

Kingsdale Shopping Center Redevelopment

Traffic Impact Study

Prepared for: Continental Real Estate Companies
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I. Purpose of Report & Study Objectives

The purpose of this traffic analysis and report is to document the potential traffic impacts of the proposed expansion and redevelopment of the Kingsdale Shopping Center located in Upper Arlington, Ohio. This traffic impact study (TIS) is being required by City of Upper Arlington as part of the development approval process. A Memorandum of Understanding (MOU) was submitted and approved by the City of Upper Arlington. Said MOU can be found in **Appendix A**.

II. Proposed Development

A. Off-Site Developments

The study area is bounded by Tremont Road to the west, Zollinger Road to the south, Northwest Boulevard to the east, and Fishinger Road to the north. The surrounding area consists of residential developments in all directions, restaurants and banks to the north, and the existing Kingsdale Shopping Center development to the south.

B. On-Site Development

Location

The site is located within the existing Kingsdale Shopping Center, on the north end of the development. **Figure 1** shows the location of the proposed site in central Ohio and **Figure 2** shows the study area.

Figure 1 – Location in Central Ohio

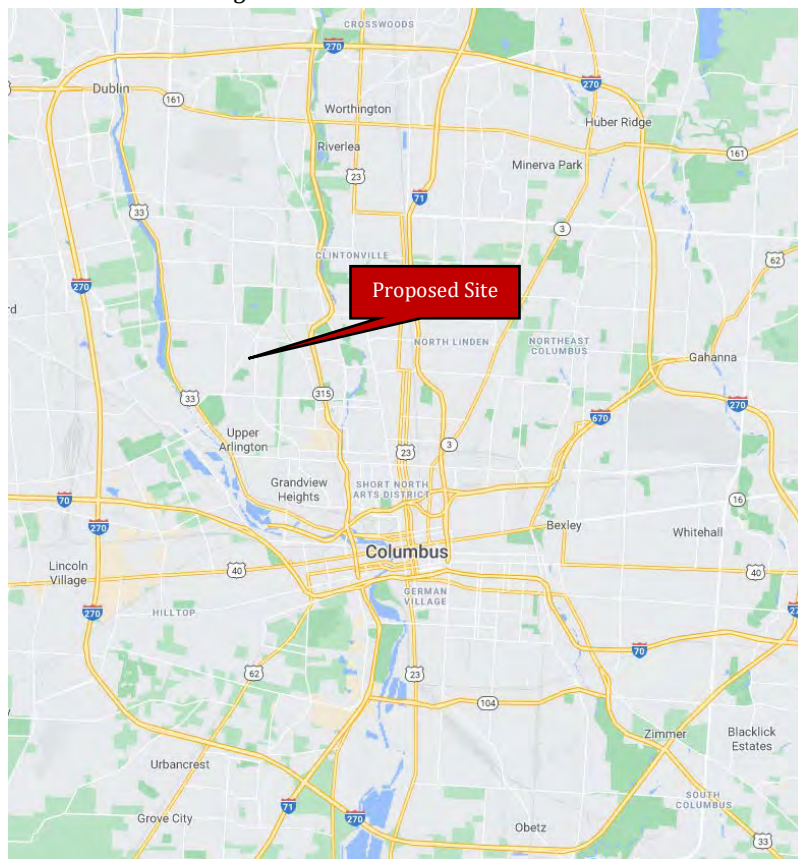


Figure 2 – Location of the Proposed Development (Yellow), Site Drive, and Study Intersections



Land Use & Intensity

The site is currently an unused section of the existing Kingsdale Shopping Center. It is proposed to be redeveloped as a mixed-use residential and retail development with the following approximation of uses and sizes: 363 apartment units located in a mid-rise building, assisted living facility with 52 beds, 52 units of attached senior housing, 30,000 SF of office space, 6,000 SF restaurant, and 100,000 SF community center.

The site plan is provided in **Appendix A**.

III. Area Conditions

A. Area of Influence

The study intersections for the proposed development are listed below. Numbers correspond to **Figure 2**.

1. Fishinger Road & Tremont Road & Northwest Boulevard
2. Tremont Road & Ridgecliff Road
3. Tremont Road & Milden Road
4. Tremont Road & Zollinger Road
5. Northwest Boulevard & Zollinger Road
6. Northwest Boulevard & Kingsdale Shopping Center Signal
7. Northwest Boulevard & Trentwood Road

B. Jurisdictions

The proposed site and all study intersections fall within City of Upper Arlington jurisdiction.

C. Traffic Volumes

Peak hour turning movement count data was collected at all study intersections in August 2020, with the exception of the 5-point intersection of Fishinger Road & Tremont Road & Northwest Boulevard. An existing count collected at this intersection in January 2020 was found on the Mid-Ohio Regional Planning Commission (MORPC) Transportation Data Management System (TDMS).

Traffic patterns were still impacted by the COVID-19 pandemic at the time of the August 2020 data collection. The count from the Fishinger Road & Tremont Road & Northwest Boulevard intersection, which was collected in January 2020 prior to any closures caused by the pandemic, was used as a baseline to adjust the other counts to 'pre-pandemic' volumes. An adjustment factor of 1.4 for the AM Peak hour and 1.15 for the PM Peak hour was utilized. All count data can be found in **Appendix B**.

IV. Projected Traffic

A. Background Traffic

For analysis, the Opening Year of the development is 2022 and the Design, or Horizon Year, is 2032. In order to project the count data to the Opening and Horizon Years, growth rates were calculated using historic counts from the intersections of Tremont Road & Milden Road, Tremont Road & Zollinger Road, and Northwest Boulevard & Zollinger Road and the adjusted 2020 counts. As the calculated growth rates were all negative, a blanket growth rate of 0.5% was used in order to be conservative. This growth rate was applied to the adjusted count data to develop Background, or No Build, traffic for the Opening and Horizon Years. Historic count data and growth rate calculations can be found in **Appendix B**.

B. Site Traffic

Trip Generation

Trips for the proposed site were generated using standard Institute of Transportation Engineers (ITE) practices and the *Trip Generation Manual*, 10th edition, data via the OTISS program¹. Land Use Codes (*LUC*) 221 – Multifamily Housing (Mid-Rise), 252 – Senior Adult Housing – Attached, 254 – Assisted Living, 495 – Recreational Community Center, 710 – General Office Building, and 932 – High-Turnover (Sit-Down) Restaurant were used to generate trips

¹ Online Traffic Impact Study Software developed by ITE and Transoft Solutions.

for the proposed development. **Table 1** shows the trip generation. The full trip generation details can be found in **Appendix C**. Trip generation for the proposed site was preapproved by the City of Upper Arlington prior to any analysis being completed.

Table 1 – Proposed Site Trip Generation Summary

Land Use	Size	AM Peak		PM Peak	
		Entry	Exit	Entry	Exit
221 – Mid-Rise Residential with 1st-Floor Commercial	363 Dwelling Units	31	90	93	60
Internal Capture		0	2	2	3
Pass-By		0	0	0	0
Non-Pass-By		31	88	91	57
254 – Assisted Living	52 Beds	6	4	5	8
Internal Capture		0	0	0	1
Pass-By		0	0	0	0
Non-Pass-By		6	4	5	7
252 – Senior Adult Housing - Attached	52 Dwelling Units	4	7	8	7
Internal Capture		0	0	0	0
Pass-By		0	0	0	0
Non-Pass-By		4	7	8	7
932 – High-Turnover (Sit-Down) Restaurant	6,000 SF Gross Floor Area	33	2	36	22
Internal Capture		7	7	5	4
Pass-By		0	0	13	8
Non-Pass-By		26	20	18	10
495 – Recreational Community Center	100,000 SF Gross Floor Area	122	63	115	130
Internal Capture		0	0	2	2
Pass-By		0	0	0	0
Non-Pass-By		122	63	113	128
710 – General Office Building	30,000 SF Gross Floor Area	47	8	6	30
Internal Capture		7	5	2	1
Pass-By		0	0	0	0
Non-Pass-By		40	3	4	29
Total		243	199	263	257
Internal Capture		14	14	11	11
Pass-By		0	0	13	8
Non-Pass-By		229	185	239	238

Site traffic was distributed to/from the site based on count data, knowledge of the surrounding area, and engineering judgement. Site traffic was added to No Build traffic to produce Build traffic volumes for the Opening and Horizon Years. The full volume calculations can be found in **Appendix D**.

V. Traffic Analysis

A. Turn Lane Warrant Analysis

Turn lane warrant analyses were conducted at unsignalized study intersections using standard ODOT turn lane warrant graphs. If a turn lane was warranted in any particular scenario, the length was calculated using methodologies in the ODOT Location and Design (L&D) Manual and it was represented as such in the capacity analysis.

B. Capacity Analysis

The HCM 6th Edition module of Synchro Version 10 software was used to analyze capacity at the intersections of Tremont Road with Ridgecliff Road, Milden Road, and Zollinger Road, and Northwest Boulevard with Zollinger Road and Trentwood Road. The intersections of Fishinger Road & Tremont Road & Northwest Boulevard and Northwest Boulevard & Kingsdale Shopping Center Signal were analyzed using the Synchro output due to the intersection configurations and phasing not being supported by HCM methodologies.

A minimum LOS of D for the overall intersection/approaches and LOS E for each individual movement during peak traffic hours was considered acceptable. If an intersection fell below these criteria, mitigation strategies were developed to bring each movement or intersection back to an acceptable LOS.

C. Queuing Analysis

The SimTraffic module of Synchro 10 was used to perform queuing analysis at the study intersections. Results were generated based on the average of five runs. If queuing issues were present, mitigation strategies were developed to reduce queuing.

VI. Results

A. Turn Lane Warrant Analysis

Results of the turn lane warrant analysis show that a 100' southbound left turn lane is warranted at the intersection of Tremont Road & Ridgecliff Road in both the Opening and Horizon Year Build scenarios. A 125' southbound left turn lane is also warranted at the intersection of Northwest Boulevard & Trentwood Road in all Build and No Build scenarios. All turn lane lengths are inclusive of a 50' diverging taper. The full turn lane warrant analysis and length calculations can be found in **Appendix E**.

B. Capacity Analysis

Results of the capacity analysis can be seen in **Table 2**. Baseline analysis assumes existing signal clearance intervals and lane configurations/stop-control. An AM peak cycle length of 100 seconds and PM peak cycle length of 120 seconds was assumed at all intersections except for the intersection of Fishinger Road & Tremont Road & Northwest Boulevard, which was assumed to have a cycle length of 140 seconds during both peaks. The warranted southbound left turn lane at the intersection of Tremont Road & Ridgecliff Road was assumed to be installed in the Build scenarios.

The total delay for stop-controlled intersections is represented by the worst approach LOS. Red text signifies an approach and/or movement delay that exceeds acceptable LOS standards. The full capacity analysis can be found in **Appendix F**.

Table 2 – Baseline Capacity Analysis Summary

Intersection	Approach	Opening Year				Horizon Year			
		AM No Build	AM Build	PM No Build	PM Build	AM No Build	AM Build	PM No Build	PM Build
Fishinger Rd & Tremont Rd & Northwest Blvd	Eastbound	F/86.9	F/97.0	D/52.0	E/55.6	F/101.1	F/112.2	E/55.6	E/57.0
	Westbound	E/66.2	F/86.0	D/54.8	E/67.6	E/71.4	F/92.9	E/60.6	E/71.4
	Northbound	D/49.9	D/50.5	D/54.5	E/55.0	D/51.2	D/51.3	D/54.1	E/61.5
	Southbound	D/43.5	D/49.2	D/35.5	D/39.4	D/45.8	D/53.6	D/36.7	D/41.5
	Northwest Bound	C/33.3	C/34.2	C/34.9	D/35.7	C/33.6	C/34.4	D/35.1	D/35.8
	Total	E/63.7	E/70.9	D/47.5	D/52.4	E/70.6	E/78.7	D/50.0	E/55.3
Tremont Rd & Ridgecliff Rd	Eastbound	C/15.1	C/21.8	C/16.2	D/25.4	C/15.8	C/23.5	C/17.0	D/27.6
	Westbound	---	C/19.2	---	D/27.3	---	C/20.3	---	D/29.9
	Northbound	A/0.2	A/0.1	A/0.3	A/0.3	A/0.1	A/0.1	A/0.3	A/0.3
	Southbound	A/0.2	A/1.0	A/0.0	A/1.0	A/0.0	A/0.9	A/0.0	A/1.0
	Total	C/15.1	C/21.8	C/16.2	D/27.3	C/15.8	C/23.5	C/17.0	D/29.9
Tremont Rd & Milden Rd	Eastbound	D/42.3	D/42.0	E/55.3	D/54.2	D/42.2	D/42.1	E/55.3	D/54.3
	Westbound	D/42.5	D/42.6	D/53.9	D/50.5	D/42.5	D/42.6	D/53.0	D/50.1
	Northbound	A/0.4	A/0.5	A/0.4	A/0.6	A/0.4	A/0.5	A/0.5	A/0.6
	Southbound	A/2.2	A/2.4	A/2.7	A/3.9	A/2.2	A/2.4	A/3.0	A/4.2
	Total	A/5.7	A/6.3	B/12.2	B/12.1	A/8.5	A/6.3	B/12.2	B/12.2
Tremont Rd & Zollinger Rd	Eastbound	D/38.6	D/37.2	D/41.2	D/40.1	D/38.1	D/36.7	D/40.5	D/39.4
	Westbound	D/42.4	D/40.5	D/49.4	D/46.7	D/42.0	D/40.1	D/48.9	D/46.3
	Northbound	A/5.2	A/6.4	A/9.5	B/11.7	A/5.6	A/6.9	B/10.2	B/12.5
	Southbound	A/0.3	A/0.5	A/0.8	A/1.2	A/0.4	A/0.6	A/0.9	A/1.4
	Total	B/19.8	B/18.5	C/22.4	C/21.4	B/19.7	B/18.5	C/22.3	C/21.4
Northwest Blvd & Zollinger Rd	Eastbound	D/49.2	D/49.3	E/62.5	E/63.7	D/51.8	D/51.9	E/63.3	E/66.2
	Westbound	D/50.8	D/49.7	E/57.6	E/57.7	D/50.6	D/49.5	E/57.1	E/57.7
	Northbound	B/18.0	B/18.4	C/26.0	C/27.2	B/18.6	B/19.1	C/26.4	C/29.1
	Southbound	D/43.3	D/44.8	E/55.4	E/57.0	D/43.6	D/45.2	E/57.7	E/56.5
	Total	D/37.0	D/37.1	D/48.3	D/49.3	D/37.8	D/38.0	D/49.3	D/50.3
Northwest Blvd & Kingsdale Shopping Center Signal	Eastbound	D/45.7	D/35.8	D/53.9	D/44.5	D/45.9	D/36.0	D/53.6	D/44.5
	Northbound	A/5.7	A/7.8	B/12.4	B/16.8	A/6.0	A/8.3	B/13.0	B/17.6
	Southbound	A/1.3	A/1.7	A/2.9	A/3.0	A/1.4	A/1.7	A/3.0	A/3.3
	Total	A/6.8	B/10.3	B/16.6	B/18.8	A/6.9	B/10.5	B/16.8	B/19.1
Northwest Blvd & Trentwood Rd	Westbound	B/10.8	B/11.6	B/14.4	C/16.1	B/11.0	B/11.8	C/15.0	C/16.9
	Northbound	A/0.0	A/0.0	A/0.0	A/0.0	A/0.0	A/0.0	A/0.0	A/0.0
	Southbound	A/0.5	A/0.5	A/0.6	A/0.5	A/0.6	A/0.5	A/0.6	A/0.5
	Total	B/10.8	B/11.6	B/14.4	C/16.1	B/11.0	B/11.8	C/15.0	C/16.9

As seen above in **Table 2**, the intersection of Fishinger Road & Tremont Road & Northwest Boulevard has failing LOS in all scenarios except for the Opening Year PM No Build scenario. The intersection of Northwest Boulevard & Zollinger Road has failing LOS in all PM scenarios. Thus, intersection improvements are required for both intersections.

The intersection of Tremont Road & Milden Road experienced failing LOS in both PM No Build scenarios. However, the delay is only 0.3 seconds outside of acceptable and the addition of Build traffic allows the intersection to achieve acceptable standards. No mitigation was attempted for this intersection.

All other intersections maintained acceptable LOS in all scenarios. Improvements needed at each intersection to meet LOS requirements in each scenario are summarized in **Table 3**.

Table 3 – Improvements Summary

Intersection	Opening Year		Horizon Year	
	No Build	Build	No Build	Build
Fishinger Rd & Tremont Rd & Northwest Blvd	Add 465' EBR turn lane	Add 390' EBR turn lane Add slip EBR turn lane	Add 365' EBR turn lane Add slip EBR turn lane	Add third EBT Add 490' EBR turn lane
Northwest Blvd & Zollinger Rd	Remove split phasing for EB/WB approaches	Remove split phasing for EB/WB approaches	Remove split phasing for EB/WB approaches	Remove split phasing for EB/WB approaches

Capacity analysis was conducted assuming the improvements listed in **Table 3** are implemented. Results of the capacity analysis with improvements can be seen in **Table 4**. The full capacity analysis with improvements can be found in **Appendix F**.

Table 4 – Capacity Analysis with Improvements Summary

Intersection	Approach	Opening Year				Horizon Year			
		AM No Build	AM Build	PM No Build	PM Build	AM No Build	AM Build	PM No Build	PM Build
Fishinger Rd & Tremont Rd & Northwest Blvd	Eastbound	D/53.8	D/52.8	D/52.8	D/42.8	D/54.8	D/54.6	D/45.1	D/53.6
	Westbound	D/54.6	D/54.2	D/54.1	D/54.9	D/54.8	D/54.4	D/54.5	D/54.9
	Northbound	D/50.2	D/50.2	D/51.5	D/51.2	D/50.8	D/50.8	D/53.0	D/54.5
	Southbound	D/43.3	D/45.8	C/34.2	D/38.1	D/46.0	D/46.2	D/35.2	D/42.9
	Northwest Bound	C/33.3	C/34.2	C/35.0	D/35.7	C/33.6	C/34.4	D/35.1	D/35.8
	Total	D/49.1	D/49.0	D/46.7	D/45.5	D/50.2	D/50.0	D/45.7	D/49.1
Northwest Blvd & Zollinger Rd	Eastbound	D/43.1	D/43.1	D/51.2	D/37.5	D/47.0	D/47.1	D/47.1	D/37.0
	Westbound	D/40.9	D/40.7	D/41.3	D/43.1	D/40.1	D/40.0	D/41.1	D/42.6
	Northbound	B/16.2	B/17.2	C/26.1	C/26.1	B/16.9	B/17.9	C/26.0	C/27.7
	Southbound	D/38.4	D/38.7	D/47.6	D/48.4	D/38.6	D/38.9	D/49.0	D/48.1
	Total	C/32.1	C/32.3	D/40.8	D/38.2	C/33.3	C/33.4	D/40.1	D/38.4

As can be seen in **Table 4**, the improvements outlined in **Table 3** result in acceptable LOS for all scenarios.

C. Queuing Analysis

Baseline queuing analysis can be seen in **Tables 5 and 6**. Average and 95th percentile queues are shown for each lane of each study intersection along with the approximate available storage space. Queues that exceed available storage space are shown in red. The full queuing analysis can be found in **Appendix G**.

Table 5 – Opening Year Baseline Queuing Analysis Summary (Average/95th Percentile)

Intersection	Approach	Movement	Available Storage Space	AM No Build	AM Build	PM No Build	PM Build	
Fishinger Rd & Tremont Rd & Northwest Blvd	Eastbound	L	175'	157'/257'	148'/252'	75'/150'	89'/191'	
		T	680'	743'/1188'	877'/1347'	151'/249'	263'/490'	
		T/R/Hard R	680'	723'/1172'	860'/1322'	201'/302'	373'/623'	
	Westbound	Hard L/L	175'	160'/247'	189'/238'	164'/247'	187'/241'	
		T	780'	281'/658'	567'/1034'	298'/570'	451'/802'	
		T/R	780'	237'/611'	487'/976'	248'/512'	385'/731'	
	Northbound	L	140'	54'/145'	75'/175'	128'/215'	162'/174'	
		T	250'	132'/288'	170'/347'	241'/404'	315'/387'	
		R	200'	145'/236'	145'/251'	98'/243'	147'/302'	
	Southbound	Slip R	85'	0'/0'	0'/0'	0'/0'	0'/0'	
		Hard L/L	120'	135'/168'	141'/157'	106'/167'	113'/176'	
		T	600'	572'/1187'	949'/1487'	220'/405'	279'/525'	
	Northwest Bound	R	120'	59'/152'	55'/146'	80'/163'	88'/177'	
		Hard L/L	575'	30'/70'	42'/83'	65'/118'	64'/125'	
L		575'	24'/64'	33'/78'	71'/128'	65'/134'		
Tremont Rd & Ridgecliff Rd	Eastbound	R	170'	16'/55'	24'/71'	34'/95'	31'/94'	
		Slip R	85'	0'/0'	0'/0'	0'/0'	1'/17'	
	Westbound	L/R	950'	19'/43'	---	41'/166'	---	
		L/T/R	950'	---	21'/45'	---	72'/204'	
	Northbound	L/T/R	N/A	---	36'/71'	---	172'/387'	
		L	220'	2'/15'	1'/7'	15'/92'	26'/137'	
	Southbound	T	455'	0'/0'	---	39'/234'	---	
		T/R	455'	---	0'/0'	---	206'/541'	
	Tremont Rd & Mildred Rd	Eastbound	L	100'	---	7'/23'	---	10'/31'
			T/R	780'	0'/0'	0'/0'	0'/0'	0'/0'
Westbound		L/T/R	740'	22'/54'	22'/53'	38'/85'	51'/118'	
		L/T	70'	19'/49'	38'/85'	75'/151'	112'/230'	
Northbound		R	35'	20'/54'	25'/61'	43'/70'	43'/70'	
		L	100'	2'/12'	2'/12'	7'/28'	10'/55'	
Southbound		T/R	860'	46'/119'	62'/137'	101'/290'	254'/695'	
		L	145'	15'/43'	19'/48'	33'/79'	36'/88'	
Tremont Rd & Zollinger Rd	Eastbound	T/R	455'	24'/87'	29'/87'	51'/130'	72'/171'	
		L	65'	46'/94'	56'/101'	48'/97'	62'/103'	
		T	1775'	60'/123'	66'/149'	53'/122'	81'/222'	
	Westbound	T/R	1775'	51'/102'	56'/116'	58'/120'	70'/180'	
		L	130'	9'/38'	13'/38'	49'/137'	36'/113'	
	Northbound	T/R	1410'	62'/124'	60'/114'	145'/253'	158'/300'	
		L	75'	3'/15'	4'/21'	12'/42'	18'/64'	
	Southbound	T/R	915'	34'/89'	40'/106'	72'/160'	108'/206'	
		L	100'	7'/31'	9'/35'	13'/52'	14'/62'	
	Northwest Blvd & Zollinger Rd	Eastbound	T/R	860'	32'/103'	38'/119'	80'/179'	121'/250'
			L/T	1410'	47'/93'	53'/106'	88'/155'	89'/143'
		Westbound	T/R	1430'	59'/123'	62'/122'	87'/159'	90'/157'
L/T			240'	69'/129'	69'/121'	101'/176'	100'/174'	
Northbound		R	240'	10'/31'	19'/43'	26'/53'	29'/55'	
		L/T	1485'	76'/134'	85'/153'	107'/179'	131'/215'	
Southbound		T/R	1485'	48'/103'	54'/110'	85'/154'	104'/190'	
		L/T	1000'	55'/101'	64'/110'	110'/172'	122'/185'	
Northwest Blvd & Kingsdale Shopping Center Signal	Eastbound	T/R	1000'	62'/114'	72'/122'	109'/180'	125'/197'	
		L	150'	29'/62'	47'/91'	87'/138'	105'/150'	
	Northbound	R	150'	5'/22'	24'/48'	30'/107'	84'/227'	
		L/T	1000'	24'/62'	42'/90'	57'/114'	91'/167'	
	Southbound	T	1000'	20'/64'	36'/89'	69'/144'	87'/171'	
		T/R	450'	6'/27'	11'/38'	16'/51'	21'/60'	
Northwest Blvd & Trentwood Rd	Westbound	T/R	450'	13'/44'	25'/60'	32'/71'	42'/95'	
		L/R	300'	30'/55'	33'/59'	32'/54'	36'/62'	
	Northbound	T	450'	0'/0'	0'/0'	0'/3'	0'/0'	
		T/R	450'	0'/0'	0'/0'	0'/0'	0'/0'	
Southbound	L/T	575'	2'/16'	3'/17'	5'/25'	5'/25'		
	T	575'	0'/0'	0'/0'	0'/0'	6'/29'		

