Ave/NW 75 St
- 84 LAKELAND MAX (WEEKENDS ONLY) Hialeah Metrolink to Dadeland South Metrolink
- 85 METROLINK CIRCULATOR (WEEKENDS ONLY) West Kendall Metrolink to Dadeland North Metrolink
- 86 275th Ave/SHAWWAY (WEEKENDS ONLY) Miami Int'l Airport to Miami Gardens
- 87 DASH HAWAII EXPRESS Florida City to Hialeah Metrolink
- 88 CASH DASH EXPRESS Florida City to Dadeland Metrolink
- 89 WEDDING EXPRESS (WEEKENDS ONLY) Miami Int'l Airport to Douglas Mall
- 90 (WEEKENDS ONLY) Florida City to MDC North Campus
- 91 WINDWARD ONE Dadeland South Metrolink to Downtown Miami

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# MIAMI BEACH TROLLEY

## LEGEND

- NORTH BEACH LOOP
- COLLINS EXPRESS
- MIDDLE BEACH LOOP
- SOUTH BEACH LOOPS

## TRANSFER POINTS

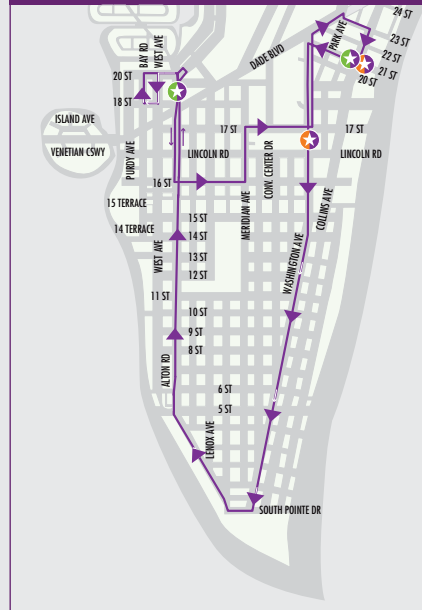
- NORTH BEACH LOOP
- COLLINS EXPRESS
- MIDDLE BEACH LOOP
- SOUTH BEACH LOOPS



See detailed route maps for South Beach Loops ▶

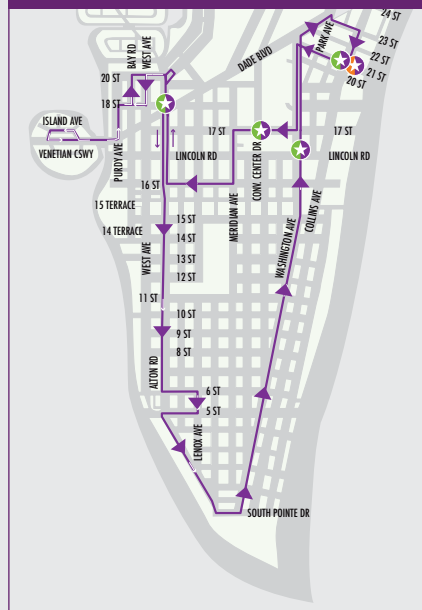
### SOUTH BEACH LOOP - A

Clockwise



### SOUTH BEACH LOOP - B

Counter Clockwise



# **Appendix K**

## **Ferry Terminal and MacArthur Causeway / Terminal Isle Intersection Queuing Observations**

## MacArthur Cswy / Terminal Island Intersection

### MacArthur Cswy / Terminal Island Field Observations - Queue

Location: MacArthur Cswy / Terminal Island

Peak hour: 8:00 - 9:00 AM

Observer:

Peak 15 min: 8:15 - 8:30 AM

Date: 10/7/2021

Observed:

MacArthur Causeway / Terminal Island Road				
Time	MacArthur Causeway			Terminal Island
	Inbound Left	Inbound Right	Outbound LT Merge Lane	OutBound
7:55	3	0	0	0
7:56	5	2	0	2
7:57	0	0	0	0
7:58	1	0	0	1
7:59	5	5	0	0
8:00	0	0	0	1
8:01	1	0	0	0
8:02	1	0	0	0
8:03	7	0	0	2
8:04	7	0	0	0
8:05	5	0	0	0
8:06	9	1	0	0
8:07	3	0	0	0
8:08	5	0	0	0
8:09	5	4	0	0
8:10	0	0	0	3
8:11	1	0	0	0
8:12	3	0	0	0
8:13	3	0	0	1
8:14	3	0	0	3
8:15	3	0	0	0
8:16	0	3	0	6
8:17	1	0	0	7
8:18	2	0	0	0
8:19	3	0	0	4
8:20	2	0	0	5
8:21	2	2	0	0
8:22	4	4	0	0
8:23	3	0	0	0
8:24	5	4	0	0

# MacArthur Cswy / Terminal Island Field Observations - Queue

Location: MacArthur Cswy / Terminal Island

Peak hour: 8:00 - 9:00 AM

Observer:

Peak 15 min: 8:15 - 8:30 AM

Date: 10/7/2021

Observed:

MacArthur Causeway / Terminal Island Road				
Time	MacArthur Causeway			Terminal Island
	Inbound Left	Inbound Right	Outbound LT Merge Lane	OutBound
8:25	1	4	0	1
8:26	3	0	0	0
8:27	4	0	0	0
8:28	4	6	0	3
8:29	2	0	0	0
8:30	2	0	0	4
8:31	0	0	0	0
8:32	1	0	0	2
8:33	1	1	0	0
8:34	3	1	0	1
8:35	3	0	0	2
8:36	7	1	0	3
8:37	8	1	0	1
8:38	1	0	0	3
8:39	3	1	0	0
8:40	2	4	0	1
8:41	7	0	0	3
8:42	8	0	0	0
8:43	8	0	0	0
8:44	5	0	0	0
8:45	7	0	0	1
8:46	3	0	0	1
8:47	4	0	0	2
8:48	4	0	0	3
8:49	4	0	0	2
8:50	0	0	0	4
8:51	0	0	0	0
8:52	1	4	0	0
8:53	2	0	0	2
8:54	4	3	0	0

### MacArthur Cswy / Terminal Island Field Observations - Queue

Location: MacArthur Cswy / Terminal Island

Peak hour: 8:00 - 9:00 AM

Observer:

Peak 15 min: 8:15 - 8:30 AM

Date: 10/7/2021

Observed:

MacArthur Causeway / Terminal Island Road				
Time	MacArthur Causeway			Terminal Island
	Inbound Left	Inbound Right	Outbound LT Merge Lane	OutBound
8:55	0	3	0	0
8:56	0	0	0	0
8:57	0	0	0	3
8:58	0	0	0	1
8:59	1	0	0	0
9:00	1	2	0	0
9:01	0	3	0	1
9:02	2	0	0	0
9:03	2	1	0	3
9:04	3	1	0	0
9:05	0	0	0	1
9:06	1	0	0	3
9:07	2	2	0	0
9:08	2	0	0	1
9:09	3	0	0	0
9:10	1	0	0	0
9:11	3	0	0	2
9:12	4	0	0	3
9:13	0	3	0	1
9:14	1	0	0	5
Total	220	66	0	98
Highest Queue:	9	6	0	7
Average Queue:	3	1	-	1



## MacArthur Cswy / Terminal Island Intersection

### MacArthur Cswy / Terminal Island Field Observations - Queue

Location: MacArthur Cswy / Terminal Island

Peak hour: 5:00 - 6:00 PM

Observer: Nicole

Peak 15 min: 5:15 - 5:30 PM

Date: 10/7/2021

Observed:

MacArthur Causeway / Terminal Island Road Intersection				
Time	MacArthur Causeway			Terminal Island Road
	Inbound Left	Inbound Right	WB LT Merge Lane	
4:45	2	0	0	0
4:46	1	0	0	0
4:47	0	1	0	0
4:48	0	2	0	0
4:49	0	0	0	0
4:50	1	1	0	18
4:51	0	0	0	19
4:52	0	1	0	16
4:53	0	0	0	9
4:54	0	0	0	0
4:55	1	0	0	0
4:56	0	0	0	10
4:57	0	0	0	13
4:58	0	0	0	0
4:59	0	0	0	15
5:00	0	0	0	0
5:01	1	1	0	0
5:02	0	0	0	2
5:03	1	0	0	0
5:04	2	0	0	1
5:05	0	0	0	0
5:06	0	0	0	0
5:07	1	0	0	0
5:08	2	0	0	1
5:09	0		0	17
5:10	0	0	0	20
5:11	0	1	0	21
5:12	1	0	0	19
5:13	0	0	0	5
5:14	1	0	0	10

### MacArthur Cswy / Terminal Island Field Observations - Queue

Location: MacArthur Cswy / Terminal Island

Peak hour: 5:00 - 6:00 PM

Observer: Nicole

Peak 15 min: 5:15 - 5:30 PM

Date: 10/7/2021

Observed:

MacArthur Causeway / Terminal Island Road Intersection				
Time	MacArthur Causeway			Terminal Island Road
	Inbound Left	Inbound Right	WB LT Merge Lane	
5:15	0	0	0	7
5:16	1	0	0	0
5:17	2	0	0	0
5:18	0	0	0	0
5:19	1	0	0	2
5:20	0	2	0	0
5:21	0	0	0	0
5:22	1	0	0	1
5:23	2	0	0	15
5:24		0	0	0
5:25	0	0	0	7
5:26		0	0	11
5:27	0	0	0	9
5:28	0	0	0	0
5:29	0	0	0	13
5:30	0	0	0	7
5:31	1	0	0	0
5:32	0	0	0	2
5:33	1	0	0	0
5:34	1	0	0	0
5:35	0	0	0	1
5:36	1	0	0	1
5:37	1	0	0	3
5:38	0	0	0	0
5:39	0	0	0	0
5:40	0	0	0	0
5:41	1	0	0	17
5:42	0	0	0	14
5:43	1	0	0	17
5:44	0	0	0	12

### MacArthur Cswy / Terminal Island Field Observations - Queue

Location: MacArthur Cswy / Terminal Island

Peak hour: 5:00 - 6:00 PM

Observer: Nicole

Peak 15 min: 5:15 - 5:30 PM

Date: 10/7/2021

Observed:

MacArthur Causeway / Terminal Island Road Intersection				
Time	MacArthur Causeway			Terminal Island Road
	Inbound Left	Inbound Right	WB LT Merge Lane	
5:45	0	0	0	17
5:46	2	0	0	9
5:47	3	0	0	10
5:48	0	0	0	1
5:49	1	0	0	0
5:50	0	0	0	0
5:51	0	0	0	0
5:52	0	0	0	0
5:53	0	0	0	0
5:54	0	0	0	5
5:55	0	0	0	7
5:56	0	0	0	0
5:57	0	0	0	3
5:58	0	0	0	0
5:59	0	0	0	4
6:00	0	1	0	0
6:01	0	0	0	1
6:02	1	0	0	0
6:03	2	0	0	1
6:04	0	0	0	0
6:05	0	0	0	0
6:06	0	0	0	0
6:07	0	0	0	1
6:08	0	1	0	0
6:09	0	0	0	1
6:10	0	0	0	1
6:11	1	0	0	6
6:12	0	0	0	10
6:13	0	0	0	12
6:14	1	0	0	5
Total	45	11	0	429

**MacArthur Cswy / Terminal Island Field Observations - Queue**

Location: MacArthur Cswy / Terminal Island

Peak hour: 5:00 - 6:00 PM

Observer: Nicole

Peak 15 min: 5:15 - 5:30 PM

Date: 10/7/2021

Observed:

MacArthur Causeway / Terminal Island Road Intersection				
Time	MacArthur Causeway			Terminal Island Road
	Inbound Left	Inbound Right	WB LT Merge Lane	
Highest Queue:	3	2	0	21
Average Queue:	1	0	-	5