Table 6 – Horizon Year Baseline Queuing Analysis Summary (Average/95th Percentile)

Intersection	Approach	Movement	Available Storage Space	AM No Build	AM Build	PM No Build	PM Build	
Fishinger Rd & Tremont Rd & Northwest Blvd	Eastbound	L	175'	154'/260'	152'/259'	92'/186'	89'/182'	
		T	680'	868'/1300'	1039'/1332'	203'/358'	493'/1021'	
		T/R/Hard R	680'	846'/1295'	1031'/1345'	282'/458'	667'/1116'	
	Westbound	Hard L/L	175'	183'/242'	197'/217'	170'/249'	193'/226'	
		T	780'	375'/750'	656'/1061'	364'/751'	549'/994'	
		T/R	780'	328'/705'	507'/1018'	315'/693'	500'/950'	
	Northbound	L	140'	53'/141'	72'/167'	145'/211'	158'/195'	
		T	250'	117'/232'	140'/257'	279'/443'	355'/461'	
		R	200'	129'/218'	139'/239'	118'/272'	132'/298'	
	Southbound	Slip R	85'	3'/45'	16'/109'	0'/0'	0'/0'	
		Hard L/L	120'	138'/165'	141'/157'	113'/175'	115'/178'	
		T	600'	696'/1341'	839'/1495'	257'/474'	350'/720'	
	Northwest Bound	R	120'	56'/145'	54'/144'	86'/170'	93'/178'	
		Hard L/L	575'	44'/89'	60'/105'	74'/134'	69'/131'	
L		575'	36'/85'	59'/106'	74'/146'	69'/136'		
Tremont Rd & Ridgecliff Rd	Eastbound	R	170'	24'/68'	51'/102'	41'/109'	39'/122'	
		Slip R	85'	0'/0'	0'/0'	1'/20'	2'/25'	
	Westbound	L/R	950'	18'/43'	---	21'/47'	---	
		L/T/R	950'	---	24'/52'	---	89'/244'	
	Northbound	L/T/R	N/A	---	35'/70'	---	197'/411'	
		L	220'	2'/15'	2'/11'	6'/26'	37'/166'	
	Southbound	T	455'	0'/0'	---	23'/132'	---	
		T/R	455'	---	0'/7'	---	265'/603'	
	Tremont Rd & Mildred Rd	Eastbound	L	100'	---	5'/22'	---	8'/31'
			T/R	780'	0'/0'	0'/0'	0'/8'	0'/0'
Westbound		L/T/R	740'	21'/50'	27'/62'	42'/81'	72'/181'	
		L/T	70'	23'/58'	33'/73'	80'/165'	131'/267'	
Northbound		R	35'	26'/61'	24'/61'	46'/66'	48'/68'	
		L	100'	2'/14'	2'/14'	4'/19'	7'/43'	
Southbound		T/R	860'	47'/118'	65'/148'	82'/189'	441'/1035'	
		L	145'	17'/46'	17'/47'	35'/80'	36'/83'	
Tremont Road & Zollinger Road	Eastbound	T/R	455'	18'/65'	29'/93'	50'/128'	83'/186'	
		L	65'	49'/93'	56'/97'	52'/98'	67'/108'	
		T	1775'	64'/133'	61'/124'	60'/129'	131'/355'	
	Westbound	T/R	1775'	58'/110'	60'/111'	60'/120'	113'/309'	
		L	130'	12'/36'	13'/48'	43'/128'	53'/149'	
	Northbound	T/R	1410'	61'/111'	69'/139'	150'/259'	191'/402'	
		L	75'	3'/13'	5'/22'	13'/44'	20'/70'	
	Southbound	T/R	915'	35'/94'	47'/116'	82'/173'	134'/242'	
		L	100'	11'/44'	8'/31'	19'/71'	13'/53'	
	Northwest Blvd & Zollinger Rd	Eastbound	T/R	860'	29'/91'	38'/118'	85'/195'	123'/271'
L/T			1410'	48'/99'	49'/90'	81'/145'	99'/167'	
Westbound		T/R	1430'	62'/127'	61'/114'	93'/173'	104'/193'	
		L/T	240'	76'/141'	78'/139'	112'/192'	107'/177'	
Northbound		R	240'	11'/32'	20'/46'	29'/48'	34'/65'	
		L/T	1485'	78'/138'	91'/156'	114'/185'	137'/213'	
Southbound		T/R	1485'	52'/107'	55'/114'	92'/172'	109'/188'	
		L/T	1000'	53'/94'	69'/114'	118'/182'	122'/197'	
Northwest Blvd & Kingsdale Shopping Center Signal	Eastbound	T/R	1000'	61'/114'	77'/130'	117'/188'	125'/198'	
		L	150'	29'/61'	52'/99'	94'/147'	112'/154'	
	Northbound	R	150'	4'/21'	28'/63'	46'/152'	113'/284'	
		L/T	1000'	19'/53'	44'/85'	65'/125'	105'/182'	
	Southbound	T	1000'	24'/75'	32'/80'	70'/144'	97'/183'	
		T/R	450'	6'/27'	12'/39'	18'/55'	25'/67'	
Northwest Blvd & Trentwood Rd	Westbound	T/R	450'	12'/43'	22'/56'	34'/82'	40'/94'	
		L/R	300'	31'/54'	32'/58'	32'/56'	36'/63'	
	Northbound	T	450'	0'/0'	0'/0'	0'/0'	0'/5'	
		T/R	450'	0'/3'	0'/0'	0'/0'	0'/0'	
Southbound	L/T	575'	3'/19'	2'/17'	8'/31'	7'/29'		
	T	575'	9'/43'	0'/0'	0'/0'	0'/0'		

Horizon year queuing analysis assuming the improvements outlined in **Table 3** are implemented are summarized in **Table 7** below. The full queuing analysis with improvements can be found in **Appendix G**.

Table 7 – Horizon Year Queuing Analysis w/ Improvements Summary (Average/95th Percentile)

Intersection	Approach	Movement	Available Storage Space	AM No Build	AM Build	PM No Build	PM Build
Fishinger Rd & Tremont Rd & Northwest Blvd	Eastbound	L	175'	144'/252'	138'/243'	73'/135'	62'/125'
		T	680'	288'/411'	249'/353'	105'/167'	97'/162'
		R	365'/490'	78'/165'	---	103'/183'	---
		R/Hard R	680'	---	160'/275'	---	279'/487'
	Westbound	Slip R	85'	0'/3'	---	2'/16'	---
		Hard L/L	175'	63'/129'	69'/146'	167'/250'	193'/232'
		T	780'	84'/153'	67'/126'	283'/503'	665'/1086'
	Northbound	T/R	780'	47'/123'	39'/104'	238'/439'	567'/1041'
		L	140'	48'/126'	81'/175'	107'/197'	154'/206'
		T	250'	116'/230'	152'/285'	175'/324'	333'/483'
	Southbound	R	200'	132'/221'	127'/220'	77'/197'	131'/292'
		Slip R	85'	5'/55'	13'/97'	0'/0'	0'/0'
		Hard L/L	120'	141'/159'	140'/161'	110'/173'	128'/174'
	Northwest Bound	T	600'	751'/1331'	711'/1284'	243'/457'	743'/1324'
		R	120'	47'/134'	63'/158'	89'/173'	100'/187'
		Hard L/L	575'	38'/77'	63'/107'	76'/130'	73'/142'
L		575'	36'/88'	70'/125'	77'/141'	78'/144'	
Tremont Rd & Ridgecliff Rd	Eastbound	R	170'	25'/74'	61'/116'	40'/108'	44'/109'
		Slip R	85'	1'/12'	0'/0'	0'/0'	4'/38'
	Westbound	L/R	950'	19'/46'	---	20'/42'	---
		L/T/R	950'	---	21'/49'	---	65'/201'
Tremont Rd & Milden Rd	Northbound	L/T/R	N/A	---	33'/65'	---	131'/326'
		L	220'	3'/19'	1'/8'	8'/30'	22'/124'
	Southbound	T	455'	0'/0'	---	0'/0'	---
		T/R	455'	---	1'/9'	---	170'/507'
Tremont Rd & Zollinger Rd	Eastbound	L	100'	---	6'/21'	---	10'/34'
		T/R	780'	0'/0'	0'/0'	0'/0'	0'/0'
	Westbound	L/T/R	740'	21'/56'	24'/55'	46'/97'	52'/119'
		L/T	70'	25'/60'	40'/84'	72'/149'	110'/209'
	Northbound	R	35'	23'/58'	26'/61'	46'/65'	47'/70'
		L	100'	2'/14'	3'/14'	6'/37'	12'/58'
Southbound	T/R	860'	41'/112'	67'/154'	83'/192'	272'/781'	
	L	145'	21'/55'	21'/58'	40'/101'	41'/106'	
Northwest Blvd & Zollinger Rd	Eastbound	T/R	455'	27'/84'	33'/92'	58'/160'	66'/160'
		L	65'	46'/93'	58'/99'	49'/95'	69'/108'
		T	1775'	62'/125'	62'/136'	56'/128'	101'/256'
	Westbound	T/R	1775'	57'/109'	59'/115'	56'/120'	87'/213'
		L	130'	11'/34'	13'/48'	43'/125'	42'/123'
		T/R	1410'	65'/124'	72'/132'	159'/285'	149'/264'
	Northbound	L	75'	2'/11'	3'/15'	15'/51'	21'/73'
		T/R	915'	32'/89'	43'/110'	81'/175'	121'/219'
Southbound	L	100'	12'/52'	15'/55'	16'/60'	20'/75'	
	T/R	860'	40'/123'	49'/138'	88'/196'	115'/223'	
Northwest Blvd & Zollinger Rd	Eastbound	L/T	1410'	49'/90'	50'/93'	90'/152'	91'/154'
		T/R	1430'	58'/114'	56'/115'	97'/168'	97'/170'
	Westbound	L/T	240'	73'/134'	64'/118'	99'/175'	101'/176'
		R	240'	11'/33'	19'/43'	25'/48'	27'/52'
	Northbound	L/T	1485'	70'/123'	83'/145'	104'/182'	127'/200'
		T/R	1485'	47'/103'	52'/106'	82'/152'	97'/174'
	Southbound	L/T	1000'	47'/95'	61'/110'	108'/173'	111'/180'
		T/R	1000'	58'/109'	71'/122'	107'/180'	110'/182'

Table 7 – Horizon Year Queuing Analysis Summary w/ Improvements cont'd (Average/95th Percentile)

Intersection	Approach	Movement	Available Storage Space	AM No Build	AM Build	PM No Build	PM Build
Northwest Blvd & Kingsdale Shopping Center Signal	Eastbound	L	150'	29'/64'	54'/102'	94'/144'	115'/153'
		R	150'	4'/20'	25'/65'	46'/147'	114'/271'
	Northbound	L/T	1000'	22'/63'	50'/93'	63'/122'	106'/197'
		T	1000'	22'/70'	44'/96'	75'/150'	99'/188'
	Southbound	T	450'	9'/33'	15'/46'	23'/60'	23'/67'
		T/R	450'	16'/50'	26'/63'	35'/83'	45'/99'
Northwest Blvd & Trentwood Rd	Westbound	L/R	300'	30'/50'	33'/54'	33'/59'	37'/64'
		T	450'	0'/0'	0'/0'	0'/0'	0'/0'
	Northbound	T/R	450'	0'/0'	0'/0'	0'/3'	0'/0'
		L/T	575'	4'/22'	4'/20'	8'/33'	8'/29'
	Southbound	T	575'	0'/0'	0'/0'	2'/21'	0'/0'

VII. Recommendations and Conclusions

Based on the results of the turn lane warrant analysis, it is recommended that a 100' southbound left turn lane be installed at Tremont Road & Ridgecliff Road as a Build improvement. Additionally, it is recommended that a 125' southbound left turn lane be installed at the Trentwood Road & Northwest Boulevard as a No Build improvement.

Based on the results of the capacity and queuing analysis, it is recommended that an eastbound right turn lane be installed at the Fishinger Road & Tremont Road & Northwest Boulevard intersection as a No Build improvement. The analysis shows that a second right turn lane is required on this approach to achieve acceptable LOS. However, this is not recommended due to right-of-way constraints and the close proximity of the existing Fifth Third Bank. It is recommended that the existing split-phasing at the Northwest Boulevard & Zollinger Road intersection be changed to traditional NEMA phasing in order to achieve acceptable LOS in No Build and Build conditions. This is a No Build improvement.

No additional improvements are required and thus, none are recommended.

VIII. Appendices

- Appendix A – MOU & Site Plan
- Appendix B – Count Data and Growth Rate Calculations
- Appendix C – Trip Generation
- Appendix D – Volume Calculations
- Appendix E – Turn Lane Warrants
- Appendix F – Capacity Analysis
- Appendix G – Queuing Analysis

Appendix A

MOU & Site Plan



August 17, 2020

Traffic Impact Study Memorandum of Understanding

Re: Proposed Kingsdale Shopping Center Expansion TIS

Between: The City of Upper Arlington and Carpenter Marty Transportation

Carpenter Marty Transportation (CM) has been retained to complete a traffic impact study (TIS) for a proposed expansion of the Kingsdale Shopping Center in Upper Arlington, OH. The development is proposed to be mixed-use and include senior housing, multifamily housing, ground floor commercial, a community center and/or office, and a parking garage. The purpose of this Memorandum of Understanding (MOU) is to establish a mutually agreeable scope for a TIS of the proposed development. The proposed study scope, based on a conference call with the City of Upper Arlington, is below.

Proposed TIS Scope

- There are currently significant traffic volume changes caused by the COVID-19 pandemic. Therefore, traffic counts may need adjusted and/or alternative methods must be utilized to develop traffic volumes. CM is proposing to obtain AM Peak and PM Peak traffic volumes and perform analysis at the below listed intersections. Some counts are available via online resources. Others will be collected by CM and adjusted based on pre-COVID-19 count data obtained at the Fishinger Road/Tremont Road/Northwest Boulevard intersection.
 - Fishinger Road/Tremont Road/Northwest Boulevard (January 2020 data available via online resources)
 - Trentwood Road & Northwest Boulevard (to be collected by CM)
 - Tremont Road & Ridgecliff Road/Proposed Site Access (to be collected by CM)
 - Northwest Boulevard & Existing, Signalized Full Access to Kingsdale Shopping Center (to be collected by CM)
 - Tremont Road & Mildew Road (to be collected by CM)
 - Tremont Road & Zollinger Road (to be collected by CM)
 - Northwest Boulevard & Zollinger Road (to be collected by CM)
- Trip Generation – Generate trips for the proposed development using ITE Trip Generation standards and the OTISS program. Trips will be assigned to the proposed site access points according to a distribution determined from counts, area knowledge/travel patterns, and engineering judgment. ITE recommended pass-by and internal capture trip reductions will be applied. Trip generation is not being provided at this time as the site plan and specific uses are still developing. However, trip generation will be provided for preapproval prior to analysis being completed.
- Volume Development - Develop Opening Year (2022) and Horizon Year (2032) traffic plates for Build and No Build, AM and PM Peaks based on the traffic distribution developed above and growth rates. Growth rates will be obtained from MORPC or calculated using historic data to develop Background (No Build) traffic for the Opening and Horizon Years. Site traffic will be added to the Background traffic to develop Build traffic.

- Capacity Analysis - Perform capacity analysis using the HCM 6th Edition module of Synchro 10 software at the below intersections for Build and No Build, AM and PM Peaks.
 - Fishing Road/Tremont Road/Northwest Boulevard
 - Trentwood Road & Northwest Boulevard
 - Tremont Road & Ridgecliff Road/Proposed Site Access
 - Northwest Boulevard & Existing, Signalized Full Access to Kingsdale Shopping Center
 - Tremont Road & Milden Road
 - Tremont Road & Zollinger Road
 - Northwest Boulevard & Zollinger RoadIf acceptable Level-of-Service (LOS) is not obtained, determine what mitigation is necessary to obtain acceptable LOS. A minimum LOS of D for the overall intersection/approaches, and LOS E for individual movements will be considered acceptable for all intersections.
- Queuing Analysis - Perform queuing analysis using the SimTraffic module of Synchro 10 software at the above listed intersections for Build and No Build, AM and PM Peaks. Mitigate queues that exceed available storage space.
- Turn Lane Warrant Analysis - Perform turn lane warrant analyses at all unsignalized intersections using standard ODOT turn lane warrant graphs. Calculate lengths for any turn lanes that are warranted.
- Report - Develop a report that documents what is necessary to satisfy Upper Arlington which typically includes analysis, results, conclusions, and recommendations.

Please signify your concurrence with this MOU by signing below. If you have any questions or comments, please contact Drew Laurent at 614-656-2421 or dlaurent@cmtran.com.

Sincerely,



Gina Balsamo, PE
Project Manager
Carpenter Marty Transportation

Upper Arlington (or their Representative)

Signature: Kyle Hagg Date: 8/19/20

Parking Required:

Senior: 52 IL:	@ 1.25/unit	65
Senior: 52 AL:	@ .75/unit	40
Apartments: 363	@ 1.5/unit	545
Comm. Center:	@ 2.5/ksf	250
Total:		900

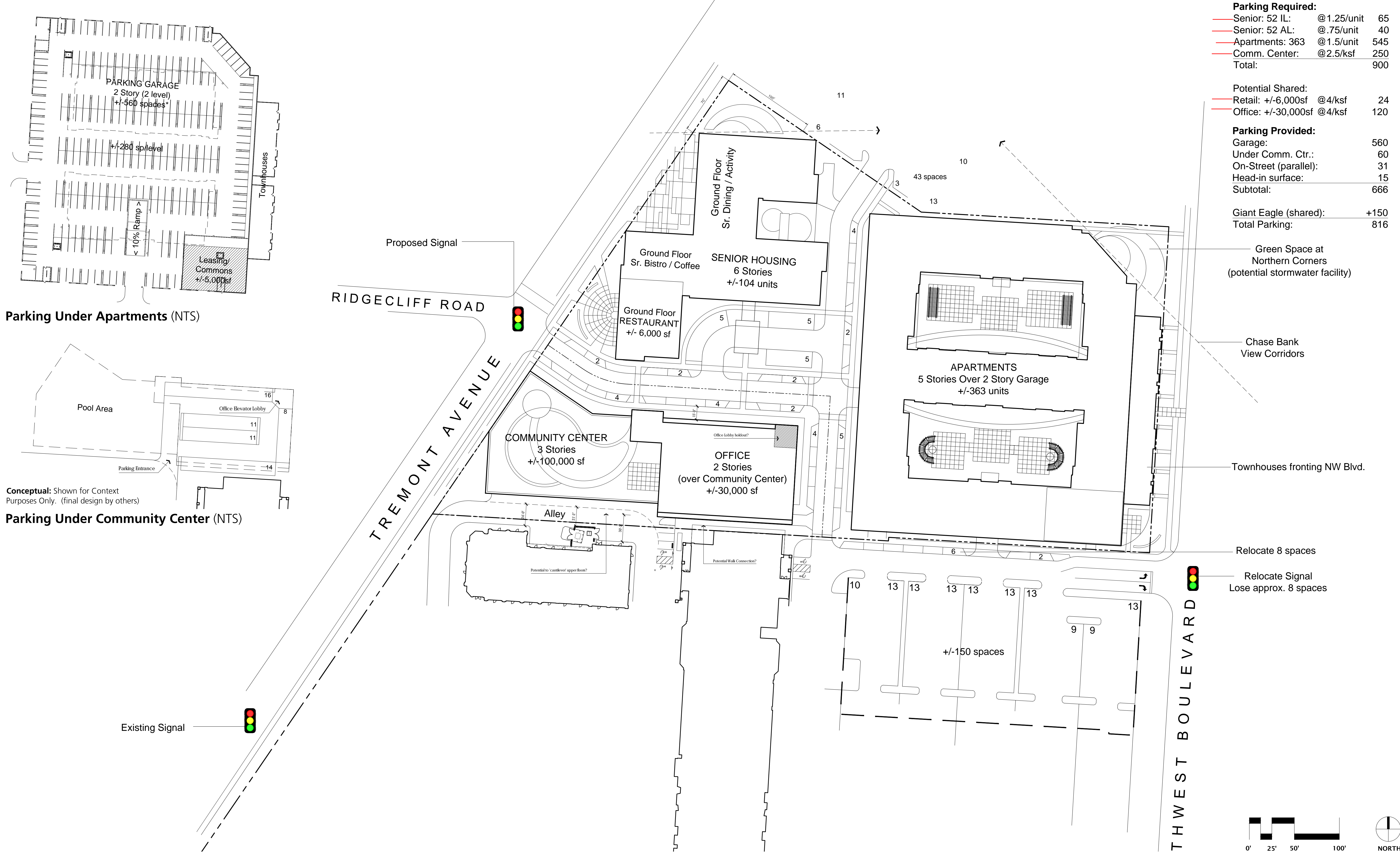
Potential Shared:

Retail: +/-6,000sf	@ 4/ksf	24
Office: +/-30,000sf	@ 4/ksf	120

Parking Provided:

Garage:	560
Under Comm. Ctr.:	60
On-Street (parallel):	31
Head-in surface:	15
Subtotal:	666

Giant Eagle (shared):	+150
Total Parking:	816



Parking Under Apartments (NTS)

Parking Under Community Center (NTS)

Conceptual: Shown for Context Purposes Only. (final design by others)



Appendix B

Count Data & Growth Rate Calculations



Turning Movement Count

Collected By:

15 Minute Counts

DATE	TIME	NBL2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR	SBR2
1/22/2020	730	0	18	20	26	8	24	43	47	20	0
1/22/2020	745	0	23	36	37	10	33	49	74	32	0
1/22/2020	800	0	29	48	47	4	5	27	47	24	0
1/22/2020	815	0	26	54	40	3	10	23	38	22	0
	Total	0	96	158	150	25	72	142	206	98	0

TIME	EBL2	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	WBR2
730	0	40	156	33	7	5	21	59	6	0
745	0	39	211	31	12	4	19	55	0	0
800	0	31	167	36	17	4	27	70	2	0
815	0	41	154	27	22	12	15	55	1	0
	Total	0	151	688	127	58	25	82	239	9

TIME	NWL2	NWL	NWT	NWR	NWR2
730	0	28	0	11	11
745	0	50	0	7	18
800	0	35	0	21	25
815	1	28	0	23	20
	Total	1	141	0	62

DATE	TIME	NBL2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR	SBR2
1/22/2020	1630	0	45	53	19	5	2	23	52	38	0
1/22/2020	1645	0	41	54	19	1	6	24	53	34	0
1/22/2020	1700	0	41	59	18	6	7	25	51	30	0
1/22/2020	1715	0	34	45	14	6	6	37	48	40	0
	Total	0	161	211	70	18	21	109	204	142	0

TIME	EBL2	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	WBR2
1630	0	34	51	38	15	20	30	141	3	0
1645	0	12	56	34	13	24	29	114	3	0
1700	0	21	62	36	17	10	37	134	2	0
1715	0	29	65	35	22	13	40	148	1	0
	Total	0	96	234	143	67	136	537	9	0

TIME	NWL2	NWL	NWT	NWR	NWR2
1630	2	66	0	26	32
1645	1	63	0	25	28
1700	1	57	0	19	31
1715	2	51	0	10	26
	Total	6	237	0	80

Northwest Boulevard and Kingsdale Shopping C... - TMC

Provided by: Carpenter Marty (CM) Transportation

Tue Aug 4, 2020

Inc.