## Terminal Island West Ferry

### Ferry Terminal West Field Observations - Queue

Location: West Ferry Terminal / Terminal Island Road

Peak hour: 8:00 - 9:00 AM

Observer: Fernando

Peak 15 min: 8:15 - 8:30 AM

Date: 10/6/21

Observed:

Ferry Terminal West								
Time	Ferry Inbound				Terminal Road		Ferry Outbound	
	resident lane	guest lane	employee lane	Total	left lane	right lane	right turn to Cswy	Left turn to light
7:45	2	2	3	7	0	0	0	0
7:46	2	3	3	8	0	0	0	0
7:47	2	4	3	9	0	0	0	0
7:48	0	3	3	6	0	0	0	0
7:49	0	1	1	2	0	0	0	0
7:50	0	0	0	0	0	0	0	0
7:51	0	0	3	3	0	0	0	0
7:52	0	0	4	4	0	0	0	0
7:53	0	2	5	7	0	0	0	0
7:54	0	3	6	9	0	1	0	0
7:55	0	3	6	9	0	1	0	0
7:56	0	3	6	9	0	1	0	0
7:57	0	3	6	9	0	1	0	0
7:58	0		6	6	0	4	0	0
7:59	0	1	5	6	0	0	0	0
8:00	0	2	4	6	0	0	0	0
8:01	0	0	0	0	0	0	0	0
8:02	0	0	0	0	0	0	0	0
8:03	1	1	2	4	0	0	0	0
8:04	1	1	3	5	0	0	0	0
8:05	1	1	4	6	0	0	0	0
8:06	1	1	5	7	0	0	0	0
8:07	1	1	5	7	0	0	0	0
8:08	0	0	0	0	0	0	0	0
8:09	0	1	1	2	0	0	0	0
8:10	0	0	2	2	0	0	0	0
8:11	1	4	4	9	0	0	0	0
8:12	1	4	4	9	0	0	0	0
8:13	1	4	5	10	0	0	0	0
8:14	1	4	5	10	0	0	0	0

### Ferry Terminal West Field Observations - Queue

Location: West Ferry Terminal / Terminal Island Road

Peak hour: 8:00 - 9:00 AM

Observer: Fernando

Peak 15 min: 8:15 - 8:30 AM

Date: 10/6/21

Observed:

Ferry Terminal West								
Time	Ferry Inbound				Terminal Road		Ferry Outbound	
	resident lane	guest lane	employee lane	Total	left lane	right lane	right turn to Cswy	Left turn to light
8:15	1	4	5	10	0	0	0	0
8:16	2	4	6	12	0	0	0	0
8:17	0	5	6	11	0	0	0	0
8:18	1	0	6	7	0	0	0	0
8:19	0	1	2	3	0	0	0	0
8:20	0	0	0	0	0	0	0	0
8:21	0	0	1	1	0	0	0	0
8:22	0	1	1	2	0	0	0	0
8:23	1	4	1	6	0	0	0	0
8:24	1	5	0	6	0	0	0	0
8:25	1	5	0	6	0	0	0	0
8:26	2	6	2	10	0	0	0	0
8:27	3	6	2	11	0	0	0	0
8:28	0	1	4	5	0	0	0	0
8:29	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0
8:31	0	0	0	0	0	0	0	0
8:32	0	1	0	1	0	0	0	0
8:33	0	1	2	3	0	0	0	0
8:34	0	1	2	3	0	0	0	0
8:35	0	1	3	4	0	0	0	0
8:36	0	2	4	6	0	0	0	0
8:37	2	4	6	12	0	3	0	0
8:38	1	2	6	9	0	2	0	0
8:39	0	0	6	6	0	3	0	0
8:40	0	0	5	5	0	0	0	0
8:41	0	1	5	6	0	0	0	0
8:42	0	1	5	6	0	0	0	0
8:43	0	2	5	7	0	0	0	0
8:44	0	5	5	10	0	0	0	0
8:45		5	6	11	0	0	0	0
8:46	0	4	6	10	0	3	0	0
8:47	0	4	6	10	0	0	0	0
8:48	0	2	5	7	0	0	0	0
8:49	0	3	6	9	0	0	0	0

### Ferry Terminal West Field Observations - Queue

Location: West Ferry Terminal / Terminal Island Road

Peak hour: 8:00 - 9:00 AM

Observer: Fernando

Peak 15 min: 8:15 - 8:30 AM

Date: 10/6/21

Observed:

Ferry Terminal West								
Time	Ferry Inbound				Terminal Road		Ferry Outbound	
	resident lane	guest lane	employee lane	Total	left lane	right lane	right turn to Cswy	Left turn to light
8:50	0	5	2	7	0	0	0	0
8:51	1	0	2	3	0	0	0	0
8:52	0	2	2	4	0	0	0	0
8:53	0	2	3	5	0	0	0	0
8:54	0	2	3	5	0	0	0	0
8:55	0	2	4	6	0	0	0	0
8:56	0	2	4	6	0	0	0	0
8:57	0	2	4	6	0	0	0	0
8:58	0	4	6	10	0	0	0	0
8:59	0	0	6	6	0	0	0	0
9:00	0	0	0	0	0	0	0	0
9:01	0	0	0	0	0	0	0	0
9:02	2	3	0	5	0	0	0	0
9:03	2	4	1	7	0	0	0	0
9:04	2	4	3	9	0	0	0	0
9:05	3	5	3	11	0	0	0	0
9:06	3	5	3	11	0	0	0	0
9:07	3	5	4	12	0	0	0	0
9:08	0	0	6	6	0	0	0	0
9:09	0	0	1	1	0	0	0	0
9:10	0	1	0	1	0	0	0	0
9:11	0	2	1	3	0	0	0	0
9:12	0	2	1	3	0	0	0	0
9:13	0	3	3	6	0	0	0	0
9:14	0	4	4	8	0	0	0	0
Total	46	192	289	527	0	19	0	0
Highest Queue:	3	6	6	12	0	4	0	0
Average Queue:	1	2	3	6	0	0	0	0

## Terminal West Island Ferry

### Ferry Terminal West Field Observations - Queue

Location: West Ferry Terminal / Terminal Island Road

Peak hour: 5:00 - 6:00 PM

Observer:

Peak 15 min: 5:15 - 5:30 PM

Date:

Observed:

Ferry Terminal West								
Time	Ferry Inbound				Terminal Road		Ferry Outbound	
	resident lane	guest lane	employee lane	Total	left lane	right lane	right turn to Cswy	Left turn to light
4:45	6	4	0	10	0	0	0	0
4:46	0	4	0	4	0	0	0	0
4:47	0	0	0	0	0	0	0	0
4:48	0	0	0	0	0	0	0	0
4:49	0	0	0	0	0	0	0	0
4:50	0	0	0	0	0	0	0	0
4:51	0	0	0	0	0	0	0	0
4:52	0	0	0	0	0	0	0	0
4:53	0	0	0	0	0	0	0	0
4:54	1	0	0	1	0	0	0	0
4:55	2	0	0	2	0	0	0	0
4:56	3	0	0	3	0	0	0	0
4:57	3	0	0	3	0	0	0	1
4:58	3	0	0	3	0	0	2	3
4:59	4	0	0	4	0	0	2	1
5:00	1	0	0	1	0	0	0	0
5:01	0	0	1	1	0	0	0	0
5:02	0	0	0	0	0	0	0	0
5:03	2	0	0	2	0	0	0	0
5:04	2	0	0	2	0	0	0	0
5:05	2	0	0	2	0	0	0	0
5:06	2	1	0	3	0	0	0	0
5:07	2	1	0	3	0	0	0	0
5:08	2	1	0	3	0	0	0	0
5:09	2	1	0	3	0	0	0	0
5:10	2	1	0	3	0	0	0	0
5:11	2	1	0	3	0	0	0	0
5:12	2	1	0	3	0	0	0	0
5:13	2	1	0	3	0	0	0	0
5:14	4	1	0	5	0	0	1	0



### Ferry Terminal West Field Observations - Queue

Location: West Ferry Terminal / Terminal Island Road

Peak hour: 5:00 - 6:00 PM

Observer:

Peak 15 min: 5:15 - 5:30 PM

Date:

Observed:

Ferry Terminal West								
Time	Ferry Inbound				Terminal Road		Ferry Outbound	
	resident lane	guest lane	employee lane	Total	left lane	right lane	right turn to Cswy	Left turn to light
5:15	4	1	0	5	0	0	0	7
5:16	0	0	0	0	0	0	0	8
5:17	0	0	0	0	0	0	0	0
5:18	0	0	0	0	0	0	0	0
5:19	0	0	0	0	0	0	0	0
5:20	0	0	0	0	0	0	0	0
5:21	1	0	0	1	0	0	0	0
5:22	2	0	0	2	0	0	0	0
5:23	2	0	0	2	0	0	0	0
5:24	4	0	0	4	0	0	0	0
5:25	5	0	0	5	0	0	0	0
5:26	6	0	0	6	0	0	0	0
5:27	7	0	0	7	1	0	0	0
5:28	7	0	0	7	1	0	0	0
5:29	0	0	0	0	0	0	0	0
5:30	0	1	0	1	0	0	0	0
5:31	0	1	0	1	0	0	0	0
5:32	0	0	0	0	0	0	0	0
5:33	0	1	0	1	0	0	0	0
5:34	0	1	0	1	0	0	0	0
5:35	0	1	0	1	0	0	0	0
5:36	0	1	0	1	0	0	0	0
5:37	0	1	0	1	0	0	0	0
5:38	0	1	0	1	0	0	0	0
5:39	0	1	0	1	0	0	0	0
5:40	0	1	0	1	0	0	0	0
5:41	1	1	0	2	0	0	0	0
5:42	1	1	0	2	0	0	0	0
5:43	2	1	0	3	0	0	0	0
5:44	2	2	0	4	0	0	0	0

# Ferry Terminal West Field Observations - Queue

Location: West Ferry Terminal / Terminal Island Road

Peak hour: 5:00 - 6:00 PM

Observer:

Peak 15 min: 5:15 - 5:30 PM

Date:

Observed:

Ferry Terminal West								
Time	Ferry Inbound				Terminal Road		Ferry Outbound	
	resident lane	guest lane	employee lane	Total	left lane	right lane	right turn to Cswy	Left turn to light
5:45	3	2	0	5	0	0	0	0
5:46	4	2	1	7	0	0	0	6
5:47	0	2	1	3	0	0	0	2
5:48	0	0	0	0	0	0	0	2
5:49	0	0	0	0	0	0	0	0
5:50	0	0	0	0	0	0	0	0
5:51	0	1	0	1	0	0	0	0
5:52	0	1	0	1	0	0	0	0
5:53	0	1	1	2	0	0	0	0
5:54	1	1	1	3	0	0	0	0
5:55	1	1	1	3	0	0	0	0
5:56	1	1	1	3	0	0	0	0
5:57	3	2	1	6	0	0	0	0
5:58	3	3	1	7	0	0	1	0
5:59	4	3	1	8	0	0	0	0
6:00	0	3	2	5	0	0	0	0
6:01	0	0	1	1	0	0	0	0
6:02	0	0	1	1	0	0	0	0
6:03	0	1	1	2	0	0	0	0
6:04	0	1	1	2	0	0	0	0
6:05	1	1	1	3	0	0	0	0
6:06	1	1	1	3	0	0	0	0
6:07	3	2	1	6	0	0	0	0
6:08	3	2	1	6	0	0	0	0
6:09	4	2	1	7	0	0	0	0
6:10	5	2	1	8	0	0	0	0
6:11	7	2	1	10	0	0	0	0
6:12	7	2	1	10	0	0	0	0
6:13	7	2	1	10	0	0	0	0
6:14	7	2	1	10	0	0	0	0
Total	158	76	26	260	2	0	6	30
Highest Queue:	7	4	2	10	1	0	2	8
Average Queue:	2	1	0	3	0	-	0	0