Full Length (7 AM-9 AM, 4 PM-6 PM)

6612 Singletree Drive, Columbus, OH, 43229, US

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773741, Location: 40.021859, -83.05721

Leg Direction	Kingsdale Shopping Center Signal				Northwest Boulevard Northbound				Northwest Boulevard Southbound				Int	
	Eastbound	L	R	U	App	L	T	U	App	T	R	U		App
Time		L	R	U	App	L	T	U	App	T	R	U	App	Int
2020-08-04 7:00AM		3	0	0	3	3	11	0	14	19	10	0	29	46
7:15AM		4	0	0	4	2	12	0	14	16	6	0	22	40
7:30AM		3	2	0	5	2	26	0	28	26	2	0	28	61
7:45AM		9	0	0	9	6	23	0	29	38	9	0	47	85
Hourly Total		19	2	0	21	13	72	0	85	99	27	0	126	232
8:00AM		7	0	0	7	3	19	0	22	33	4	0	37	66
8:15AM		6	1	0	7	5	24	0	29	37	10	0	47	83
8:30AM		5	1	0	6	5	44	0	49	35	12	0	47	102
8:45AM		9	0	0	9	8	42	0	50	29	15	0	44	103
Hourly Total		27	2	0	29	21	129	0	150	134	41	0	175	354
4:00PM		25	6	0	31	13	70	0	83	62	23	0	85	199
4:15PM		33	7	0	40	16	60	0	76	58	31	0	89	205
4:30PM		38	6	0	44	14	71	0	85	34	25	0	59	188
4:45PM		30	8	0	38	22	63	0	85	53	32	0	85	208
Hourly Total		126	27	0	153	65	264	0	329	207	111	0	318	800
5:00PM		20	10	0	30	15	53	0	68	57	28	0	85	183
5:15PM		37	5	0	42	12	43	0	55	56	29	0	85	182
5:30PM		20	3	0	23	19	60	0	79	61	32	0	93	195
5:45PM		37	5	0	42	11	49	0	60	64	20	0	84	186
Hourly Total		114	23	0	137	57	205	0	262	238	109	0	347	746
Total		286	54	0	340	156	670	0	826	678	288	0	966	2132
% Approach		84.1%	15.9%	0%	-	18.9%	81.1%	0%	-	70.2%	29.8%	0%	-	-
% Total		13.4%	2.5%	0%	15.9%	7.3%	31.4%	0%	38.7%	31.8%	13.5%	0%	45.3%	-
Lights		284	54	0	338	155	661	0	816	663	287	0	950	2104
% Lights		99.3%	100%	0%	99.4%	99.4%	98.7%	0%	98.8%	97.8%	99.7%	0%	98.3%	98.7%
Articulated Trucks		0	0	0	0	0	2	0	2	0	0	0	0	2
% Articulated Trucks		0%	0%	0%	0%	0%	0.3%	0%	0.2%	0%	0%	0%	0%	0.1%
Buses and Single-Unit Trucks		2	0	0	2	1	7	0	8	15	1	0	16	26
% Buses and Single-Unit Trucks		0.7%	0%	0%	0.6%	0.6%	1.0%	0%	1.0%	2.2%	0.3%	0%	1.7%	1.2%

*L: Left, R: Right, T: Thru, U: U-Turn

Northwest Boulevard and Kingsdale Shopping C... - TMC

Tue Aug 4, 2020

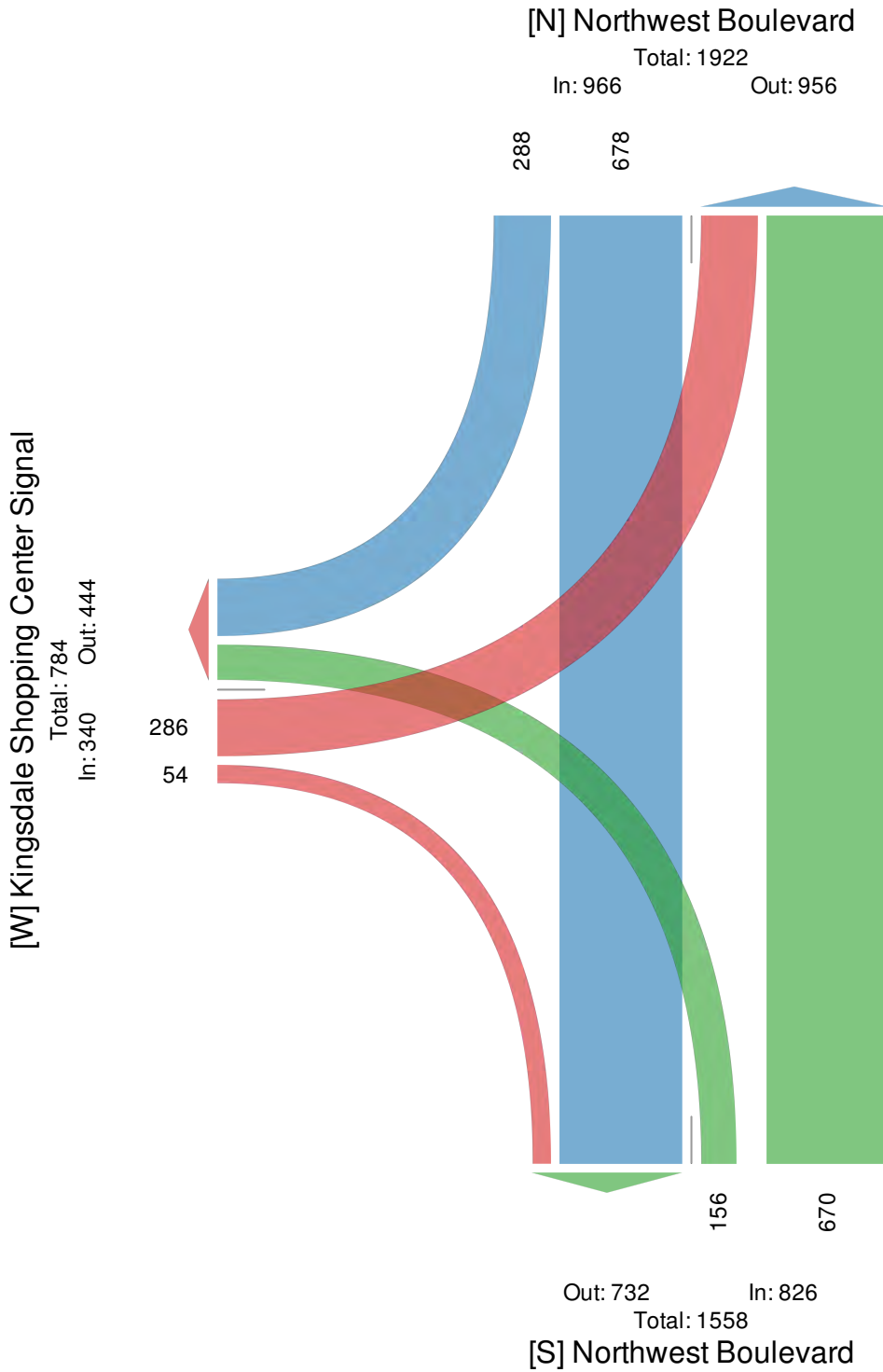
Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773741, Location: 40.021859, -83.05721

Provided by: Carpenter Marty (CM) Transportation Inc.
6612 Singletree Drive, Columbus, OH, 43229, US



Northwest Boulevard and Kingsdale Shopping C... - TMC

Provided by: Carpenter Marty (CM) Transportation

Tue Aug 4, 2020

Inc.

AM Peak (8 AM - 9 AM)

6612 Singletree Drive, Columbus, OH, 43229, US

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773741, Location: 40.021859, -83.05721

Leg Direction	Kingsdale Shopping Center Signal Eastbound				Northwest Boulevard Northbound				Northwest Boulevard Southbound				
Time	L	R	U	App	L	T	U	App	T	R	U	App	Int
2020-08-04 8:00AM	7	0	0	7	3	19	0	22	33	4	0	37	66
8:15AM	6	1	0	7	5	24	0	29	37	10	0	47	83
8:30AM	5	1	0	6	5	44	0	49	35	12	0	47	102
8:45AM	9	0	0	9	8	42	0	50	29	15	0	44	103
Total	27	2	0	29	21	129	0	150	134	41	0	175	354
% Approach	93.1%	6.9%	0%	-	14.0%	86.0%	0%	-	76.6%	23.4%	0%	-	-
% Total	7.6%	0.6%	0%	8.2%	5.9%	36.4%	0%	42.4%	37.9%	11.6%	0%	49.4%	-
PHF	0.750	0.500	-	0.806	0.656	0.733	-	0.750	0.905	0.683	-	0.931	0.859
Lights	27	2	0	29	20	126	0	146	127	41	0	168	343
% Lights	100%	100%	0%	100%	95.2%	97.7%	0%	97.3%	94.8%	100%	0%	96.0%	96.9%
Articulated Trucks	0	0	0	0	0	1	0	1	0	0	0	0	1
% Articulated Trucks	0%	0%	0%	0%	0%	0.8%	0%	0.7%	0%	0%	0%	0%	0.3%
Buses and Single-Unit Trucks	0	0	0	0	1	2	0	3	7	0	0	7	10
% Buses and Single-Unit Trucks	0%	0%	0%	0%	4.8%	1.6%	0%	2.0%	5.2%	0%	0%	4.0%	2.8%

*L: Left, R: Right, T: Thru, U: U-Turn

Northwest Boulevard and Kingsdale Shopping C... - TMC

Tue Aug 4, 2020

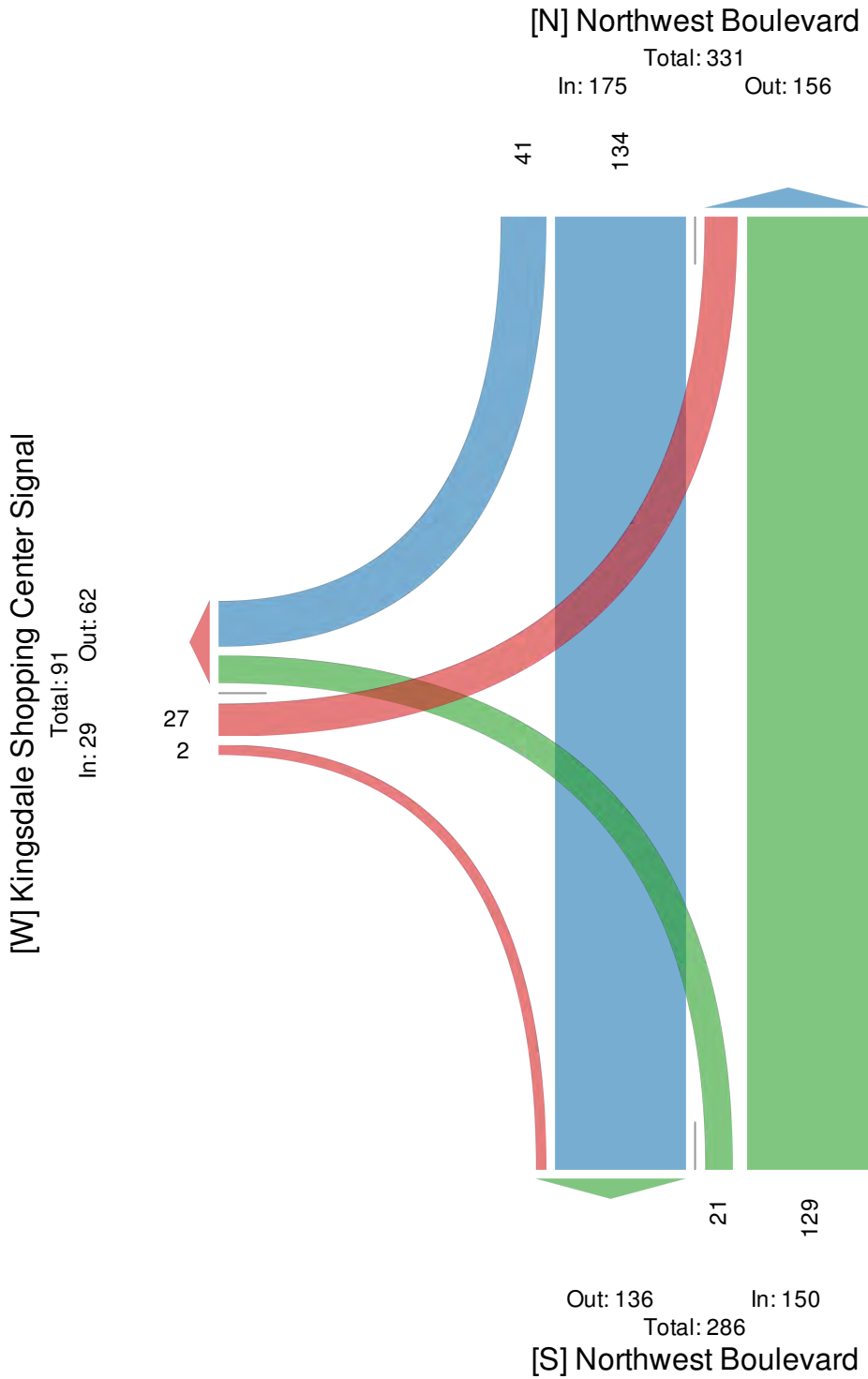
AM Peak (8 AM - 9 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773741, Location: 40.021859, -83.05721

Provided by: Carpenter Marty (CM) Transportation Inc.
6612 Singletree Drive, Columbus, OH, 43229, US



Northwest Boulevard and Kingsdale Shopping C... - TMC

Provided by: Carpenter Marty (CM) Transportation

Tue Aug 4, 2020

Inc.

PM Peak (4 PM - 5 PM) - Overall Peak Hour

6612 Singletree Drive, Columbus, OH, 43229, US

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773741, Location: 40.021859, -83.05721

Leg Direction	Kingsdale Shopping Center Signal Eastbound				Northwest Boulevard Northbound				Northwest Boulevard Southbound				
Time	L	R	U	App	L	T	U	App	T	R	U	App	Int
2020-08-04 4:00PM	25	6	0	31	13	70	0	83	62	23	0	85	199
4:15PM	33	7	0	40	16	60	0	76	58	31	0	89	205
4:30PM	38	6	0	44	14	71	0	85	34	25	0	59	188
4:45PM	30	8	0	38	22	63	0	85	53	32	0	85	208
Total	126	27	0	153	65	264	0	329	207	111	0	318	800
% Approach	82.4%	17.6%	0%	-	19.8%	80.2%	0%	-	65.1%	34.9%	0%	-	-
% Total	15.8%	3.4%	0%	19.1%	8.1%	33.0%	0%	41.1%	25.9%	13.9%	0%	39.8%	-
PHF	0.829	0.844	-	0.869	0.739	0.930	-	0.968	0.835	0.867	-	0.893	0.962
Lights	125	27	0	152	65	263	0	328	206	111	0	317	797
% Lights	99.2%	100%	0%	99.3%	100%	99.6%	0%	99.7%	99.5%	100%	0%	99.7%	99.6%
Articulated Trucks	0	0	0	0	0	1	0	1	0	0	0	0	1
% Articulated Trucks	0%	0%	0%	0%	0%	0.4%	0%	0.3%	0%	0%	0%	0%	0.1%
Buses and Single-Unit Trucks	1	0	0	1	0	0	0	0	1	0	0	1	2
% Buses and Single-Unit Trucks	0.8%	0%	0%	0.7%	0%	0%	0%	0%	0.5%	0%	0%	0.3%	0.3%

*L: Left, R: Right, T: Thru, U: U-Turn

Northwest Boulevard and Kingsdale Shopping C... - TMC

Tue Aug 4, 2020

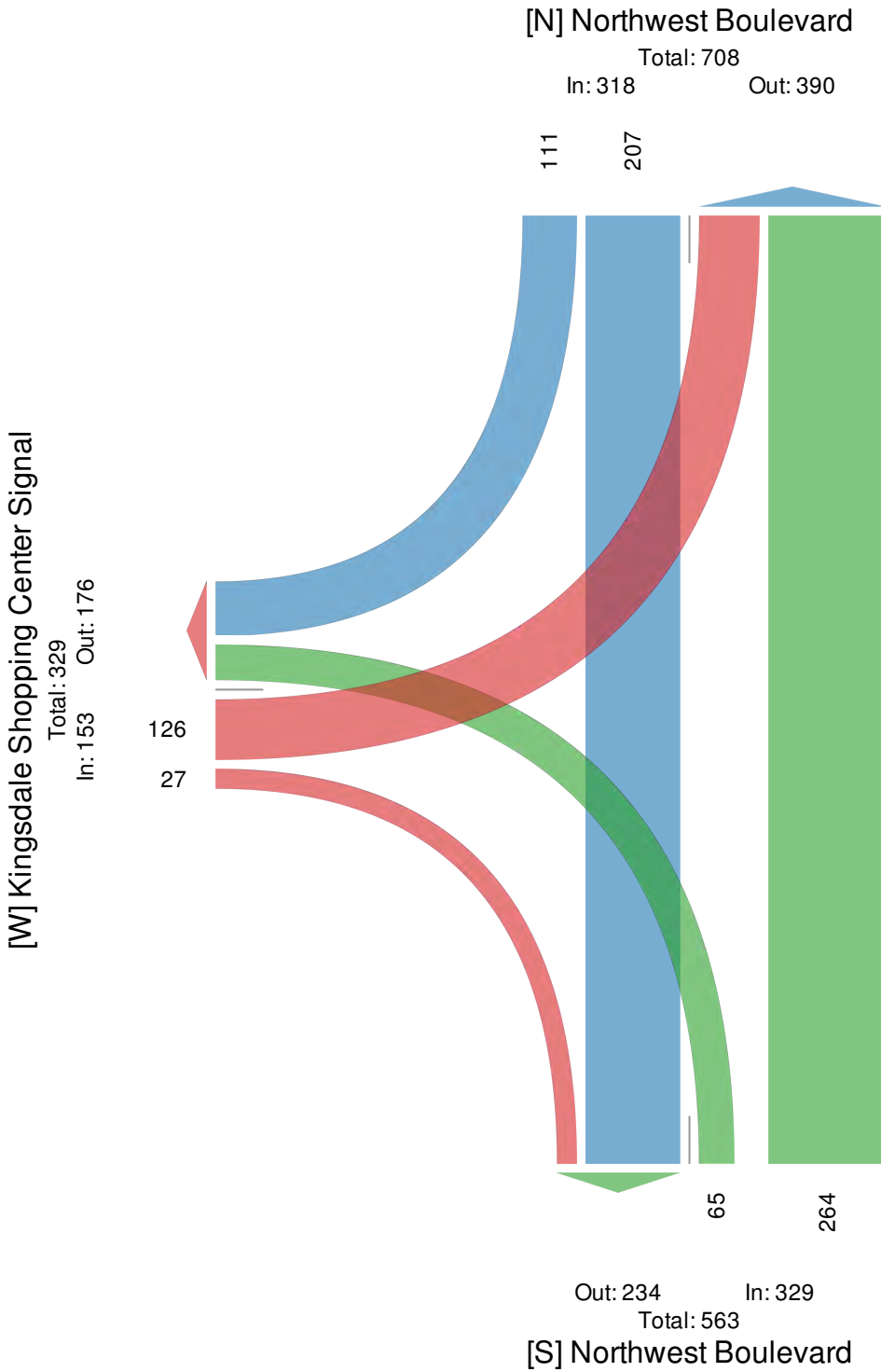
PM Peak (4 PM - 5 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773741, Location: 40.021859, -83.05721

Provided by: Carpenter Marty (CM) Transportation Inc.
6612 Singletree Drive, Columbus, OH, 43229, US



Northwest Boulevard and Trentwood Road - TMC

Provided by: Carpenter Marty (CM) Transportation

Tue Aug 4, 2020

Inc.