# Terminal East Island Ferry

20129

## Ferry Terminal East Field Observations - Queue

Location: East Ferry Terminal / Terminal Island Road

Peak hour: 8:00 - 9:00 AM

Observer: Kansas

Peak 15 min: 8:15 - 8:30 AM

Date: October 6, 2021

Observed Peak:

**Observations of Operations:** the ground floor of the garage has 6 Queuing lanes in the NW corner (front) of the garage for vehicle to queue within while waiting for the Ferry. Garage employees control the queue & verify the ID & permission for the vehicles / companies waiting in the queue so they can controll access to the ferry. Vehicles are also queued ion hashing in front of the garage. Veh that don't fit in 6 lanes get circulated into the one-way roadway that wraps around the end of the garage. Drop-off lane considered started at ped crosswalk to/from garage to Ferry .

Ferry Terminal East						
Time	Ferry Inbound			OutBound	Drop-off (after ped crosswalk)	Terminal Island Road
	Left Storage	Inbound Lane	Right Storage	Lane 1		
7:55	0	0	0	0	0	0
7:56	0	0	0	0	0	0
7:57	0	0	0	0	0	0
7:58	0	0	0	0	0	0
7:59	0	0	0	0	2	2
8:00	0	0	0	0	0	0
8:01	5	0	0	0	3	0
8:02	0	0	0	0	3	0
8:03	0	0	0	0	0	0
8:04	1	0	0	0	0	0
8:05	2	0	0	0	0	0
8:06	2	0	0	0	0	0
8:07	3	0	0	0	0	0
8:08	4	0	0	0	0	0
8:09	4	0	0	0	0	0
8:10	4	0	0	0	3	0
8:11	1	0	0	0	3	0
8:12	0	0	0	0		0
8:13	0	0	0	0	1	0
8:14	0	0	0	0	2	0
8:15	0	0	0	0	3	0
8:16	0	0	0	0	1	0
8:17	0	0	0	0	0	0
8:18	0	0	0	0	3	0
8:19	1	0	0	0	0	0

### Ferry Terminal East Field Observations - Queue

Location: East Ferry Terminal / Terminal Island Road

Peak hour: 8:00 - 9:00 AM

Observer: Kansas

Peak 15 min: 8:15 - 8:30 AM

Date: October 6, 2021

Observed Peak:

**Observations of Operations:** the ground floor of the garage has 6 Queuing lanes in the NW corner (front) of the garage for vehicle to queue within while waiting for the Ferry. Garage employees control the queue & verify the ID & permission for the vehicles / companies waiting in the queue so they can controll access to the ferry. Vehicles are also queued ion hashing in front of the garage. Veh that don't fit in 6 lanes get circulated into the one-way roadway that wraps around the end of the garage. Drop-off lane considered started at ped crosswalk to/from garage to Ferry .

Ferry Terminal East						
Time	Ferry Inbound			OutBound	Drop-off (after ped crosswalk)	Terminal Island Road
	Left Storage	Inbound Lane	Right Storage	Lane 1		
8:20	1	0	0	0	0	0
8:21	2	0	0	0	0	0
8:22	2	0	0	0	0	0
8:23	4	0	0	0	0	0
8:24	4	0	0	0	0	0
8:25	4	0	0	0	0	0
8:26	5	0	0	0	1	0
8:27	2	0	0	0	0	0
8:28	0	2	0	0	0	0
8:29	0	0	0	0	0	0
8:30	0	0	2	0	0	0
8:31	0	0	0	0	0	0
8:32	0	0	0	0	0	2
8:33	0	0	0	0	3	0
8:34	0	0	0	0	2	0
8:35	0	0	0	0	5	0
8:36	0	0	0	0	3	0
8:37	0	0	0	0	0	0
8:38	0	0	0	0	0	0
8:39	0	0	0	0	0	0
8:40	0	0	0	0	0	0
8:41	0	0	0	0	0	0
8:42	0	0	0	0	0	0
8:43	0	0	0	0	0	0
8:44	1	0	0	0	0	1
8:45	2	0	0	0	0	0
8:46	2	0	0	0	0	0
8:47	3	0	0	0	0	0
8:48	3	0	0	0	0	0
8:49	4	0	0	0	0	1

### Ferry Terminal East Field Observations - Queue

Location: East Ferry Terminal / Terminal Island Road

Peak hour: 8:00 - 9:00 AM

Observer: Kansas

Peak 15 min: 8:15 - 8:30 AM

Date: October 6, 2021

Observed Peak:

**Observations of Operations:** the ground floor of the garage has 6 Queuing lanes in the NW corner (front) of the garage for vehicle to queue within while waiting for the Ferry. Garage employees control the queue & verify the ID & permission for the vehicles / companies waiting in the queue so they can controll access to the ferry. Vehicles are also queued ion hashing in front of the garage. Veh that don't fit in 6 lanes get circulated into the one-way roadway that wraps around the end of the garage. Drop-off lane considered started at ped crosswalk to/from garage to Ferry .

Ferry Terminal East						
Time	Ferry Inbound			OutBound	Drop-off (after ped crosswalk)	Terminal Island Road
	Left Storage	Inbound Lane	Right Storage	Lane 1		
8:50	4	0	0	0	1	0
8:51	4	0	1	0	0	4
8:52	4	0	1	0	0	4
8:53	5	0	1	0	2	0
8:54	5	0	1	0	0	0
8:55	5	0	1	0	0	0
8:56	5	0	2	0	0	0
8:57	5	0	2	0	0	0
8:58	5	0	0	0	0	2
8:59	2	0	0	0	2	0
9:00	2	0	0	0	0	0
9:01	2	0	0	0	0	0
9:02	2	0	0	0	0	0
9:03	2	0	0	0	0	0
9:04	2	0	0	0	0	0
9:05	3	0	0	0	0	2
9:06	3	0	0	0	0	0
9:07	3	0	0	0	1	0
9:08	3	0	0	0	0	0
9:09	4	0	1	0	0	0
9:10	4	0	1	0	0	0
9:11	4	0	2	0	0	0
9:12	0	0	2	0	0	0
9:13	1	0	1	0	2	0
9:14	0	0	0	0	2	0
Total	145	2	18	0	48	18
Highest Queue:	5	2	2	0	5	4
Average Queue:	2	0	0	0	1	0

## Terminal Island East Ferry

### Ferry Terminal East Field Observations - Queue

Location: East Ferry Terminal / Terminal Island Road

Peak hour: 5:00 - 6:00 PM

Observer: Kansas & Nicole

Peak 15 min: 5:15 - 5:30 PM

Date: 10/6/2021

Observed:

Ferry Terminal East						
Time	Ferry Inbound			OutBound	Drop-off Lane	Terminal Island Road
	Terminal Island Road	Outbound Lane	Right Storage	garage outbound		
4:45	0	0	0	0	0	0
4:46	0	0	0	0	0	0
4:47	0	0	0	0	0	0
4:48	0	0	0	0	0	0
4:49	0	0	0	0	0	0
4:50	3	1	0	0	0	0
4:51	4	2	0	0	0	0
4:52	1	0	0	0	0	0
4:53	0	0	0	0	0	0
4:54	0	0	0	0	0	0
4:55	0	0	0	0	0	0
4:56	0	0	0	0	0	0
4:57	1	0	0	0	0	0
4:58	0	0	0	0	0	0
4:59	0	0	0	0	0	0
5:00	0	0	0	0	0	0
5:01	0	0	0	0	0	0
5:02	0	0	0	0	0	0
5:03	0	0	0	0	0	0
5:04	0	0	0	0	0	0
5:05	0	0	0	0	0	0
5:06	0	0	0	0	0	0
5:07	0	0	0	0	0	0
5:08	0	0	0	0	0	0
5:09	0	0	0	0	0	0
5:10	3	0	0	0	0	0
5:11	4	0	0	0	0	0
5:12	2	0	0	0	0	0
5:13	5	0	0	0	0	0
5:14	0	0	0	0	0	0

### Ferry Terminal East Field Observations - Queue

Location: East Ferry Terminal / Terminal Island Road

Peak hour: 5:00 - 6:00 PM

Observer: Kansas & Nicole

Peak 15 min: 5:15 - 5:30 PM

Date: 10/6/2021

Observed:

Ferry Terminal East						
Time	Ferry Inbound			OutBound	Drop-off Lane	Terminal Island Road
	Terminal Island Road	Outbound Lane	Right Storage	garage outbound		
5:15	0	0	0	0	0	0
5:16	0	0	0	0	0	0
5:17	0	0	0	0	0	0
5:18	0	0	0	0	0	0
5:19	0	0	0	0	0	0
5:20	0	0	0	0	0	0
5:21	0	0	0	0	0	0
5:22	0	0	0	0	0	0
5:23	0	0	0	0	0	0
5:24	0	0	0	0	0	0
5:25	1	0	0	0	0	0
5:26	0	0	0	0	0	0
5:27	0	0	0	0	0	0
5:28	0	0	0	0	0	0
5:29	0	0	0	0	0	0
5:30	0	0	0	0	0	0
5:31	0	0	0	0	0	0
5:32	0	0	0	0	0	0
5:33	0	0	0	0	0	0
5:34	0	0	0	0	0	0
5:35	0	0	0	0	0	0
5:36	0	0	0	0	0	0
5:37	0	0	0	0	0	0
5:38	0	0	0	0	0	0
5:39	0	1	0	0	0	0
5:40	0	0	0	0	0	0
5:41	7	0	0	1	0	0
5:42	0	0	0	1	0	0
5:43	0	0	0	1	0	0
5:44	0	0	0	0	0	0

### Ferry Terminal East Field Observations - Queue

Location: East Ferry Terminal / Terminal Island Road

Peak hour: 5:00 - 6:00 PM

Observer: Kansas & Nicole

Peak 15 min: 5:15 - 5:30 PM

Date: 10/6/2021

Observed:

Ferry Terminal East						
Time	Ferry Inbound			OutBound	Drop-off Lane	Terminal Island Road
	Terminal Island Road	Outbound Lane	Right Storage	garage outbound		
5:45	0	0	0	0	0	0
5:46	0	0	0	0	0	0
5:47	0	0	0	0	0	0
5:48	0	0	0	0	0	0
5:49	0	0	0	0	0	0
5:50	0	0	0	0	0	0
5:51	0	0	0	0	0	0
5:52	0	0	0	0	0	0
5:53	0	0	0	0	0	0
5:54	0	0	0	0	0	0
5:55	0	0	0	0	0	0
5:56	0	0	0	0	0	0
5:57	0	0	0	0	0	0
5:58	0	0	0	0	0	0
5:59	0	0	0	0	0	0
6:00	0	0	0	0	0	0
6:01	0	0	0	0	0	0
6:02	0	0	0	0	0	0
6:03	0	0	0	0	0	0
6:04	0	0	0	0	0	0
6:05	0	0	0	0	0	0
6:06	0	0	0	0	0	0
6:07	0	0	0	0	0	0
6:08	0	0	0	0	0	0
6:09	0	0	0	0	0	0
6:10	0	0	0	0	0	0
6:11	0	0	0	0	0	0
6:12	0	0	0	0	0	0
6:13	0	0	0	0	0	0
6:14	0	0	0	0	0	0
Total	31	4	0	3	0	0
Highest Queue:	7	2	0	1	0	0
Average Queue:	0	0	0	0	0	0