Full Length (7 AM-9 AM, 4 PM-6 PM)

6612 Singletree Drive, Columbus, OH, 43229, US

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773740, Location: 40.023308, -83.057098

Leg Direction	Trentwood Road Westbound				Northwest Boulevard Northbound				Northwest Boulevard Southbound				Int
	L	R	U	App	T	R	U	App	L	T	U	App	
Time													
2020-08-04 7:00AM	2	3	0	5	13	0	0	13	4	27	0	31	49
7:15AM	5	6	0	11	16	0	0	16	2	18	0	20	47
7:30AM	0	6	0	6	27	2	0	29	2	28	0	30	65
7:45AM	6	7	0	13	28	3	0	31	3	43	0	46	90
Hourly Total	13	22	0	35	84	5	0	89	11	116	0	127	251
8:00AM	3	0	0	3	25	1	0	26	1	36	0	37	66
8:15AM	6	7	0	13	30	2	0	32	2	47	0	49	94
8:30AM	6	6	0	12	46	3	0	49	4	41	0	45	106
8:45AM	11	6	0	17	49	1	0	50	4	35	0	39	106
Hourly Total	26	19	0	45	150	7	0	157	11	159	0	170	372
4:00PM	7	4	0	11	89	11	0	100	5	81	0	86	197
4:15PM	10	2	0	12	88	4	0	92	4	73	0	77	181
4:30PM	10	8	0	18	101	6	0	107	3	59	0	62	187
4:45PM	7	8	0	15	85	9	0	94	5	79	0	84	193
Hourly Total	34	22	0	56	363	30	0	393	17	292	0	309	758
5:00PM	8	5	0	13	70	9	0	79	6	82	0	88	180
5:15PM	4	4	0	8	77	2	0	79	2	78	0	80	167
5:30PM	4	2	0	6	78	6	0	84	1	85	0	86	176
5:45PM	8	4	0	12	85	3	0	88	5	78	0	83	183
Hourly Total	24	15	0	39	310	20	0	330	14	323	0	337	706
Total	97	78	0	175	907	62	0	969	53	890	0	943	2087
% Approach	55.4%	44.6%	0%	-	93.6%	6.4%	0%	-	5.6%	94.4%	0%	-	-
% Total	4.6%	3.7%	0%	8.4%	43.5%	3.0%	0%	46.4%	2.5%	42.6%	0%	45.2%	-
Lights	97	78	0	175	896	62	0	958	52	874	0	926	2059
% Lights	100%	100%	0%	100%	98.8%	100%	0%	98.9%	98.1%	98.2%	0%	98.2%	98.7%
Articulated Trucks	0	0	0	0	2	0	0	2	0	0	0	0	2
% Articulated Trucks	0%	0%	0%	0%	0.2%	0%	0%	0.2%	0%	0%	0%	0%	0.1%
Buses and Single-Unit Trucks	0	0	0	0	9	0	0	9	1	16	0	17	26
% Buses and Single-Unit Trucks	0%	0%	0%	0%	1.0%	0%	0%	0.9%	1.9%	1.8%	0%	1.8%	1.2%

*L: Left, R: Right, T: Thru, U: U-Turn

Northwest Boulevard and Trentwood Road - TMC

Tue Aug 4, 2020

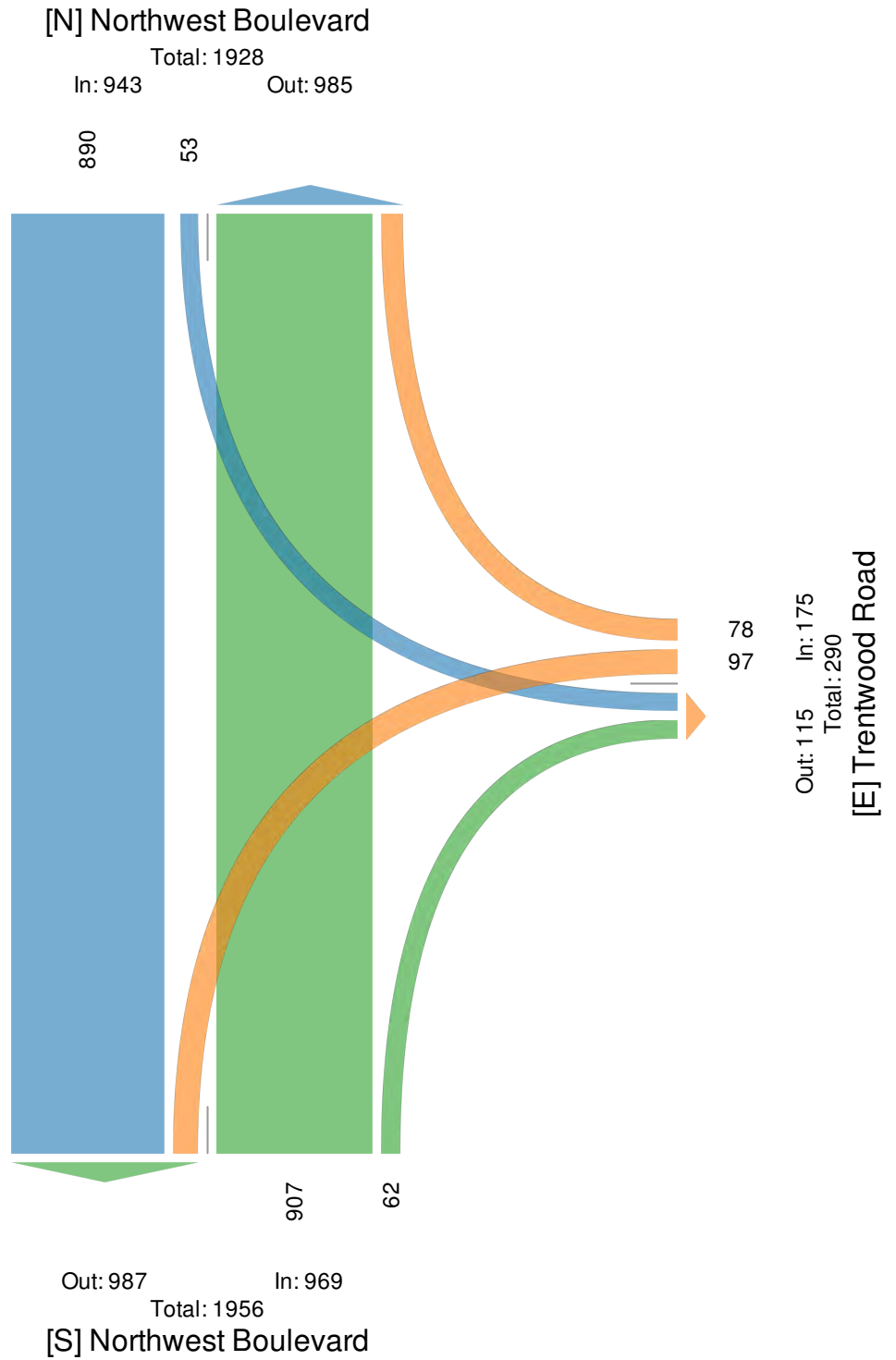
Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773740, Location: 40.023308, -83.057098

Provided by: Carpenter Marty (CM) Transportation Inc.
6612 Singletree Drive, Columbus, OH, 43229, US



Northwest Boulevard and Trentwood Road - TMC

Provided by: Carpenter Marty (CM) Transportation

Tue Aug 4, 2020

Inc.

AM Peak (8 AM - 9 AM)

6612 Singletree Drive, Columbus, OH, 43229, US

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773740, Location: 40.023308, -83.057098

Leg Direction	Trentwood Road Westbound				Northwest Boulevard Northbound				Northwest Boulevard Southbound				Int
	L	R	U	App	T	R	U	App	L	T	U	App	
Time													
2020-08-04 8:00AM	3	0	0	3	25	1	0	26	1	36	0	37	66
8:15AM	6	7	0	13	30	2	0	32	2	47	0	49	94
8:30AM	6	6	0	12	46	3	0	49	4	41	0	45	106
8:45AM	11	6	0	17	49	1	0	50	4	35	0	39	106
Total	26	19	0	45	150	7	0	157	11	159	0	170	372
% Approach	57.8%	42.2%	0%	-	95.5%	4.5%	0%	-	6.5%	93.5%	0%	-	-
% Total	7.0%	5.1%	0%	12.1%	40.3%	1.9%	0%	42.2%	3.0%	42.7%	0%	45.7%	-
PHF	0.591	0.679	-	0.662	0.765	0.583	-	0.785	0.688	0.846	-	0.867	0.877
Lights	26	19	0	45	147	7	0	154	11	152	0	163	362
% Lights	100%	100%	0%	100%	98.0%	100%	0%	98.1%	100%	95.6%	0%	95.9%	97.3%
Articulated Trucks	0	0	0	0	1	0	0	1	0	0	0	0	1
% Articulated Trucks	0%	0%	0%	0%	0.7%	0%	0%	0.6%	0%	0%	0%	0%	0.3%
Buses and Single-Unit Trucks	0	0	0	0	2	0	0	2	0	7	0	7	9
% Buses and Single-Unit Trucks	0%	0%	0%	0%	1.3%	0%	0%	1.3%	0%	4.4%	0%	4.1%	2.4%

*L: Left, R: Right, T: Thru, U: U-Turn

Northwest Boulevard and Trentwood Road - TMC

Tue Aug 4, 2020

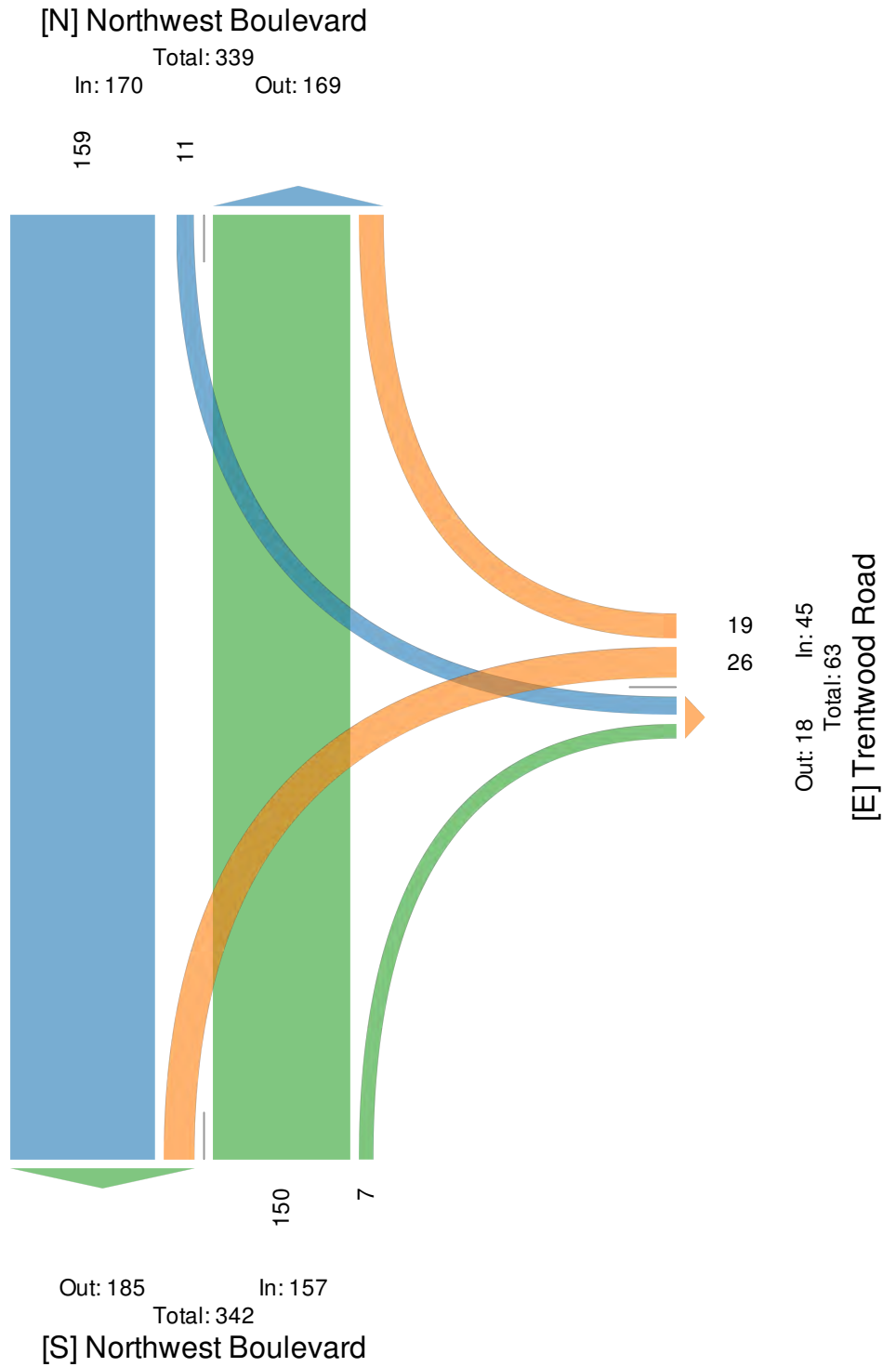
AM Peak (8 AM - 9 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773740, Location: 40.023308, -83.057098

Provided by: Carpenter Marty (CM) Transportation Inc.
6612 Singletree Drive, Columbus, OH, 43229, US



Northwest Boulevard and Trentwood Road - TMC

Provided by: Carpenter Marty (CM) Transportation

Tue Aug 4, 2020

Inc.

PM Peak (4 PM - 5 PM) - Overall Peak Hour

6612 Singletree Drive, Columbus, OH, 43229, US

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773740, Location: 40.023308, -83.057098

Leg Direction	Trentwood Road Westbound				Northwest Boulevard Northbound				Northwest Boulevard Southbound				Int
	L	R	U	App	T	R	U	App	L	T	U	App	
2020-08-04 4:00PM	7	4	0	11	89	11	0	100	5	81	0	86	197
4:15PM	10	2	0	12	88	4	0	92	4	73	0	77	181
4:30PM	10	8	0	18	101	6	0	107	3	59	0	62	187
4:45PM	7	8	0	15	85	9	0	94	5	79	0	84	193
Total	34	22	0	56	363	30	0	393	17	292	0	309	758
% Approach	60.7%	39.3%	0%	-	92.4%	7.6%	0%	-	5.5%	94.5%	0%	-	-
% Total	4.5%	2.9%	0%	7.4%	47.9%	4.0%	0%	51.8%	2.2%	38.5%	0%	40.8%	-
PHF	0.850	0.688	-	0.778	0.899	0.682	-	0.918	0.850	0.901	-	0.898	0.962
Lights	34	22	0	56	361	30	0	391	17	291	0	308	755
% Lights	100%	100%	0%	100%	99.4%	100%	0%	99.5%	100%	99.7%	0%	99.7%	99.6%
Articulated Trucks	0	0	0	0	1	0	0	1	0	0	0	0	1
% Articulated Trucks	0%	0%	0%	0%	0.3%	0%	0%	0.3%	0%	0%	0%	0%	0.1%
Buses and Single-Unit Trucks	0	0	0	0	1	0	0	1	0	1	0	1	2
% Buses and Single-Unit Trucks	0%	0%	0%	0%	0.3%	0%	0%	0.3%	0%	0.3%	0%	0.3%	0.3%

*L: Left, R: Right, T: Thru, U: U-Turn

Northwest Boulevard and Trentwood Road - TMC

Tue Aug 4, 2020

PM Peak (4 PM - 5 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773740, Location: 40.023308, -83.057098

Provided by: Carpenter Marty (CM) Transportation Inc.
6612 Singletree Drive, Columbus, OH, 43229, US

[N] Northwest Boulevard

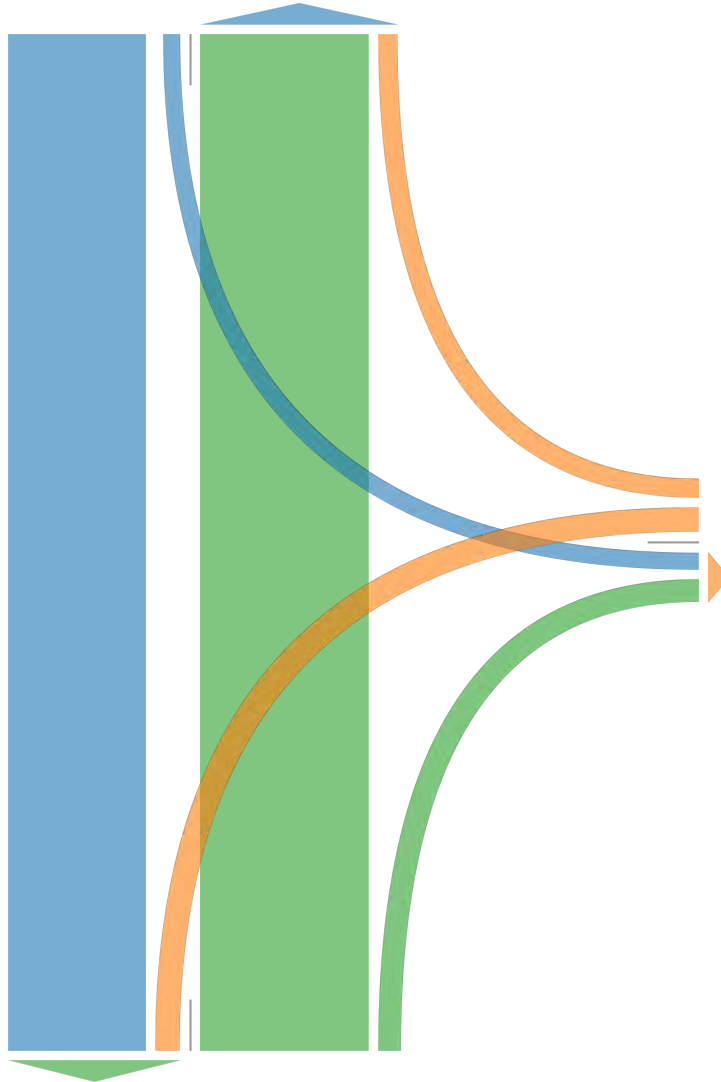
Total: 694

In: 309

Out: 385

292

17



22
34

Out: 47 In: 56
Total: 103

[E] Trentwood Road

Out: 326

In: 393

Total: 719

[S] Northwest Boulevard

Northwest Boulevard and Zollinger Road - TMC

Provided by: Carpenter Marty (CM) Transportation

Tue Aug 18, 2020

Inc.

Full Length (7 AM-9 AM, 4 PM-6 PM)

6612 Singletree Drive, Columbus, OH, 43229, US

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775337, Location: 40.018759, -83.057396

Leg Direction	Zollinger Road Eastbound					Zollinger Road Westbound					Northwest Boulevard Northbound					Northwest Boulevard Southbound					Int
	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	
2020-08-18																					
7:00AM	4	9	5	0	18	1	9	3	0	13	7	14	4	0	25	2	16	1	0	19	75
7:15AM	1	17	5	0	23	1	18	3	0	22	12	19	2	0	33	3	19	2	0	24	102
7:30AM	2	20	9	0	31	1	16	2	0	19	18	22	5	0	45	3	21	2	0	26	121
7:45AM	2	20	8	0	30	6	17	3	0	26	16	33	3	0	52	4	29	5	0	38	146
Hourly Total	9	66	27	0	102	9	60	11	0	80	53	88	14	0	155	12	85	10	0	107	444
8:00AM	5	25	7	0	37	4	12	6	0	22	8	18	2	0	28	5	18	6	0	29	116
8:15AM	6	12	15	0	33	5	10	1	0	16	23	39	9	0	71	4	28	6	0	38	158
8:30AM	3	12	16	0	31	5	14	3	0	22	13	32	4	0	49	1	34	6	0	41	143
8:45AM	8	25	15	0	48	3	18	3	0	24	15	36	9	0	60	4	30	5	0	39	171
Hourly Total	22	74	53	0	149	17	54	13	0	84	59	125	24	0	208	14	110	23	0	147	588
4:00PM	13	24	21	0	58	2	19	4	0	25	17	50	5	0	72	10	45	13	0	68	223
4:15PM	11	29	16	0	56	1	17	7	0	25	10	48	5	0	63	20	57	11	0	88	232
4:30PM	11	38	23	0	72	1	23	15	0	39	23	62	10	0	95	4	52	5	0	61	267
4:45PM	11	33	15	0	59	4	36	14	0	54	17	51	13	0	81	10	48	19	0	77	271
Hourly Total	46	124	75	0	245	8	95	40	0	143	67	211	33	0	311	44	202	48	0	294	993
5:00PM	15	36	21	0	72	4	30	12	0	46	21	61	14	0	96	16	46	11	0	73	287
5:15PM	11	32	21	0	64	5	21	17	0	43	12	50	8	0	70	19	65	19	0	103	280
5:30PM	9	12	9	0	30	4	16	7	0	27	22	61	6	0	89	16	69	18	0	103	249
5:45PM	12	24	12	0	48	4	15	10	0	29	22	44	6	0	72	8	62	25	0	95	244
Hourly Total	47	104	63	0	214	17	82	46	0	145	77	216	34	0	327	59	242	73	0	374	1060
Total	124	368	218	0	710	51	291	110	0	452	256	640	105	0	1001	129	639	154	0	922	3085
% Approach	17.5%	51.8%	30.7%	0%	-	11.3%	64.4%	24.3%	0%	-	25.6%	63.9%	10.5%	0%	-	14.0%	69.3%	16.7%	0%	-	-
% Total	4.0%	11.9%	7.1%	0%	23.0%	1.7%	9.4%	3.6%	0%	14.7%	8.3%	20.7%	3.4%	0%	32.4%	4.2%	20.7%	5.0%	0%	29.9%	-
Lights	121	363	215	0	699	49	289	109	0	447	243	633	104	0	980	129	619	153	0	901	3027
% Lights	97.6%	98.6%	98.6%	0%	98.5%	96.1%	99.3%	99.1%	0%	98.9%	94.9%	98.9%	99.0%	0%	97.9%	100%	96.9%	99.4%	0%	97.7%	98.1%
Articulated Trucks	1	1	0	0	2	0	2	1	0	3	1	1	0	0	2	0	1	0	0	1	8
% Articulated Trucks	0.8%	0.3%	0%	0%	0.3%	0%	0.7%	0.9%	0%	0.7%	0.4%	0.2%	0%	0%	0.2%	0%	0.2%	0%	0%	0.1%	0.3%
Buses and Single-Unit Trucks	2	4	3	0	9	2	0	0	0	2	12	6	1	0	19	0	19	1	0	20	50
% Buses and Single-Unit Trucks	1.6%	1.1%	1.4%	0%	1.3%	3.9%	0%	0%	0%	0.4%	4.7%	0.9%	1.0%	0%	1.9%	0%	3.0%	0.6%	0%	2.2%	1.6%

* L: Left, R: Right, T: Thru, U: U-Turn

Northwest Boulevard and Zollinger Road - TMC

Tue Aug 18, 2020

Full Length (7 AM-9 AM, 4 PM-6 PM)

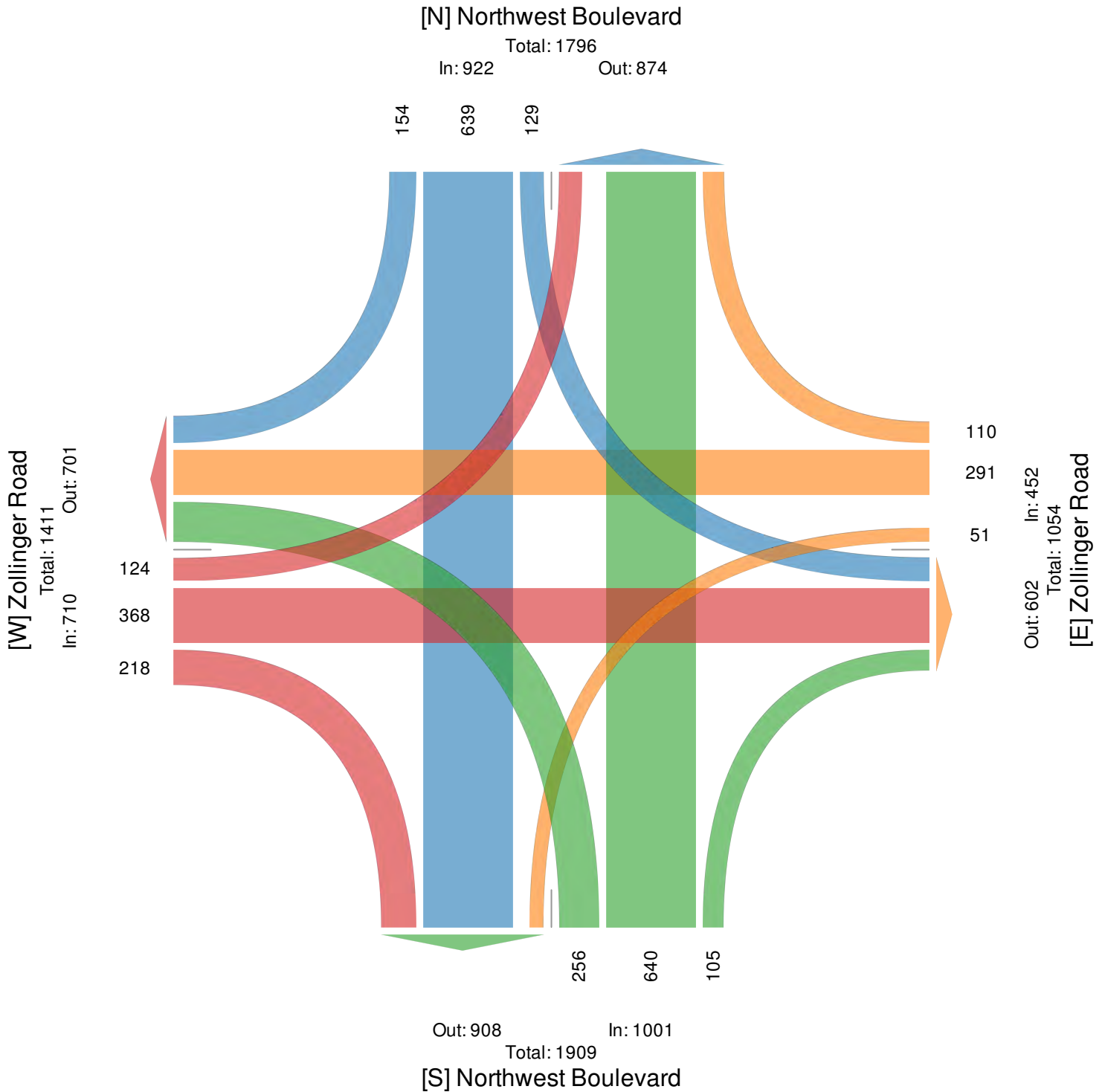
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775337, Location: 40.018759, -83.057396

Provided by: Carpenter Marty (CM) Transportation Inc.