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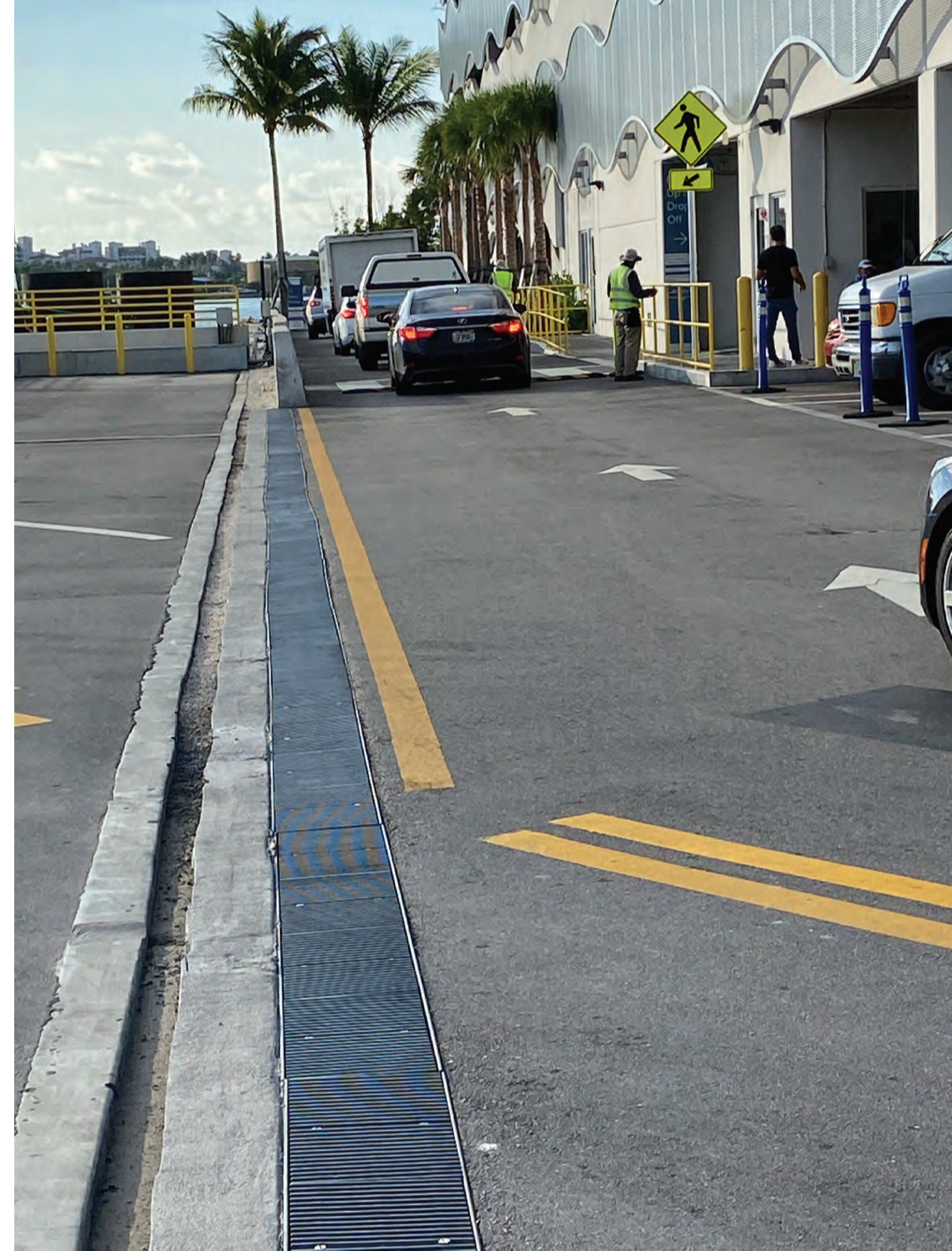












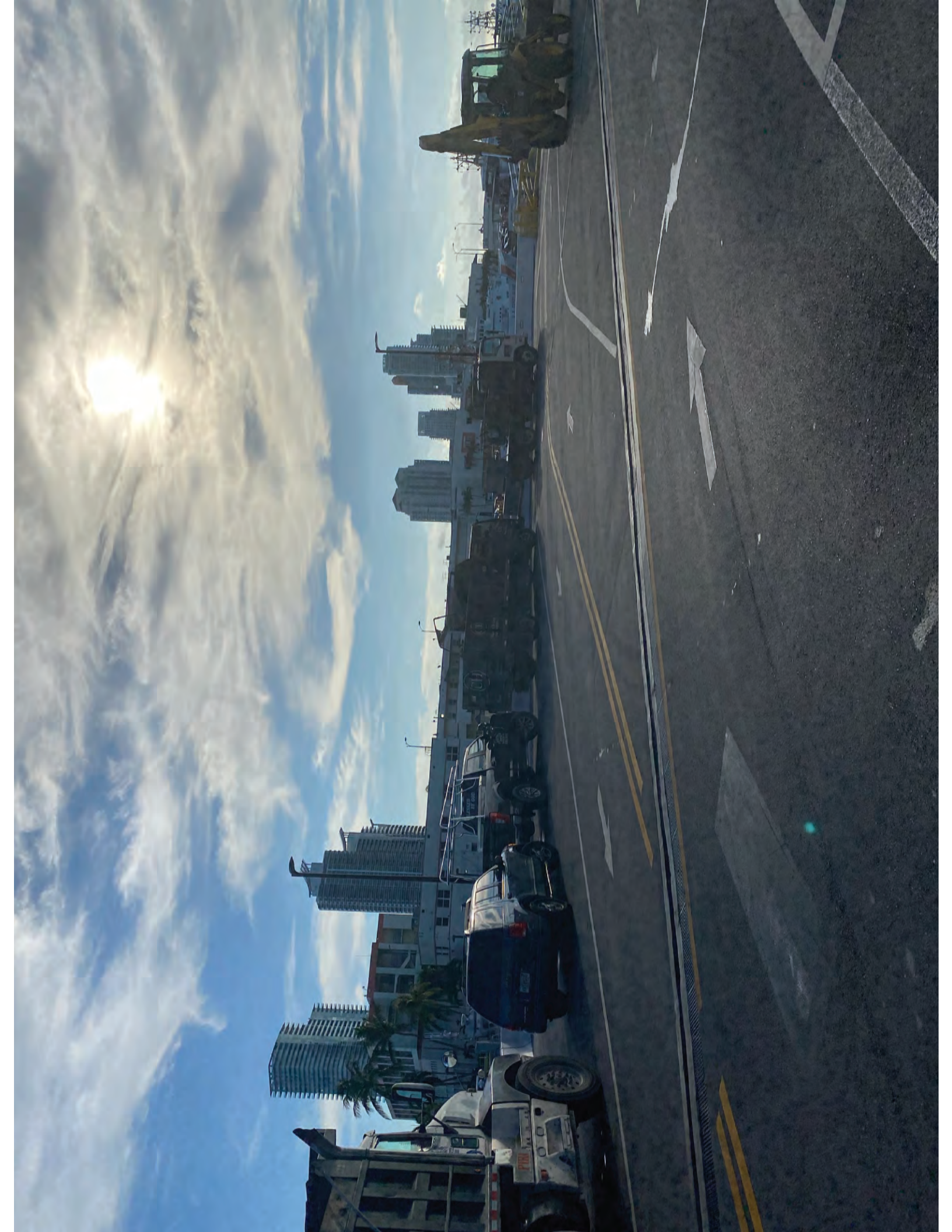








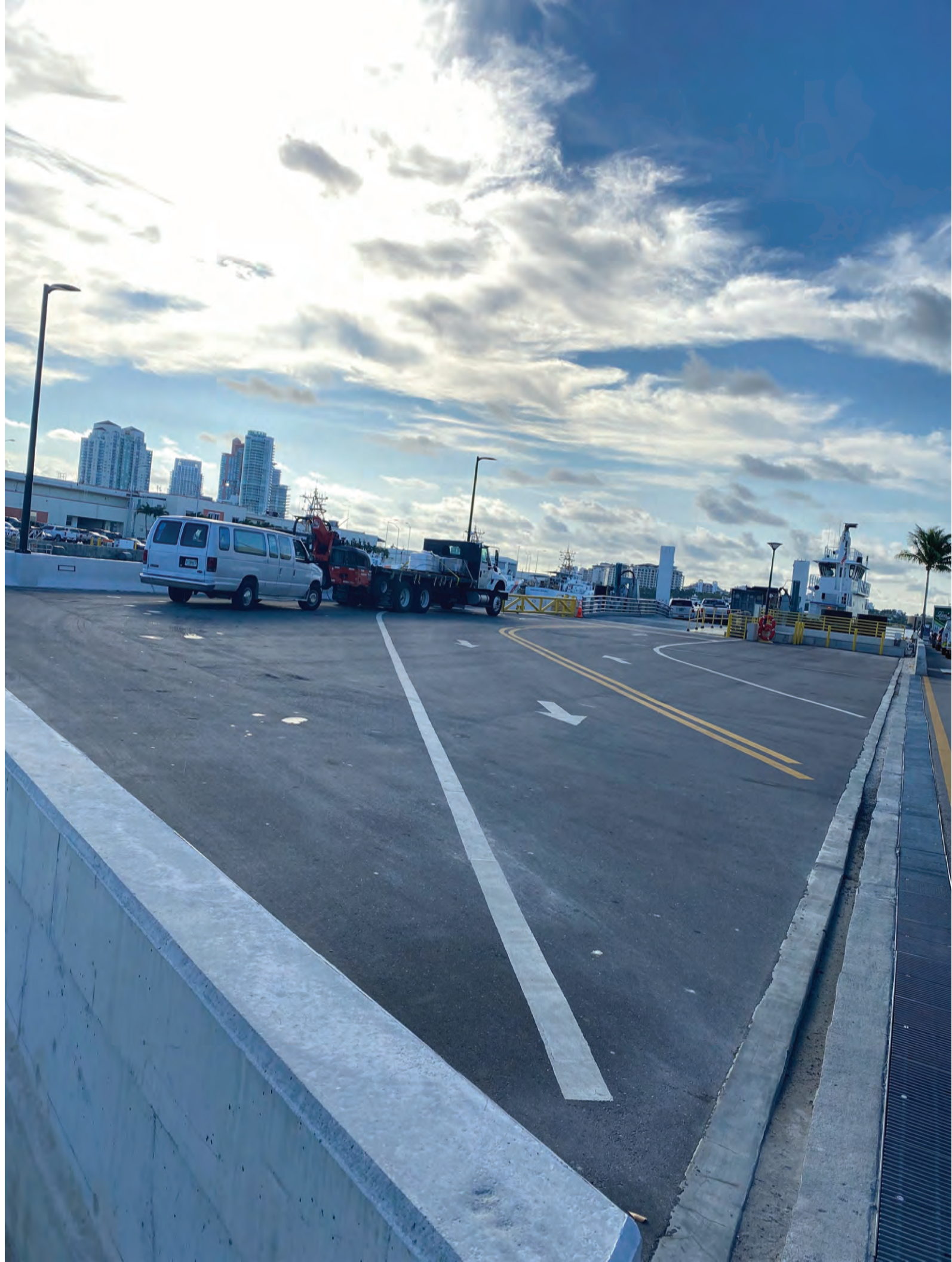












































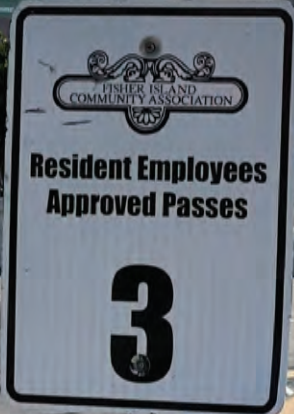
THE BEACH  
COMMUNITY ASSOCIATION  
Resident Guests  
Diamond Passes  
2





Property Owners  
Equity Members  
1





**Resident Employees  
Approved Passes**

**3**