6612 Singletree Drive, Columbus, OH, 43229, US



Northwest Boulevard and Zollinger Road - TMC

Provided by: Carpenter Marty (CM) Transportation

Tue Aug 18, 2020

Inc.

AM Peak (8 AM - 9 AM)

6612 Singletree Drive, Columbus, OH, 43229, US

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775337, Location: 40.018759, -83.057396

Leg Direction	Zollinger Road Eastbound					Zollinger Road Westbound					Northwest Boulevard Northbound					Northwest Boulevard Southbound					Int
	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	
2020-08-18																					
8:00AM	5	25	7	0	37	4	12	6	0	22	8	18	2	0	28	5	18	6	0	29	116
8:15AM	6	12	15	0	33	5	10	1	0	16	23	39	9	0	71	4	28	6	0	38	158
8:30AM	3	12	16	0	31	5	14	3	0	22	13	32	4	0	49	1	34	6	0	41	143
8:45AM	8	25	15	0	48	3	18	3	0	24	15	36	9	0	60	4	30	5	0	39	171
Total	22	74	53	0	149	17	54	13	0	84	59	125	24	0	208	14	110	23	0	147	588
% Approach	14.8%	49.7%	35.6%	0%	-	20.2%	64.3%	15.5%	0%	-	28.4%	60.1%	11.5%	0%	-	9.5%	74.8%	15.6%	0%	-	-
% Total	3.7%	12.6%	9.0%	0%	25.3%	2.9%	9.2%	2.2%	0%	14.3%	10.0%	21.3%	4.1%	0%	35.4%	2.4%	18.7%	3.9%	0%	25.0%	-
PHF	0.688	0.740	0.828	-	0.776	0.850	0.750	0.542	-	0.875	0.641	0.801	0.667	-	0.732	0.700	0.809	0.958	-	0.896	0.860
Lights	21	71	53	0	145	16	52	13	0	81	54	122	24	0	200	14	103	22	0	139	565
% Lights	95.5%	95.9%	100%	0%	97.3%	94.1%	96.3%	100%	0%	96.4%	91.5%	97.6%	100%	0%	96.2%	100%	93.6%	95.7%	0%	94.6%	96.1%
Articulate d Trucks	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	0	0	0	0	0	3
% Articulate d Trucks	0%	0%	0%	0%	0%	0%	3.7%	0%	0%	2.4%	1.7%	0%	0%	0%	0.5%	0%	0%	0%	0%	0%	0.5%
Buses and Single-Unit Trucks	1	3	0	0	4	1	0	0	0	1	4	3	0	0	7	0	7	1	0	8	20
% Buses and Single-Unit Trucks	4.5%	4.1%	0%	0%	2.7%	5.9%	0%	0%	0%	1.2%	6.8%	2.4%	0%	0%	3.4%	0%	6.4%	4.3%	0%	5.4%	3.4%

* L: Left, R: Right, T: Thru, U: U-Turn

Northwest Boulevard and Zollinger Road - TMC

Tue Aug 18, 2020

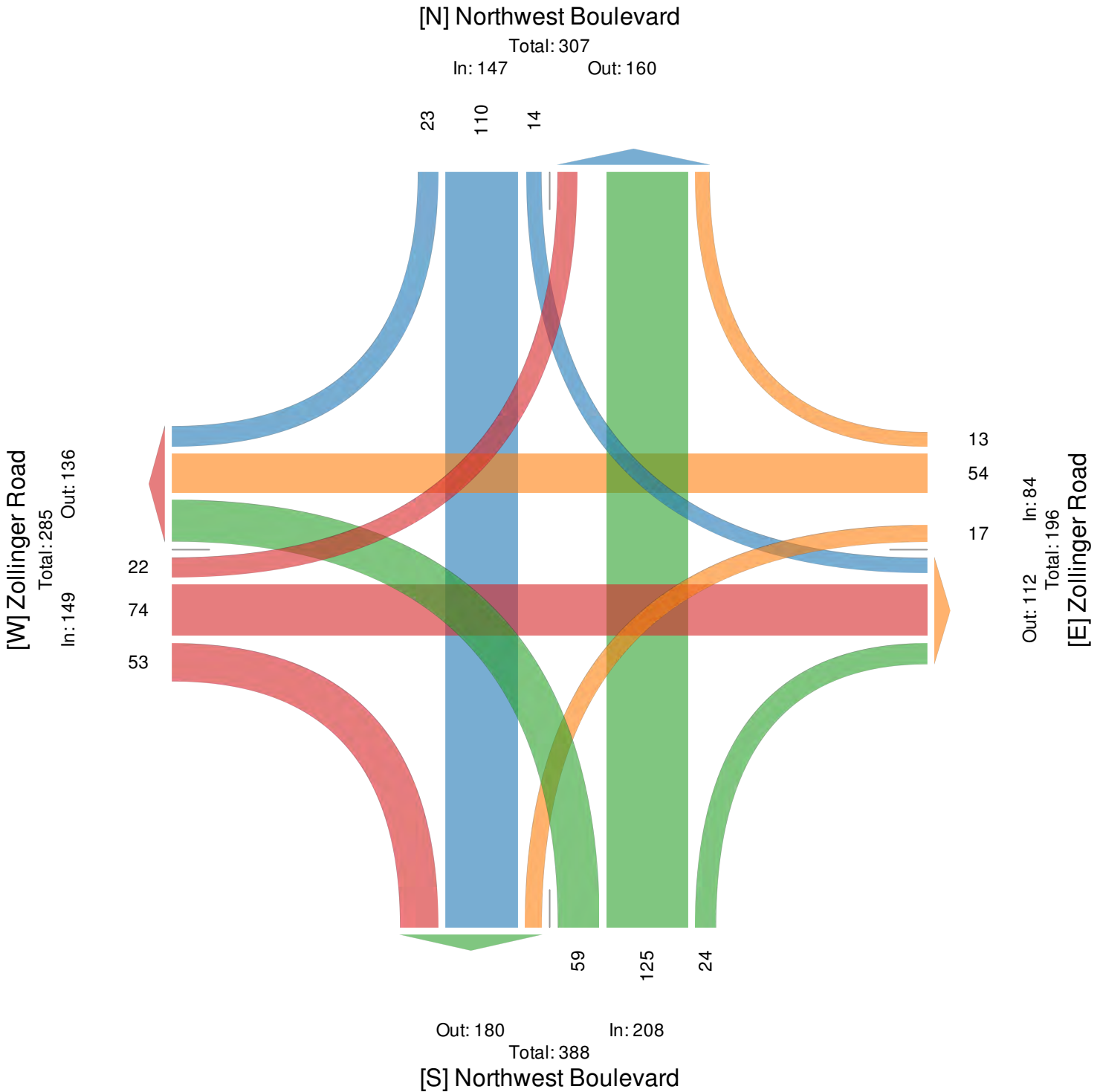
AM Peak (8 AM - 9 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775337, Location: 40.018759, -83.057396

Provided by: Carpenter Marty (CM) Transportation Inc.
6612 Singletree Drive, Columbus, OH, 43229, US



Northwest Boulevard and Zollinger Road - TMC

Provided by: Carpenter Marty (CM) Transportation

Tue Aug 18, 2020

Inc.

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

6612 Singletree Drive, Columbus, OH, 43229, US

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775337, Location: 40.018759, -83.057396

Leg Direction	Zollinger Road Eastbound					Zollinger Road Westbound					Northwest Boulevard Northbound					Northwest Boulevard Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2020-08-18																					
4:30PM	11	38	23	0	72	1	23	15	0	39	23	62	10	0	95	4	52	5	0	61	267
4:45PM	11	33	15	0	59	4	36	14	0	54	17	51	13	0	81	10	48	19	0	77	271
5:00PM	15	36	21	0	72	4	30	12	0	46	21	61	14	0	96	16	46	11	0	73	287
5:15PM	11	32	21	0	64	5	21	17	0	43	12	50	8	0	70	19	65	19	0	103	280
Total	48	139	80	0	267	14	110	58	0	182	73	224	45	0	342	49	211	54	0	314	1105
% Approach	18.0%	52.1%	30.0%	0%	-	7.7%	60.4%	31.9%	0%	-	21.3%	65.5%	13.2%	0%	-	15.6%	67.2%	17.2%	0%	-	-
% Total	4.3%	12.6%	7.2%	0%	24.2%	1.3%	10.0%	5.2%	0%	16.5%	6.6%	20.3%	4.1%	0%	31.0%	4.4%	19.1%	4.9%	0%	28.4%	-
PHF	0.800	0.914	0.870	-	0.927	0.700	0.764	0.853	-	0.843	0.793	0.903	0.804	-	0.891	0.645	0.812	0.711	-	0.762	0.963
Lights	48	137	78	0	263	14	110	58	0	182	69	224	45	0	338	49	209	54	0	312	1095
% Lights	100%	98.6%	97.5%	0%	98.5%	100%	100%	100%	0%	100%	94.5%	100%	100%	0%	98.8%	100%	99.1%	100%	0%	99.4%	99.1%
Articulate d Trucks	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Articulate d Trucks	0%	0.7%	0%	0%	0.4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.1%
Buses and Single-Unit Trucks	0	1	2	0	3	0	0	0	0	0	4	0	0	0	4	0	2	0	0	2	9
% Buses and Single-Unit Trucks	0%	0.7%	2.5%	0%	1.1%	0%	0%	0%	0%	0%	5.5%	0%	0%	0%	1.2%	0%	0.9%	0%	0%	0.6%	0.8%

* L: Left, R: Right, T: Thru, U: U-Turn

Northwest Boulevard and Zollinger Road - TMC

Tue Aug 18, 2020

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

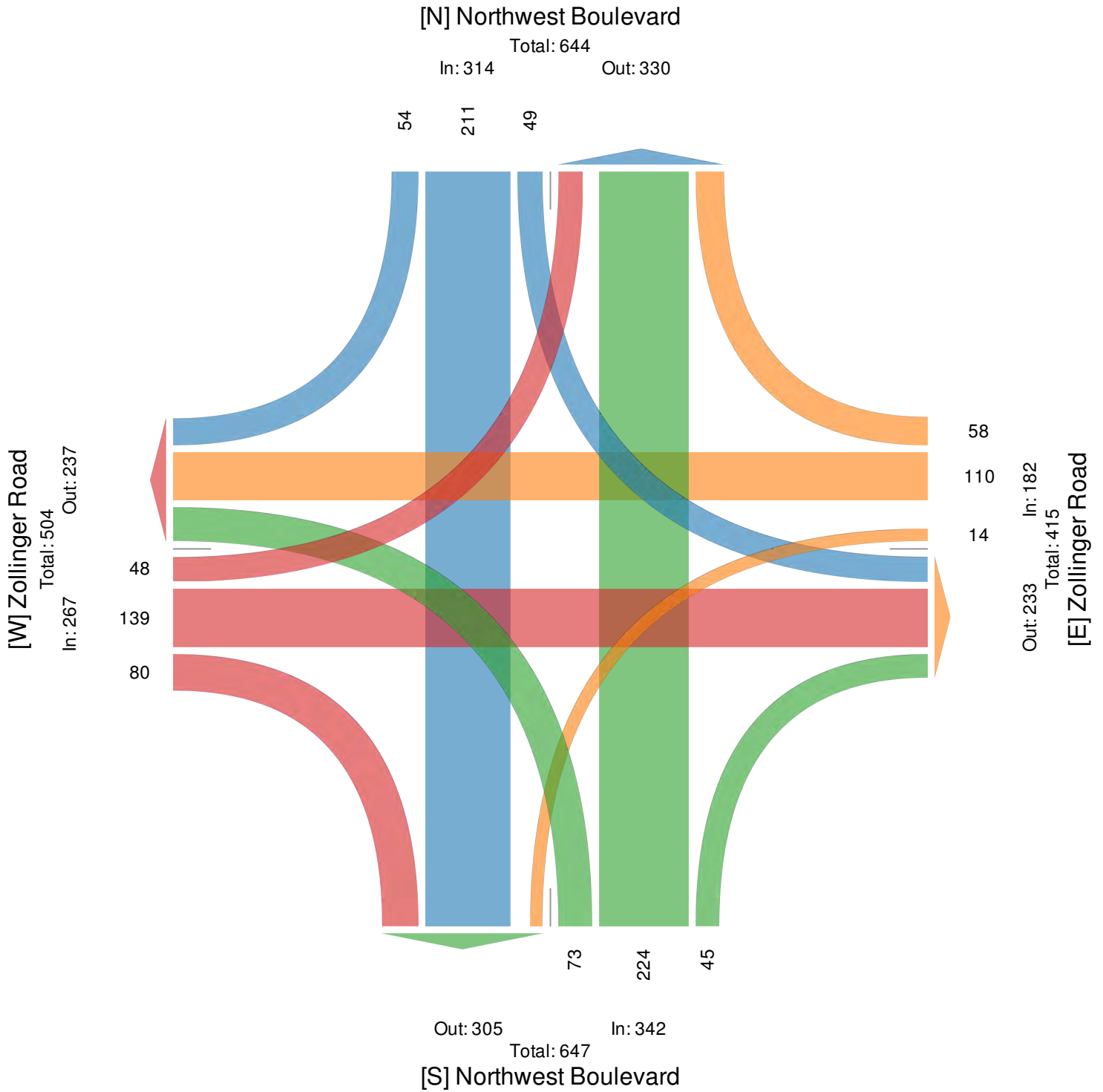
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775337, Location: 40.018759, -83.057396

Provided by: Carpenter Marty (CM) Transportation Inc.

6612 Singletree Drive, Columbus, OH, 43229, US



Tremont Road and Milden Road - TMC

Tue Aug 18, 2020

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775338, Location: 40.021222, -83.060943

Provided by: Carpenter Marty (CM) Transportation

Inc.

6612 Singletree Drive, Columbus, OH, 43229, US

Leg Direction	Milden Road Eastbound					Milden Road Westbound					Tremont Road Northbound					Tremont Road Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2020-08-18																					
7:00AM	2	0	0	0	2	1	0	0	0	1	0	30	1	0	31	8	31	0	0	39	73
7:15AM	3	0	0	0	3	1	1	1	0	3	0	30	3	0	33	9	35	0	0	44	83
7:30AM	1	1	2	0	4	0	0	5	0	5	1	36	6	0	43	11	36	0	0	47	99
7:45AM	5	1	0	0	6	2	2	0	0	4	0	54	3	0	57	10	57	0	0	67	134
Hourly Total	11	2	2	0	15	4	3	6	0	13	1	150	13	0	164	38	159	0	0	197	389
8:00AM	5	1	1	0	7	0	1	3	0	4	2	44	4	0	50	11	42	1	0	54	115
8:15AM	2	0	1	0	3	5	1	7	0	13	2	59	5	0	66	8	47	2	0	57	139
8:30AM	2	2	2	0	6	4	1	1	0	6	2	62	7	0	71	10	49	0	0	59	142
8:45AM	1	1	1	0	3	6	3	8	0	17	0	58	8	0	66	13	46	2	0	61	147
Hourly Total	10	4	5	0	19	15	6	19	0	40	6	223	24	0	253	42	184	5	0	231	543
4:00PM	2	6	1	0	9	13	8	18	0	39	5	82	15	0	102	16	64	2	0	82	232
4:15PM	2	5	1	0	8	7	5	14	0	26	1	66	12	0	79	11	55	4	0	70	183
4:30PM	6	3	3	0	12	9	3	19	0	31	4	64	19	0	87	13	76	6	0	95	225
4:45PM	6	2	0	0	8	13	4	22	0	39	4	58	15	0	77	15	75	4	0	94	218
Hourly Total	16	16	5	0	37	42	20	73	0	135	14	270	61	0	345	55	270	16	0	341	858
5:00PM	7	3	2	0	12	9	5	18	0	32	2	81	16	0	99	12	74	0	0	86	229
5:15PM	4	6	2	0	12	17	3	12	0	32	4	62	24	0	90	29	79	2	0	110	244
5:30PM	7	2	1	0	10	13	8	20	0	41	1	66	19	0	86	22	75	6	0	103	240
5:45PM	2	4	1	0	7	13	6	22	0	41	5	56	18	0	79	25	53	4	0	82	209
Hourly Total	20	15	6	0	41	52	22	72	0	146	12	265	77	0	354	88	281	12	0	381	922
Total	57	37	18	0	112	113	51	170	0	334	33	908	175	0	1116	223	894	33	0	1150	2712
% Approach	50.9%	33.0%	16.1%	0%	-	33.8%	15.3%	50.9%	0%	-	3.0%	81.4%	15.7%	0%	-	19.4%	77.7%	2.9%	0%	-	-
% Total	2.1%	1.4%	0.7%	0%	4.1%	4.2%	1.9%	6.3%	0%	12.3%	1.2%	33.5%	6.5%	0%	41.2%	8.2%	33.0%	1.2%	0%	42.4%	-
Lights	57	36	18	0	111	113	51	167	0	331	33	890	174	0	1097	222	888	33	0	1143	2682
% Lights	100%	97.3%	100%	0%	99.1%	100%	100%	98.2%	0%	99.1%	100%	98.0%	99.4%	0%	98.3%	99.6%	99.3%	100%	0%	99.4%	98.9%
Articulated Trucks	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	2
% Articulated Trucks	0%	0%	0%	0%	0%	0%	0%	0.6%	0%	0.3%	0%	0.1%	0%	0%	0.1%	0%	0%	0%	0%	0%	0.1%
Buses and Single-Unit Trucks	0	1	0	0	1	0	0	2	0	2	0	17	1	0	18	1	6	0	0	7	28
% Buses and Single-Unit Trucks	0%	2.7%	0%	0%	0.9%	0%	0%	1.2%	0%	0.6%	0%	1.9%	0.6%	0%	1.6%	0.4%	0.7%	0%	0%	0.6%	1.0%

*L: Left, R: Right, T: Thru, U: U-Turn

Tremont Road and Milden Road - TMC

Tue Aug 18, 2020

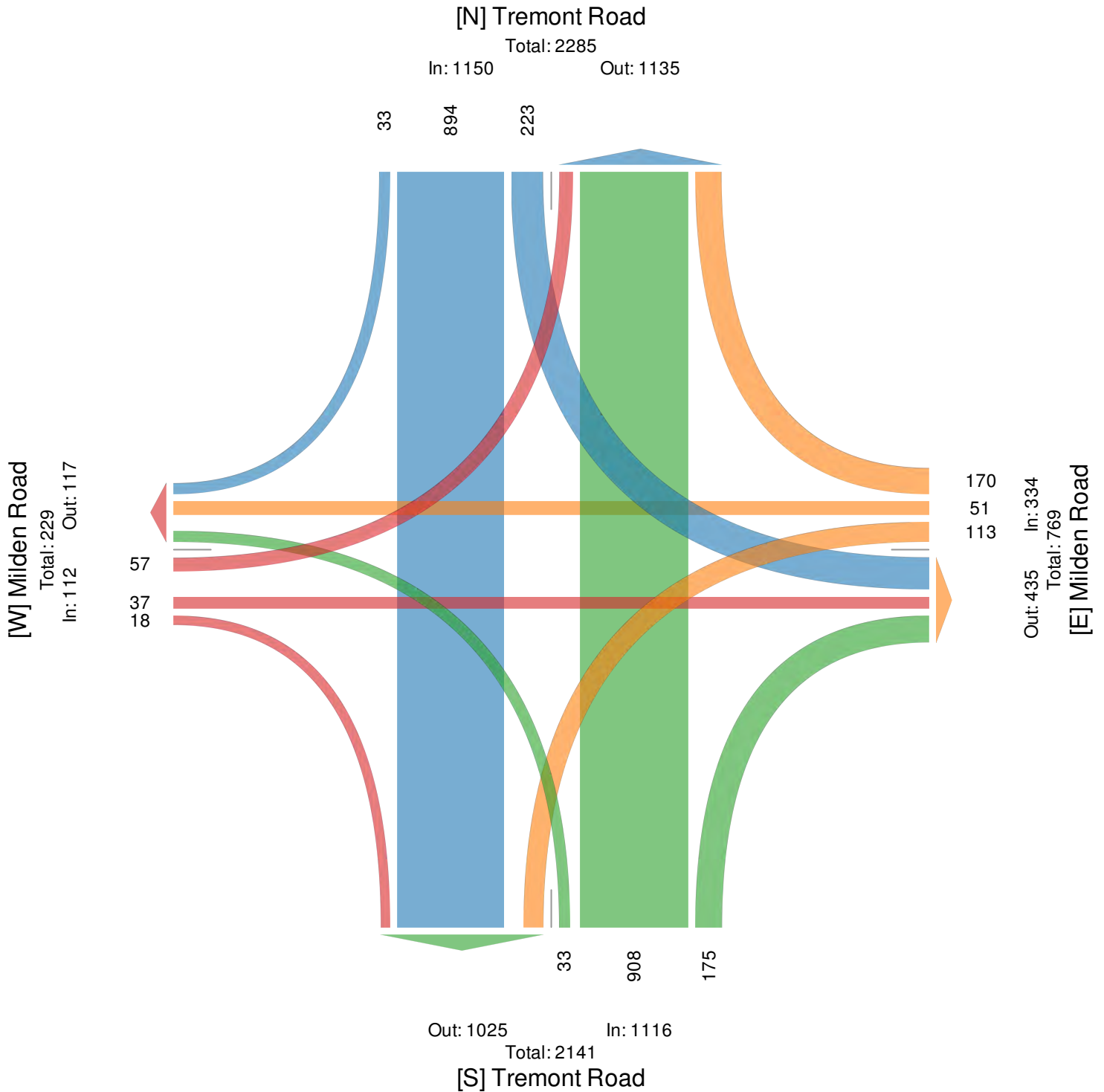
Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775338, Location: 40.021222, -83.060943

Provided by: Carpenter Marty (CM) Transportation Inc.
6612 Singletree Drive, Columbus, OH, 43229, US



Tremont Road and Milden Road - TMC

Tue Aug 18, 2020

AM Peak (8 AM - 9 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775338, Location: 40.021222, -83.060943

Provided by: Carpenter Marty (CM) Transportation

Inc.

6612 Singletree Drive, Columbus, OH, 43229, US

Leg Direction	Milden Road Eastbound					Milden Road Westbound					Tremont Road Northbound					Tremont Road Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2020-08-18																					
8:00AM	5	1	1	0	7	0	1	3	0	4	2	44	4	0	50	11	42	1	0	54	115
8:15AM	2	0	1	0	3	5	1	7	0	13	2	59	5	0	66	8	47	2	0	57	139
8:30AM	2	2	2	0	6	4	1	1	0	6	2	62	7	0	71	10	49	0	0	59	142
8:45AM	1	1	1	0	3	6	3	8	0	17	0	58	8	0	66	13	46	2	0	61	147
Total	10	4	5	0	19	15	6	19	0	40	6	223	24	0	253	42	184	5	0	231	543
% Approach	52.6%	21.1%	26.3%	0%	-	37.5%	15.0%	47.5%	0%	-	2.4%	88.1%	9.5%	0%	-	18.2%	79.7%	2.2%	0%	-	-
% Total	1.8%	0.7%	0.9%	0%	3.5%	2.8%	1.1%	3.5%	0%	7.4%	1.1%	41.1%	4.4%	0%	46.6%	7.7%	33.9%	0.9%	0%	42.5%	-
PHF	0.500	0.500	0.625	-	0.679	0.625	0.500	0.594	-	0.588	0.750	0.899	0.750	-	0.891	0.808	0.939	0.625	-	0.947	0.923
Lights	10	4	5	0	19	15	6	18	0	39	6	217	24	0	247	41	184	5	0	230	535
% Lights	100%	100%	100%	0%	100%	100%	100%	94.7%	0%	97.5%	100%	97.3%	100%	0%	97.6%	97.6%	100%	100%	0%	99.6%	98.5%
Articulate d Trucks	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
% Articulate d Trucks	0%	0%	0%	0%	0%	0%	0%	5.3%	0%	2.5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.2%
Buses and Single-Unit Trucks	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	1	0	0	0	1	7
% Buses and Single-Unit Trucks	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2.7%	0%	0%	2.4%	2.4%	0%	0%	0%	0.4%	1.3%

*L: Left, R: Right, T: Thru, U: U-Turn

Tremont Road and Milden Road - TMC

Tue Aug 18, 2020

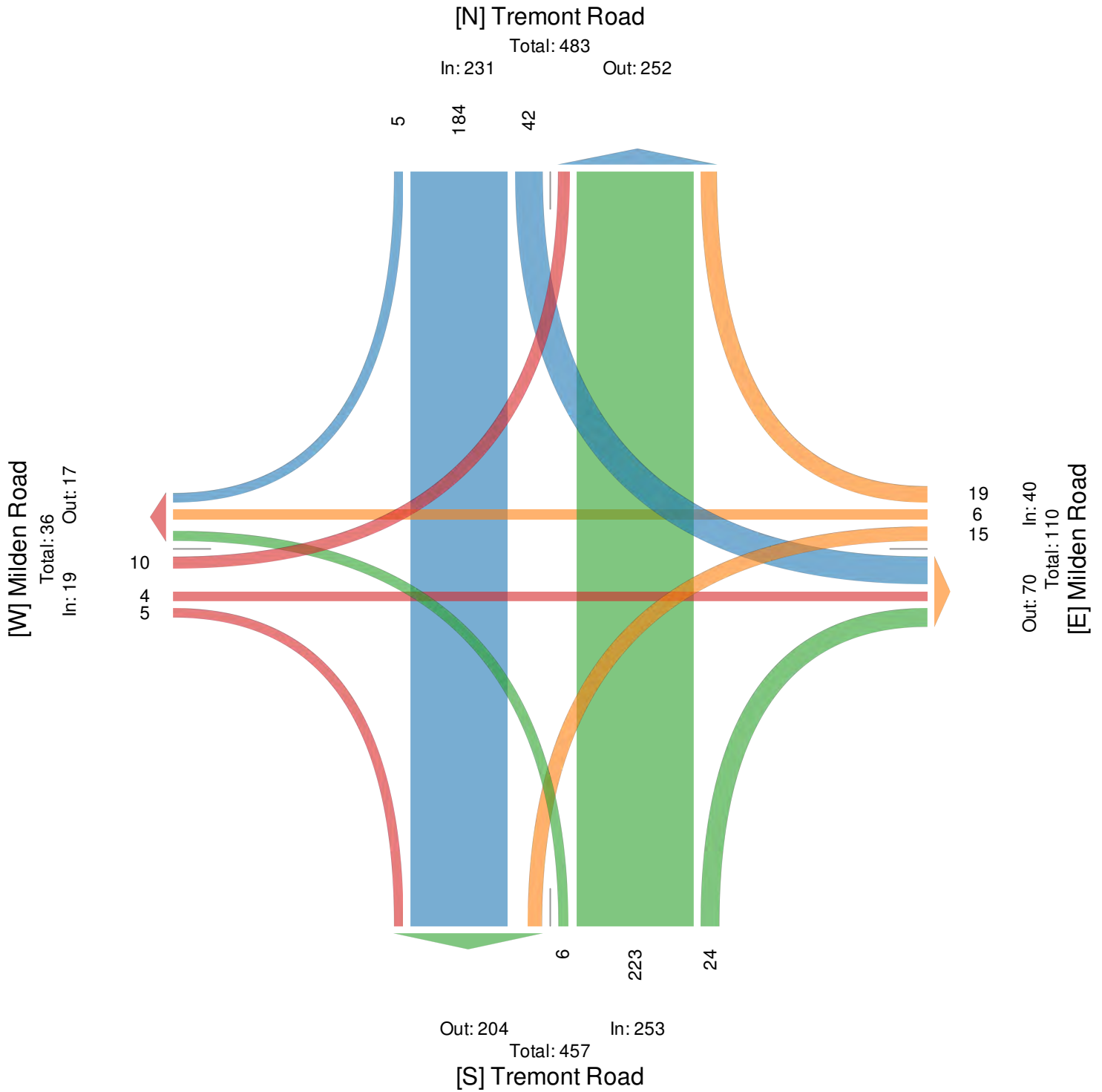
AM Peak (8 AM - 9 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775338, Location: 40.021222, -83.060943

Provided by: Carpenter Marty (CM) Transportation Inc.
6612 Singletree Drive, Columbus, OH, 43229, US



Tremont Road and Milden Road - TMC

Tue Aug 18, 2020

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775338, Location: 40.021222, -83.060943

Provided by: Carpenter Marty (CM) Transportation

Inc.

6612 Singletree Drive, Columbus, OH, 43229, US

Leg Direction	Milden Road Eastbound					Milden Road Westbound					Tremont Road Northbound					Tremont Road Southbound						
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int	
2020-08-18																						
4:45PM	6	2	0	0	8	13	4	22	0	39	4	58	15	0	77	15	75	4	0	94		218
5:00PM	7	3	2	0	12	9	5	18	0	32	2	81	16	0	99	12	74	0	0	86		229
5:15PM	4	6	2	0	12	17	3	12	0	32	4	62	24	0	90	29	79	2	0	110		244
5:30PM	7	2	1	0	10	13	8	20	0	41	1	66	19	0	86	22	75	6	0	103		240
Total	24	13	5	0	42	52	20	72	0	144	11	267	74	0	352	78	303	12	0	393		931
% Approach	57.1%	31.0%	11.9%	0%	-	36.1%	13.9%	50.0%	0%	-	3.1%	75.9%	21.0%	0%	-	19.8%	77.1%	3.1%	0%	-		-
% Total	2.6%	1.4%	0.5%	0%	4.5%	5.6%	2.1%	7.7%	0%	15.5%	1.2%	28.7%	7.9%	0%	37.8%	8.4%	32.5%	1.3%	0%	42.2%		-
PHF	0.857	0.542	0.625	-	0.875	0.765	0.625	0.818	-	0.878	0.688	0.824	0.771	-	0.889	0.672	0.959	0.500	-	0.893		0.954
Lights	24	12	5	0	41	52	20	72	0	144	11	264	74	0	349	78	301	12	0	391		925
% Lights	100%	92.3%	100%	0%	97.6%	100%	100%	100%	0%	100%	100%	98.9%	100%	0%	99.1%	100%	99.3%	100%	0%	99.5%		99.4%
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0		1
% Articulated Trucks	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.4%	0%	0%	0.3%	0%	0%	0%	0%	0%		0.1%
Buses and Single-Unit Trucks	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	2	0	0	2		5
% Buses and Single-Unit Trucks	0%	7.7%	0%	0%	2.4%	0%	0%	0%	0%	0%	0%	0.7%	0%	0%	0.6%	0%	0.7%	0%	0%	0.5%		0.5%

*L: Left, R: Right, T: Thru, U: U-Turn

Tremont Road and Milden Road - TMC

Tue Aug 18, 2020

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

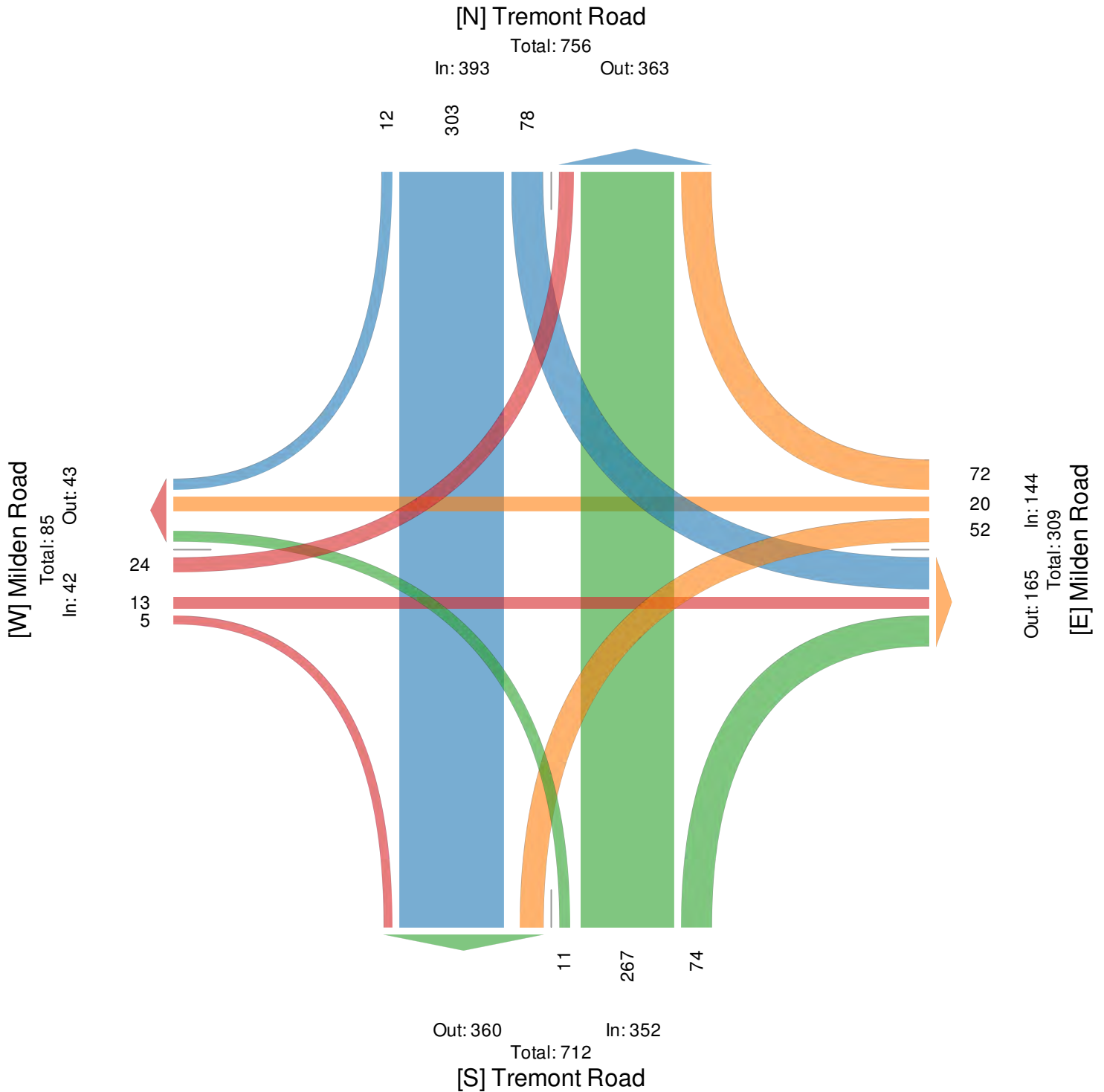
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775338, Location: 40.021222, -83.060943

Provided by: Carpenter Marty (CM) Transportation Inc.

6612 Singletree Drive, Columbus, OH, 43229, US



Tremont Road and Ridgecliff Road - TMC

Tue Aug 4, 2020

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773739, Location: 40.022472, -83.059861

Provided by: Carpenter Marty (CM) Transportation Inc.

6612 Singletree Drive, Columbus, OH, 43229, US

Leg Direction	Ridgecliff Road Eastbound				Tremont Road Northbound				Tremont Road Southbound				Int
	L	R	U	App	L	T	U	App	T	R	U	App	
2020-08-04 7:00AM	1	1	0	2	1	25	0	26	37	0	0	37	65
7:15AM	5	4	0	9	0	32	0	32	45	2	0	47	88
7:30AM	5	1	0	6	2	46	0	48	49	2	0	51	105
7:45AM	5	2	0	7	1	53	0	54	65	1	0	66	127
Hourly Total	16	8	0	24	4	156	0	160	196	5	0	201	385
8:00AM	3	0	0	3	0	40	0	40	58	3	0	61	104
8:15AM	6	3	0	9	0	66	0	66	51	1	0	52	127
8:30AM	5	1	0	6	2	69	0	71	62	2	0	64	141
8:45AM	4	2	0	6	3	79	0	82	84	4	0	88	176
Hourly Total	18	6	0	24	5	254	0	259	255	10	0	265	548
4:00PM	0	2	0	2	6	112	0	118	71	4	0	75	195
4:15PM	6	5	0	11	1	93	0	94	89	9	0	98	203
4:30PM	5	2	0	7	7	93	0	100	74	7	0	81	188
4:45PM	3	1	0	4	4	78	0	82	83	4	0	87	173
Hourly Total	14	10	0	24	18	376	0	394	317	24	0	341	759
5:00PM	4	2	0	6	1	98	0	99	95	9	0	104	209
5:15PM	7	3	0	10	6	66	0	72	93	4	0	97	179
5:30PM	8	5	0	13	2	80	0	82	76	9	0	85	180
5:45PM	5	4	0	9	5	85	0	90	80	3	0	83	182
Hourly Total	24	14	0	38	14	329	0	343	344	25	0	369	750
Total	72	38	0	110	41	1115	0	1156	1112	64	0	1176	2442
% Approach	65.5%	34.5%	0%	-	3.5%	96.5%	0%	-	94.6%	5.4%	0%	-	-
% Total	2.9%	1.6%	0%	4.5%	1.7%	45.7%	0%	47.3%	45.5%	2.6%	0%	48.2%	-
Lights	67	37	0	104	41	1092	0	1133	1100	60	0	1160	2397
% Lights	93.1%	97.4%	0%	94.5%	100%	97.9%	0%	98.0%	98.9%	93.8%	0%	98.6%	98.2%
Articulated Trucks	0	0	0	0	0	2	0	2	2	0	0	2	4
% Articulated Trucks	0%	0%	0%	0%	0%	0.2%	0%	0.2%	0.2%	0%	0%	0.2%	0.2%
Buses and Single-Unit Trucks	5	1	0	6	0	21	0	21	10	4	0	14	41
% Buses and Single-Unit Trucks	6.9%	2.6%	0%	5.5%	0%	1.9%	0%	1.8%	0.9%	6.3%	0%	1.2%	1.7%

*L: Left, R: Right, T: Thru, U: U-Turn

Tremont Road and Ridgecliff Road - TMC

Tue Aug 4, 2020

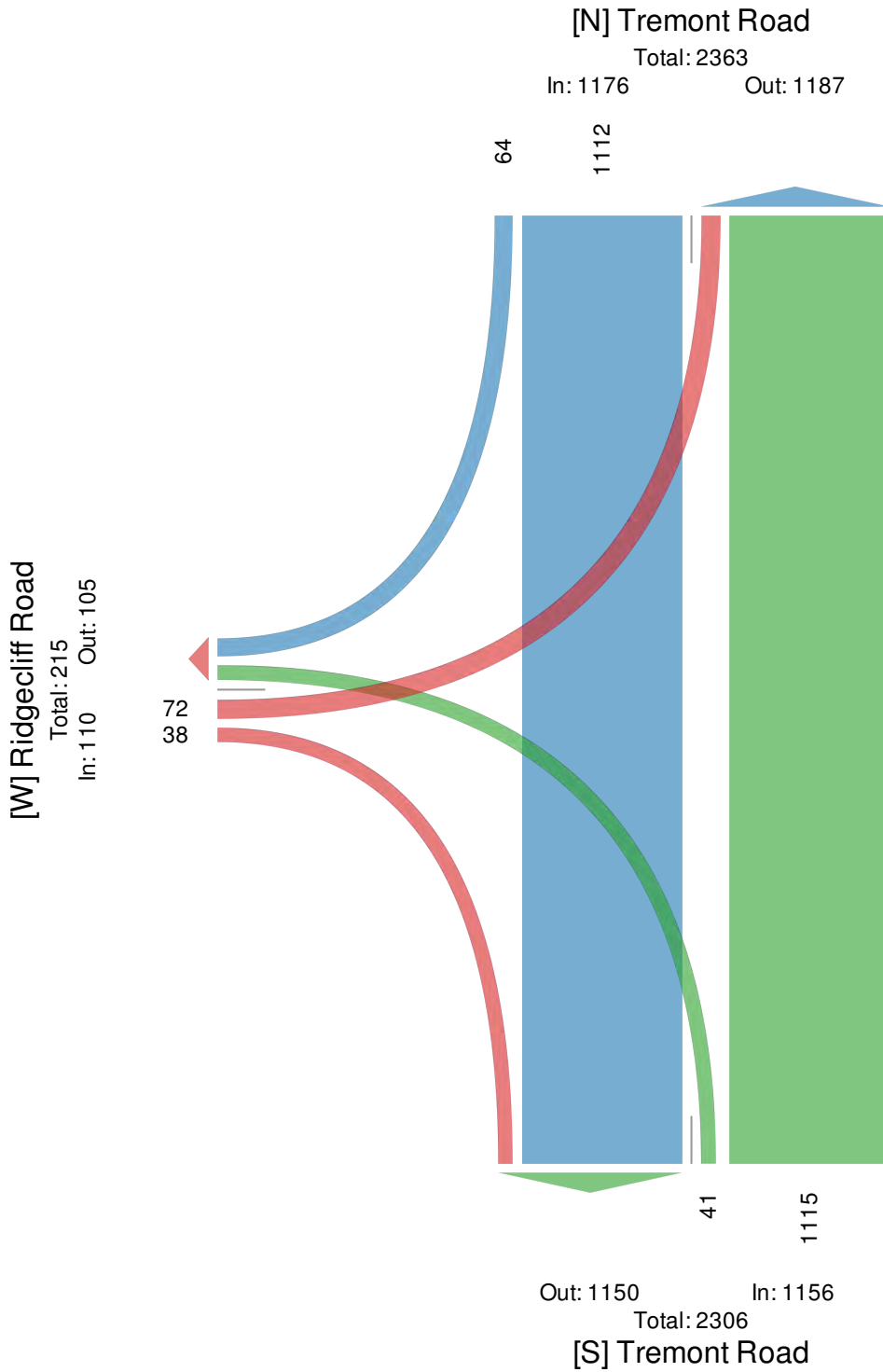
Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773739, Location: 40.022472, -83.059861

Provided by: Carpenter Marty (CM) Transportation Inc.
6612 Singletree Drive, Columbus, OH, 43229, US



Tremont Road and Ridgecliff Road - TMC

Tue Aug 4, 2020

AM Peak (8 AM - 9 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773739, Location: 40.022472, -83.059861

Provided by: Carpenter Marty (CM) Transportation

Inc.

6612 Singletree Drive, Columbus, OH, 43229, US

Leg Direction	Ridge cliff Road Eastbound				Tremont Road Northbound				Tremont Road Southbound				Int
	L	R	U	App	L	T	U	App	T	R	U	App	
Time													
2020-08-04 8:00AM	3	0	0	3	0	40	0	40	58	3	0	61	104
8:15AM	6	3	0	9	0	66	0	66	51	1	0	52	127
8:30AM	5	1	0	6	2	69	0	71	62	2	0	64	141
8:45AM	4	2	0	6	3	79	0	82	84	4	0	88	176
Total	18	6	0	24	5	254	0	259	255	10	0	265	548
% Approach	75.0%	25.0%	0%	-	1.9%	98.1%	0%	-	96.2%	3.8%	0%	-	-
% Total	3.3%	1.1%	0%	4.4%	0.9%	46.4%	0%	47.3%	46.5%	1.8%	0%	48.4%	-
PHF	0.750	0.500	-	0.667	0.417	0.804	-	0.790	0.759	0.625	-	0.753	0.778
Lights	16	6	0	22	5	247	0	252	249	9	0	258	532
% Lights	88.9%	100%	0%	91.7%	100%	97.2%	0%	97.3%	97.6%	90.0%	0%	97.4%	97.1%
Articulated Trucks	0	0	0	0	0	1	0	1	2	0	0	2	3
% Articulated Trucks	0%	0%	0%	0%	0%	0.4%	0%	0.4%	0.8%	0%	0%	0.8%	0.5%
Buses and Single-Unit Trucks	2	0	0	2	0	6	0	6	4	1	0	5	13
% Buses and Single-Unit Trucks	11.1%	0%	0%	8.3%	0%	2.4%	0%	2.3%	1.6%	10.0%	0%	1.9%	2.4%

*L: Left, R: Right, T: Thru, U: U-Turn

Tremont Road and Ridgecliff Road - TMC

Tue Aug 4, 2020

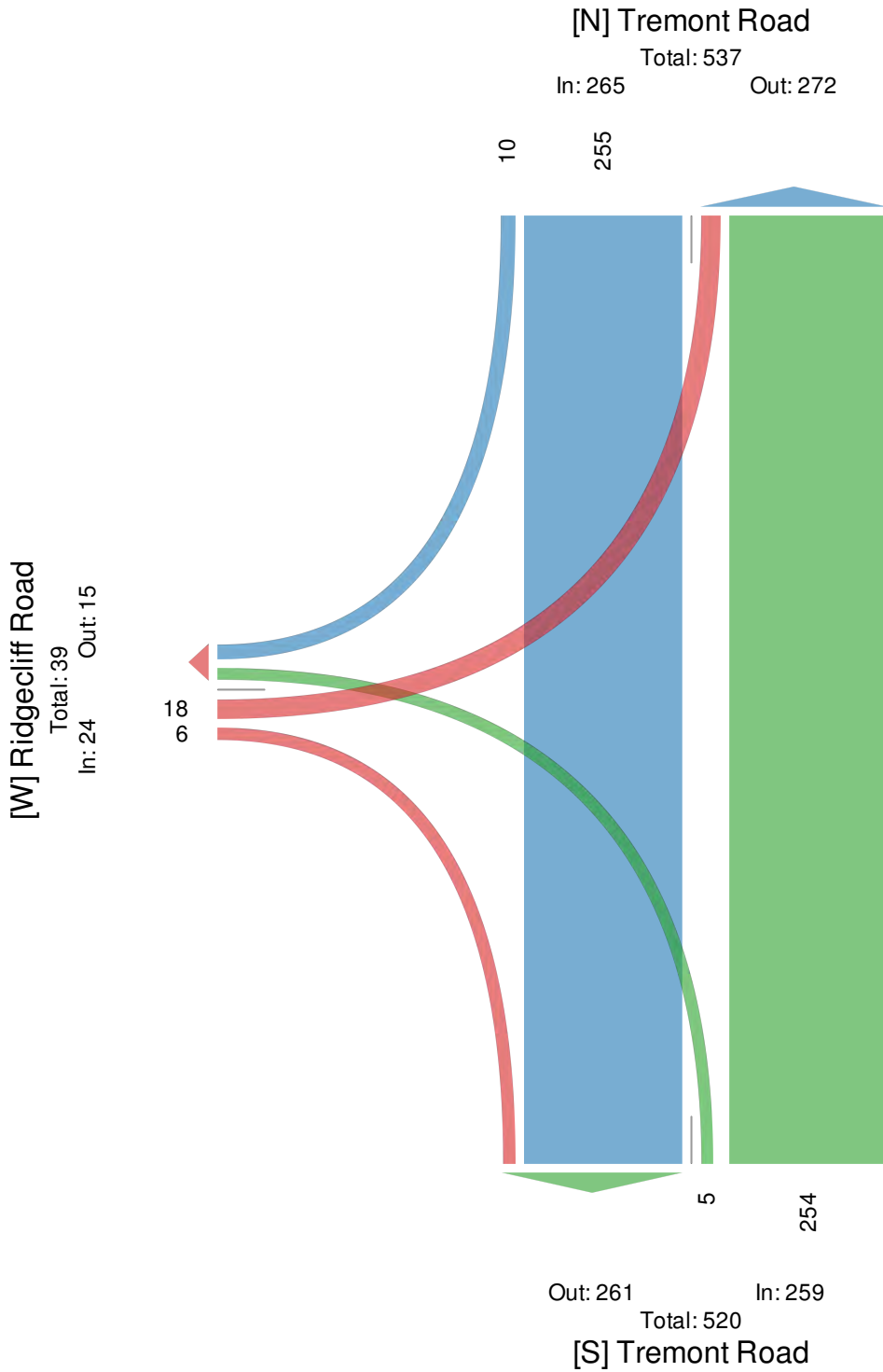
AM Peak (8 AM - 9 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773739, Location: 40.022472, -83.059861

Provided by: Carpenter Marty (CM) Transportation Inc.
6612 Singletree Drive, Columbus, OH, 43229, US



Tremont Road and Ridgecliff Road - TMC

Tue Aug 4, 2020

PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773739, Location: 40.022472, -83.059861

Provided by: Carpenter Marty (CM) Transportation

Inc.

6612 Singletree Drive, Columbus, OH, 43229, US

Leg Direction	Ridgecliff Road Eastbound				Tremont Road Northbound				Tremont Road Southbound				Int
	L	R	U	App	L	T	U	App	T	R	U	App	
Time													
2020-08-04 4:15PM	6	5	0	11	1	93	0	94	89	9	0	98	203
4:30PM	5	2	0	7	7	93	0	100	74	7	0	81	188
4:45PM	3	1	0	4	4	78	0	82	83	4	0	87	173
5:00PM	4	2	0	6	1	98	0	99	95	9	0	104	209
Total	18	10	0	28	13	362	0	375	341	29	0	370	773
% Approach	64.3%	35.7%	0%	-	3.5%	96.5%	0%	-	92.2%	7.8%	0%	-	-
% Total	2.3%	1.3%	0%	3.6%	1.7%	46.8%	0%	48.5%	44.1%	3.8%	0%	47.9%	-
PHF	0.750	0.500	-	0.636	0.464	0.923	-	0.938	0.897	0.806	-	0.889	0.925
Lights	17	10	0	27	13	358	0	371	339	28	0	367	765
% Lights	94.4%	100%	0%	96.4%	100%	98.9%	0%	98.9%	99.4%	96.6%	0%	99.2%	99.0%
Articulate d Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulate d Trucks	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Buses and Single-Unit Trucks	1	0	0	1	0	4	0	4	2	1	0	3	8
% Buses and Single-Unit Trucks	5.6%	0%	0%	3.6%	0%	1.1%	0%	1.1%	0.6%	3.4%	0%	0.8%	1.0%

*L: Left, R: Right, T: Thru, U: U-Turn

Tremont Road and Ridgecliff Road - TMC

Tue Aug 4, 2020

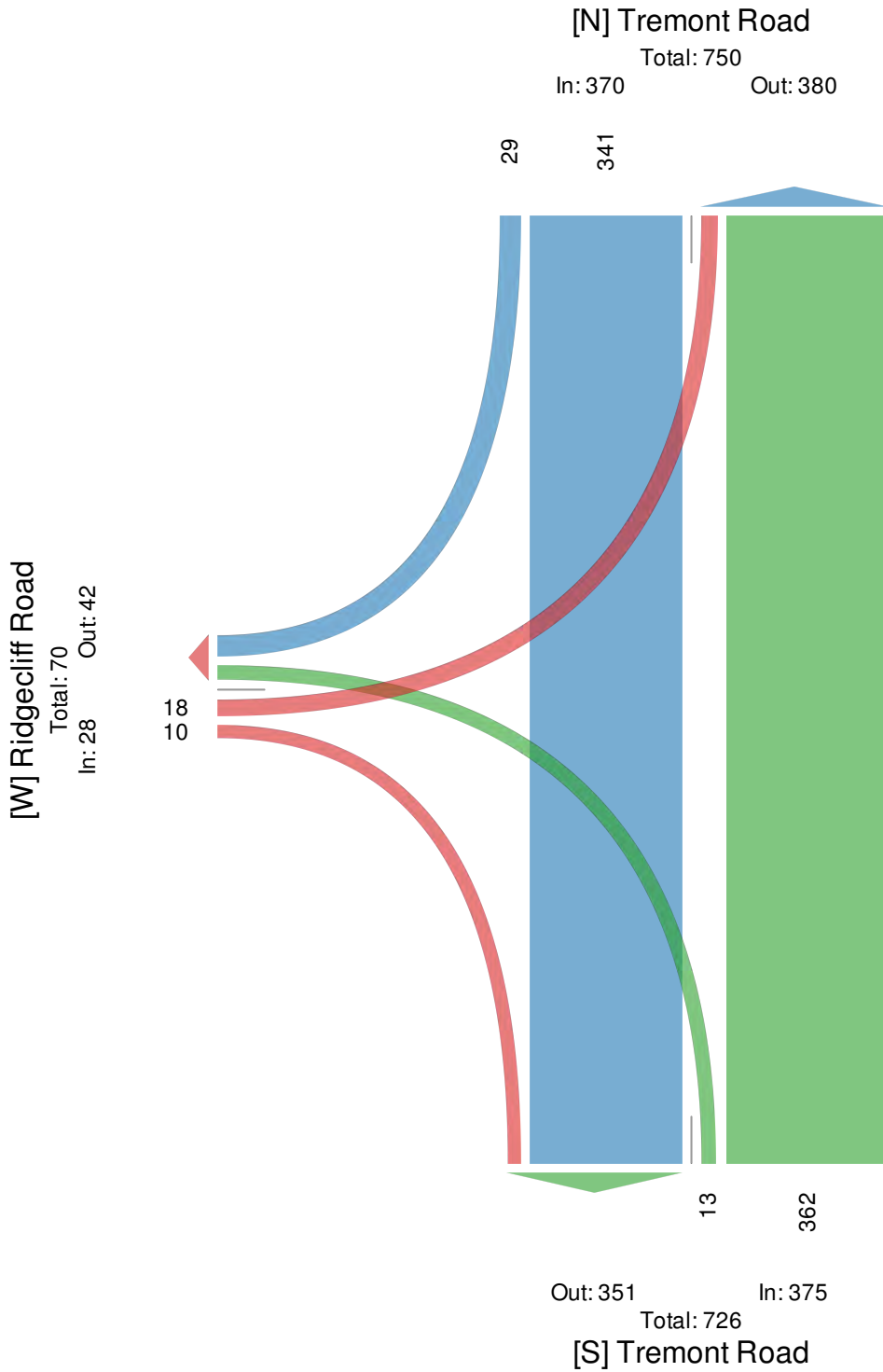
PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 773739, Location: 40.022472, -83.059861

Provided by: Carpenter Marty (CM) Transportation Inc.
6612 Singletree Drive, Columbus, OH, 43229, US



Tremont Road and Zollinger Road - TMC

Tue Aug 18, 2020

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775341, Location: 40.018994, -83.062876

Provided by: Carpenter Marty (CM) Transportation

Inc.

6612 Singletree Drive, Columbus, OH, 43229, US

Leg Direction	Zollinger Road Eastbound					Zollinger Road Westbound					Tremont Road Northbound					Tremont Road Southbound					Int
	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	
2020-08-18																					
7:00AM	15	10	2	0	27	1	5	2	0	8	3	20	6	0	29	3	18	8	0	29	93
7:15AM	9	28	2	0	39	1	6	2	0	9	0	21	4	0	25	3	20	8	0	31	104
7:30AM	14	33	1	0	48	1	8	5	0	14	0	25	7	0	32	3	21	11	0	35	129
7:45AM	15	31	14	0	60	2	10	5	0	17	1	39	6	0	46	4	29	16	0	49	172
Hourly Total	53	102	19	0	174	5	29	14	0	48	4	105	23	0	132	13	88	43	0	144	498
8:00AM	15	37	0	0	52	0	9	1	0	10	2	30	3	0	35	10	21	12	0	43	140
8:15AM	20	31	2	0	53	3	13	13	0	29	2	32	4	0	38	6	32	10	0	48	168
8:30AM	21	34	3	0	58	6	16	6	0	28	0	38	5	0	43	6	33	10	0	49	178
8:45AM	13	29	6	0	48	5	21	6	0	32	3	41	8	0	52	3	37	12	0	52	184
Hourly Total	69	131	11	0	211	14	59	26	0	99	7	141	20	0	168	25	123	44	0	192	670
4:00PM	21	33	6	0	60	16	27	12	0	55	11	57	4	0	72	9	47	17	0	73	260
4:15PM	13	37	5	0	55	10	37	9	0	56	6	56	2	0	64	7	46	9	0	62	237
4:30PM	22	32	6	0	60	13	36	16	0	65	3	39	14	0	56	5	69	17	0	91	272
4:45PM	14	39	12	0	65	11	38	14	0	63	7	49	5	0	61	5	67	15	0	87	276
Hourly Total	70	141	29	0	240	50	138	51	0	239	27	201	25	0	253	26	229	58	0	313	1045
5:00PM	20	40	12	0	72	14	41	15	0	70	13	73	12	0	98	6	51	22	0	79	319
5:15PM	27	42	8	0	77	8	35	9	0	52	7	63	12	0	82	12	73	18	0	103	314
5:30PM	17	23	6	0	46	10	39	12	0	61	6	67	5	0	78	4	60	22	0	86	271
5:45PM	14	33	13	0	60	12	49	10	0	71	4	57	7	0	68	6	55	21	0	82	281
Hourly Total	78	138	39	0	255	44	164	46	0	254	30	260	36	0	326	28	239	83	0	350	1185
Total	270	512	98	0	880	113	390	137	0	640	68	707	104	0	879	92	679	228	0	999	3398
% Approach	30.7%	58.2%	11.1%	0%	-	17.7%	60.9%	21.4%	0%	-	7.7%	80.4%	11.8%	0%	-	9.2%	68.0%	22.8%	0%	-	-
% Total	7.9%	15.1%	2.9%	0%	25.9%	3.3%	11.5%	4.0%	0%	18.8%	2.0%	20.8%	3.1%	0%	25.9%	2.7%	20.0%	6.7%	0%	29.4%	-
Lights	266	503	95	0	864	112	385	128	0	625	68	704	103	0	875	91	675	227	0	993	3357
% Lights	98.5%	98.2%	96.9%	0%	98.2%	99.1%	98.7%	93.4%	0%	97.7%	100%	99.6%	99.0%	0%	99.5%	98.9%	99.4%	99.6%	0%	99.4%	98.8%
Articulated Trucks	0	1	0	0	1	1	2	0	0	3	0	0	0	0	0	0	2	0	0	2	6
% Articulated Trucks	0%	0.2%	0%	0%	0.1%	0.9%	0.5%	0%	0%	0.5%	0%	0%	0%	0%	0%	0%	0.3%	0%	0%	0.2%	0.2%
Buses and Single-Unit Trucks	4	8	3	0	15	0	3	9	0	12	0	3	1	0	4	1	2	1	0	4	35
% Buses and Single-Unit Trucks	1.5%	1.6%	3.1%	0%	1.7%	0%	0.8%	6.6%	0%	1.9%	0%	0.4%	1.0%	0%	0.5%	1.1%	0.3%	0.4%	0%	0.4%	1.0%

*L: Left, R: Right, T: Thru, U: U-Turn

Tremont Road and Zollinger Road - TMC

Tue Aug 18, 2020

Full Length (7 AM-9 AM, 4 PM-6 PM)

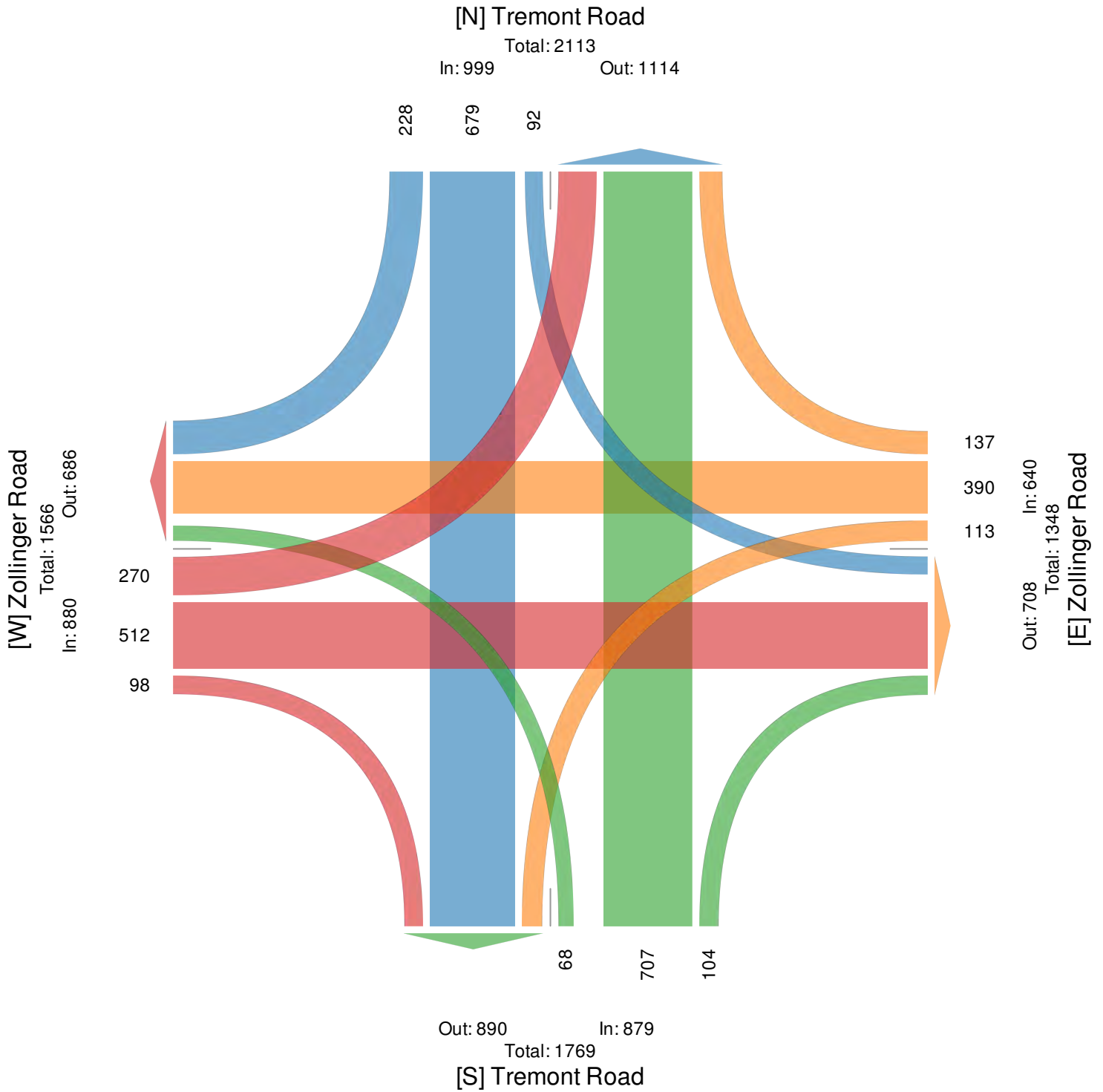
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775341, Location: 40.018994, -83.062876

Provided by: Carpenter Marty (CM) Transportation Inc.

6612 Singletree Drive, Columbus, OH, 43229, US



Tremont Road and Zollinger Road - TMC

Tue Aug 18, 2020

AM Peak (8 AM - 9 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775341, Location: 40.018994, -83.062876

Provided by: Carpenter Marty (CM) Transportation

Inc.

6612 Singletree Drive, Columbus, OH, 43229, US

Leg Direction	Zollinger Road Eastbound					Zollinger Road Westbound					Tremont Road Northbound					Tremont Road Southbound					Int
	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	
2020-08-18																					
8:00AM	15	37	0	0	52	0	9	1	0	10	2	30	3	0	35	10	21	12	0	43	140
8:15AM	20	31	2	0	53	3	13	13	0	29	2	32	4	0	38	6	32	10	0	48	168
8:30AM	21	34	3	0	58	6	16	6	0	28	0	38	5	0	43	6	33	10	0	49	178
8:45AM	13	29	6	0	48	5	21	6	0	32	3	41	8	0	52	3	37	12	0	52	184
Total	69	131	11	0	211	14	59	26	0	99	7	141	20	0	168	25	123	44	0	192	670
% Approach	32.7%	62.1%	5.2%	0%	-	14.1%	59.6%	26.3%	0%	-	4.2%	83.9%	11.9%	0%	-	13.0%	64.1%	22.9%	0%	-	-
% Total	10.3%	19.6%	1.6%	0%	31.5%	2.1%	8.8%	3.9%	0%	14.8%	1.0%	21.0%	3.0%	0%	25.1%	3.7%	18.4%	6.6%	0%	28.7%	-
PHF	0.821	0.885	0.458	-	0.909	0.583	0.702	0.500	-	0.773	0.583	0.860	0.625	-	0.808	0.625	0.831	0.917	-	0.923	0.910
Lights	69	126	10	0	205	13	56	23	0	92	7	140	20	0	167	25	122	44	0	191	655
% Lights	100%	96.2%	90.9%	0%	97.2%	92.9%	94.9%	88.5%	0%	92.9%	100%	99.3%	100%	0%	99.4%	100%	99.2%	100%	0%	99.5%	97.8%
Articulate d Trucks	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	0	1	0	0	1	4
% Articulate d Trucks	0%	0%	0%	0%	0%	7.1%	3.4%	0%	0%	3.0%	0%	0%	0%	0%	0%	0%	0.8%	0%	0%	0.5%	0.6%
Buses and Single-Unit Trucks	0	5	1	0	6	0	1	3	0	4	0	1	0	0	1	0	0	0	0	0	11
% Buses and Single-Unit Trucks	0%	3.8%	9.1%	0%	2.8%	0%	1.7%	11.5%	0%	4.0%	0%	0.7%	0%	0%	0.6%	0%	0%	0%	0%	0%	1.6%

* L: Left, R: Right, T: Thru, U: U-Turn

Tremont Road and Zollinger Road - TMC

Tue Aug 18, 2020

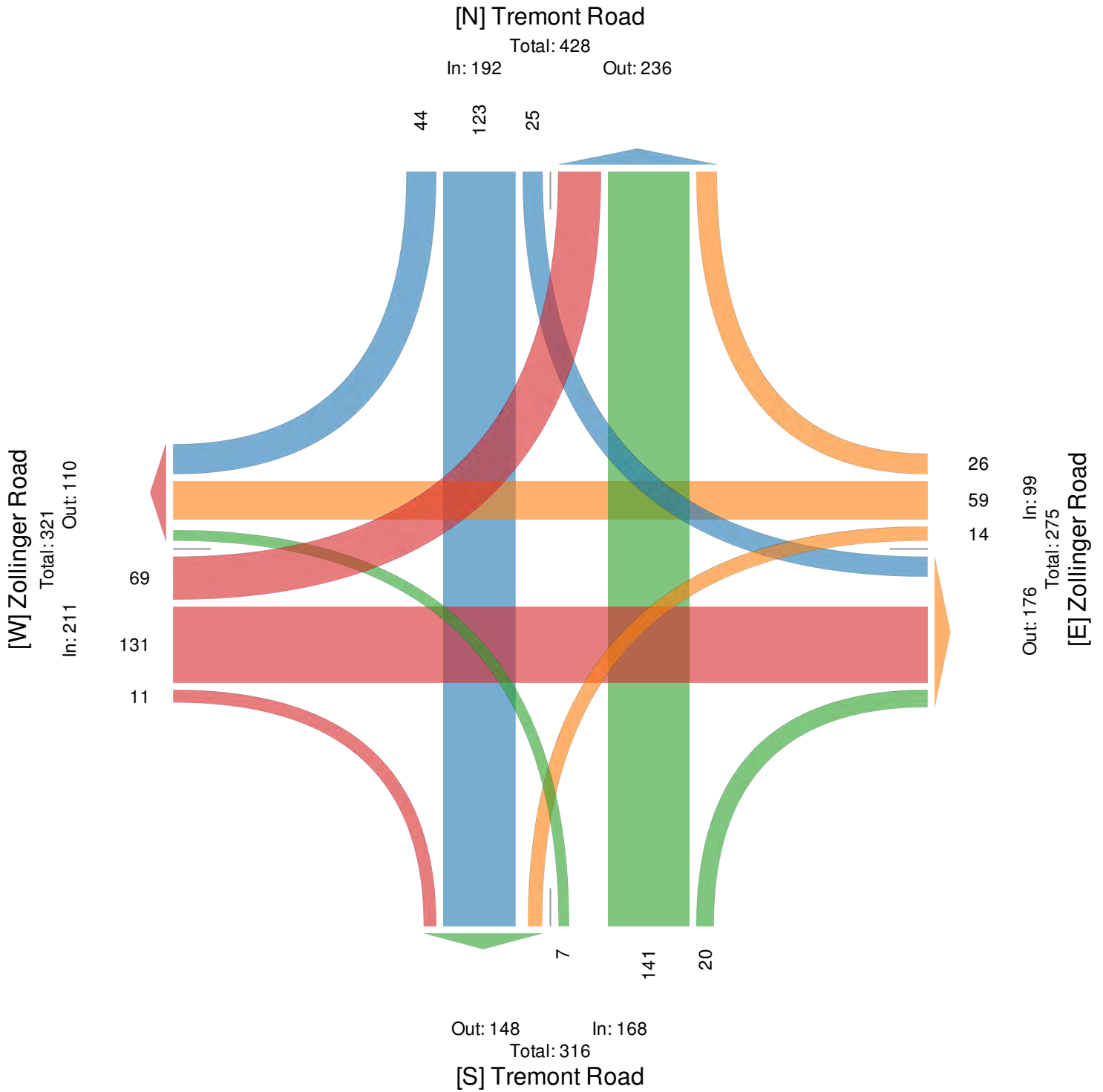
AM Peak (8 AM - 9 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775341, Location: 40.018994, -83.062876

Provided by: Carpenter Marty (CM) Transportation Inc.
6612 Singletree Drive, Columbus, OH, 43229, US



Tremont Road and Zollinger Road - TMC

Tue Aug 18, 2020

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775341, Location: 40.018994, -83.062876

Provided by: Carpenter Marty (CM) Transportation

Inc.

6612 Singletree Drive, Columbus, OH, 43229, US

Leg Direction	Zollinger Road Eastbound					Zollinger Road Westbound					Tremont Road Northbound					Tremont Road Southbound					Int
	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	
2020-08-18																					
5:00PM	20	40	12	0	72	14	41	15	0	70	13	73	12	0	98	6	51	22	0	79	319
5:15PM	27	42	8	0	77	8	35	9	0	52	7	63	12	0	82	12	73	18	0	103	314
5:30PM	17	23	6	0	46	10	39	12	0	61	6	67	5	0	78	4	60	22	0	86	271
5:45PM	14	33	13	0	60	12	49	10	0	71	4	57	7	0	68	6	55	21	0	82	281
Total	78	138	39	0	255	44	164	46	0	254	30	260	36	0	326	28	239	83	0	350	1185
% Approach	30.6%	54.1%	15.3%	0%	-	17.3%	64.6%	18.1%	0%	-	9.2%	79.8%	11.0%	0%	-	8.0%	68.3%	23.7%	0%	-	-
% Total	6.6%	11.6%	3.3%	0%	21.5%	3.7%	13.8%	3.9%	0%	21.4%	2.5%	21.9%	3.0%	0%	27.5%	2.4%	20.2%	7.0%	0%	29.5%	-
PHF	0.722	0.821	0.750	-	0.828	0.786	0.837	0.767	-	0.894	0.577	0.890	0.750	-	0.832	0.583	0.818	0.943	-	0.850	0.929
Lights	78	138	38	0	254	44	163	44	0	251	30	260	36	0	326	28	239	83	0	350	1181
% Lights	100%	100%	97.4%	0%	99.6%	100%	99.4%	95.7%	0%	98.8%	100%	100%	100%	0%	100%	100%	100%	100%	0%	100%	99.7%
Articulate d Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulate d Trucks	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Buses and Single-Unit Trucks	0	0	1	0	1	0	1	2	0	3	0	0	0	0	0	0	0	0	0	0	4
% Buses and Single-Unit Trucks	0%	0%	2.6%	0%	0.4%	0%	0.6%	4.3%	0%	1.2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.3%

* L: Left, R: Right, T: Thru, U: U-Turn

Tremont Road and Zollinger Road - TMC

Tue Aug 18, 2020

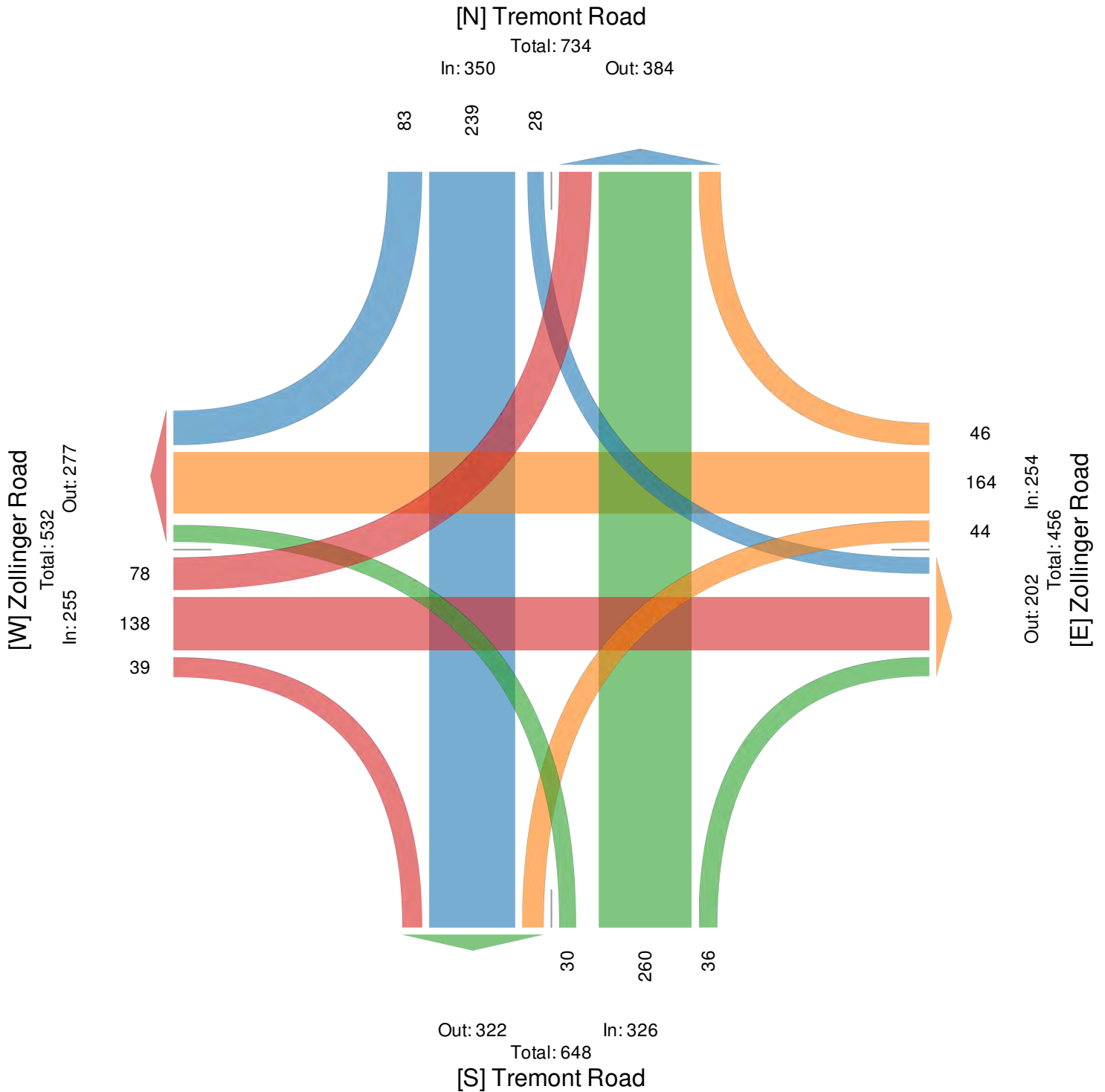
PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 775341, Location: 40.018994, -83.062876

Provided by: Carpenter Marty (CM) Transportation Inc.
6612 Singletree Drive, Columbus, OH, 43229, US





Search | Back | Cars |

Calculate Peak Hour for:

Intersection

Turning Movement Count Data - 6759

Int ID: 6759

Community:

Road 1: TREMONT RD
Road 2: MILDEN RD

Corridor:

Road 3:
Road 4:

TMC Data

Display	Date	PHV	Peak Hour	Duration	TMC Owner
<input checked="" type="radio"/>	Wednesday, August 27, 2014	1103	5:00 PM	7:00 AM - 6:00 PM	morpc

<< < > >> 1-1 of 1 mm/dd/yyyy

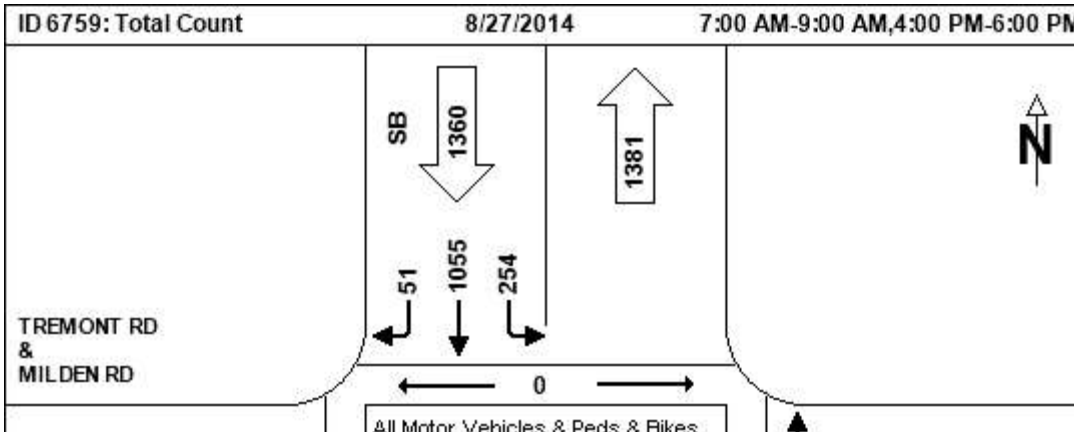
Notes		Date
Note	Date	

NB **EB** **SB** **WB**

Vehicles

Start Time	Left	Thru	Right	Ped	Total
7:00 AM	4	2	3	0	9
7:15 AM	7	0	0	0	7
7:30 AM	2	1	0	0	3
7:45 AM	2	2	1	0	5
8:00 AM	12	4	0	0	16
8:15 AM	9	2	1	0	12
8:30 AM	7	2	1	0	10
8:45 AM	1	4	3	0	8
4:00 PM	3	6	3	0	12
4:15 PM	5	4	2	0	11
4:30 PM	3	4	2	0	9
4:45 PM	2	4	4	0	10
5:00 PM	6	6	2	0	14
5:15 PM	6	4	4	0	14
5:30 PM	7	4	0	0	11
5:45 PM	5	6	2	0	13
Total	81	55	28	0	164
App %	49.39	33.54	17.07		
Total %	2.47	1.68	0.85		5.00

Cars Trucks Pedestrians Bikes





Search | Back | Cars |

Calculate Peak Hour for:

Intersection

Turning Movement Count Data - 6759

Int ID: 6759

Community:

Road 1: TREMONT RD

Road 2: MILDEN RD

Corridor:

Road 3:

Road 4:

TMC Data

Display	Date	PHV	Peak Hour	Duration	TMC Owner
<input checked="" type="radio"/>	Wednesday, August 27, 2014	1103	5:00 PM	7:00 AM - 6:00 PM	morpc

<< < > >> 1-1 of 1 mm/dd/yyyy

Notes

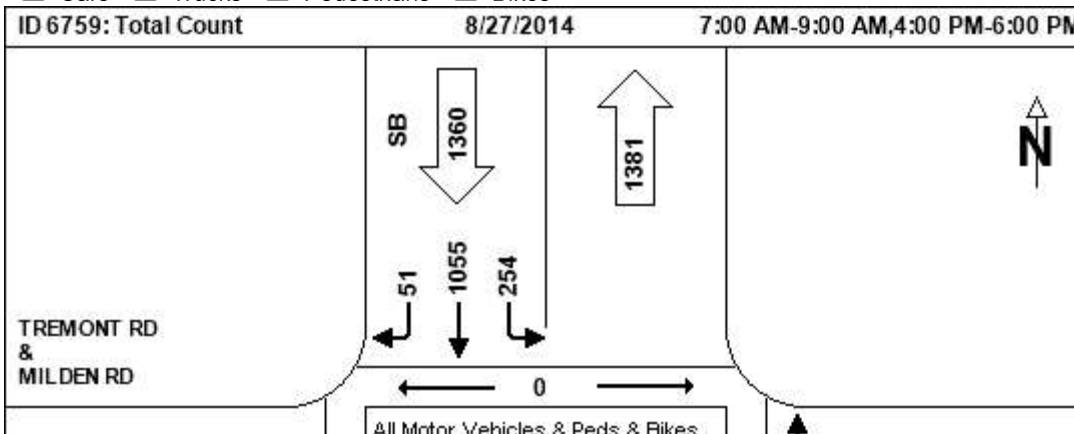
Note	Date

NB EB SB WB

Vehicles

Start Time	Left	Thru	Right	Ped	Total
7:00 AM	0	41	3	0	44
7:15 AM	0	55	2	0	57
7:30 AM	2	68	11	0	81
7:45 AM	1	68	0	0	69
8:00 AM	3	86	9	0	98
8:15 AM	1	74	11	0	86
8:30 AM	0	49	15	0	64
8:45 AM	0	63	6	0	69
4:00 PM	2	72	24	0	98
4:15 PM	1	90	20	0	111
4:30 PM	5	59	19	0	83
4:45 PM	5	70	12	0	87
5:00 PM	4	84	24	0	112
5:15 PM	5	70	27	0	102
5:30 PM	3	66	18	0	87
5:45 PM	5	63	32	0	100
Total	37	1078	233	0	1348
App %	2.74	79.97	17.28		
Total %	1.13	32.89	7.11		41.12

Cars Trucks Pedestrians Bikes





Search | Back | Cars |

Calculate Peak Hour for:

Intersection

Turning Movement Count Data - 6759

Int ID: 6759

Community:

Road 1: TREMONT RD

Road 2: MILDEN RD

Corridor:

Road 3:

Road 4:

TMC Data

Display	Date	PHV	Peak Hour	Duration	TMC Owner
<input checked="" type="radio"/>	Wednesday, August 27, 2014	1103	5:00 PM	7:00 AM - 6:00 PM	morpc

<< < > >> 1-1 of 1 mm/dd/yyyy

Notes

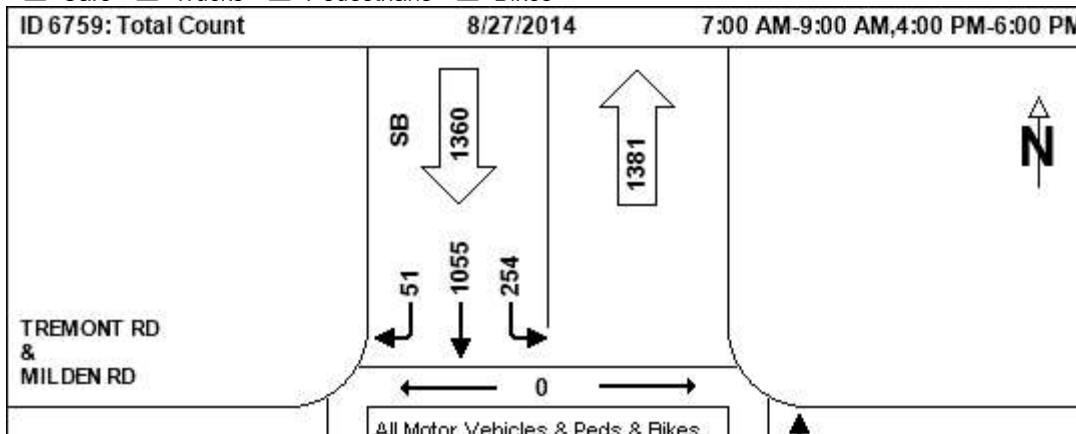
Note	Date

NB **EB** **SB** **WB**

Vehicles

Start Time	Left	Thru	Right	Ped	Total
7:00 AM	0	32	2	0	34
7:15 AM	4	54	1	0	59
7:30 AM	6	61	1	0	68
7:45 AM	5	73	1	0	79
8:00 AM	6	67	2	0	75
8:15 AM	12	42	0	0	54
8:30 AM	4	48	3	0	55
8:45 AM	10	49	3	0	62
4:00 PM	25	70	5	0	100
4:15 PM	18	82	3	0	103
4:30 PM	18	71	3	0	92
4:45 PM	32	80	4	0	116
5:00 PM	23	85	5	0	113
5:15 PM	30	68	6	0	104
5:30 PM	28	78	6	0	112
5:45 PM	33	95	6	0	134
Total	254	1055	51	0	1360
App %	18.68	77.57	3.75		
Total %	7.75	32.18	1.56		41.49

Cars Trucks Pedestrians Bikes





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Calculate Peak Hour for:

Intersection

Turning Movement Count Data - 6759

Int ID: 6759

Community:

Road 1: TREMONT RD

Road 2: MILDEN RD

Corridor:

Road 3:

Road 4:

TMC Data

Display	Date	PHV	Peak Hour	Duration	TMC Owner
<input checked="" type="radio"/>	Wednesday, August 27, 2014	1103	5:00 PM	7:00 AM - 6:00 PM	morpc

<< < > >> 1-1 of 1 mm/dd/yyyy

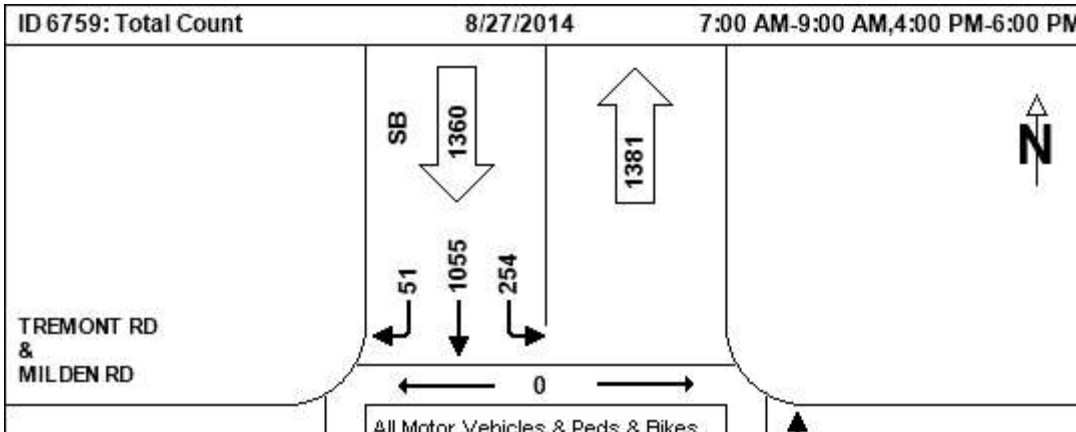
Notes		Date
Note	Date	

NB **EB** **SB** **WB**

Vehicles

Start Time	Left	Thru	Right	Ped	Total
7:00 AM	1	0	1	0	2
7:15 AM	1	1	1	0	3
7:30 AM	0	1	1	0	2
7:45 AM	0	1	4	0	5
8:00 AM	2	0	9	0	11
8:15 AM	3	0	6	0	9
8:30 AM	1	2	6	0	9
8:45 AM	5	0	8	0	13
4:00 PM	9	6	36	0	51
4:15 PM	12	7	21	0	40
4:30 PM	7	8	23	0	38
4:45 PM	10	9	17	0	36
5:00 PM	17	7	18	0	42
5:15 PM	20	12	24	0	56
5:30 PM	18	7	26	0	51
5:45 PM	10	7	21	0	38
Total	116	68	222	0	406
App %	28.57	16.75	54.68		
Total %	3.54	2.07	6.77		12.39

Cars Trucks Pedestrians Bikes





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Calculate Peak Hour for:

Intersection Corridor: NA

Turning Movement Count Data - 4357

Int ID: 4357
Community: UPPER ARLINGTON **Corridor:** NA
Road 1: TREMONT RD **Road 3:**
Road 2: ZOLLINGER RD **Road 4:**

TMC Data

Display	Date	PHV	Peak Hour	Duration	TMC Owner
<input checked="" type="radio"/>	Tuesday, August 26, 2014	1354	5:00 PM	7:00 AM - 6:00 PM	morpc

|<< < > >>| 1-1 of 1 mm/dd/yyyy

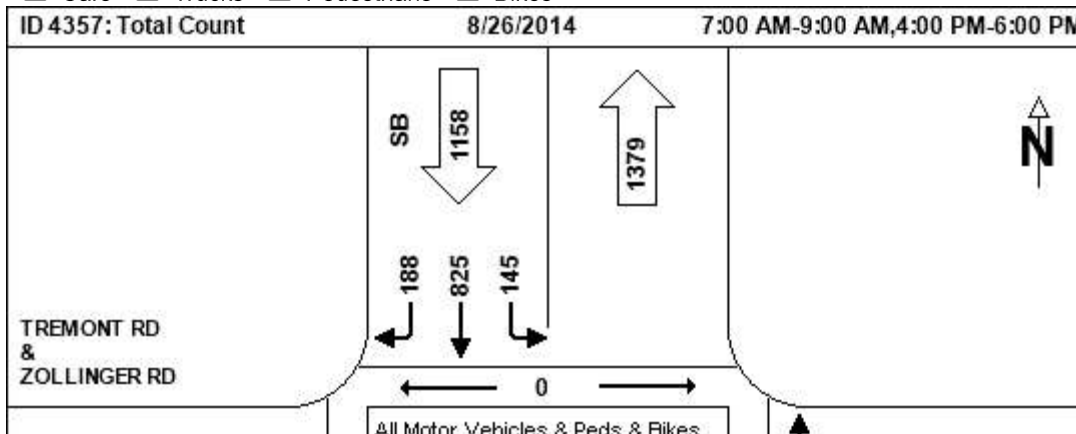
Notes		Date
Note		

NB **EB** **SB** **WB**

Vehicles

Start Time	Left	Thru	Right	Ped	Total
7:00 AM	11	56	3	0	70
7:15 AM	15	69	6	0	90
7:30 AM	17	128	4	0	149
7:45 AM	14	102	17	0	133
8:00 AM	21	76	13	0	110
8:15 AM	19	50	5	0	74
8:30 AM	22	41	4	0	67
8:45 AM	22	36	4	0	62
4:00 PM	14	31	6	0	51
4:15 PM	13	30	3	0	46
4:30 PM	22	37	6	0	65
4:45 PM	13	40	2	0	55
5:00 PM	20	45	2	0	67
5:15 PM	16	45	14	0	75
5:30 PM	26	35	6	0	67
5:45 PM	19	35	10	0	64
Total	284	856	105	0	1245
App %	22.81	68.76	8.43		
Total %	6.22	18.75	2.30		27.27

Cars Trucks Pedestrians Bikes





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Calculate Peak Hour for:

Intersection Corridor: NA

Turning Movement Count Data - 4357

Int ID: 4357

Community: UPPER ARLINGTON

Corridor: NA

Road 1: TREMONT RD

Road 3:

Road 2: ZOLLINGER RD

Road 4:

TMC Data

Display	Date	PHV	Peak Hour	Duration	TMC Owner
<input checked="" type="radio"/>	Tuesday, August 26, 2014	1354	5:00 PM	7:00 AM - 6:00 PM	morpc

|<< < > >>| 1-1 of 1 mm/dd/yyyy

Notes

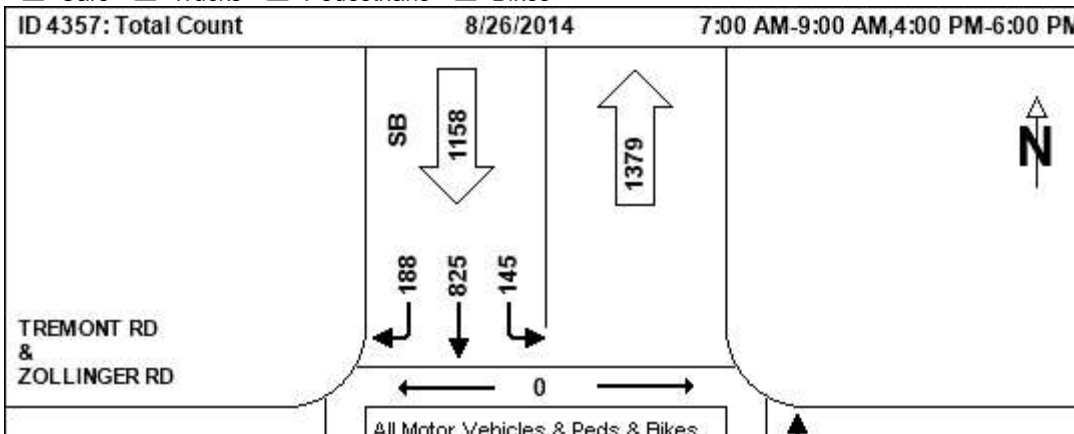
Note	Date

NB EB SB WB

Vehicles

Start Time	Left	Thru	Right	Ped	Total
7:00 AM	3	25	3	0	31
7:15 AM	4	51	7	0	62
7:30 AM	2	40	8	0	50
7:45 AM	4	46	17	0	67
8:00 AM	24	55	10	0	89
8:15 AM	5	59	6	0	70
8:30 AM	2	52	8	0	62
8:45 AM	2	40	5	0	47
4:00 PM	9	79	12	0	100
4:15 PM	4	68	8	0	80
4:30 PM	4	66	10	0	80
4:45 PM	2	85	5	0	92
5:00 PM	6	67	13	0	86
5:15 PM	6	70	10	0	86
5:30 PM	7	72	7	0	86
5:45 PM	6	77	11	0	94
Total	90	952	140	0	1182
App %	7.61	80.54	11.84		
Total %	1.97	20.85	3.07		25.89

Cars Trucks Pedestrians Bikes





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Calculate Peak Hour for:

Intersection Corridor: NA

Turning Movement Count Data - 4357

Int ID: 4357

Community: UPPER ARLINGTON

Corridor: NA

Road 1: TREMONT RD

Road 3:

Road 2: ZOLLINGER RD

Road 4:

TMC Data

Display	Date	PHV	Peak Hour	Duration	TMC Owner
<input checked="" type="radio"/>	Tuesday, August 26, 2014	1354	5:00 PM	7:00 AM - 6:00 PM	morpc

|<< < > >>| 1-1 of 1 mm/dd/yyyy

Notes

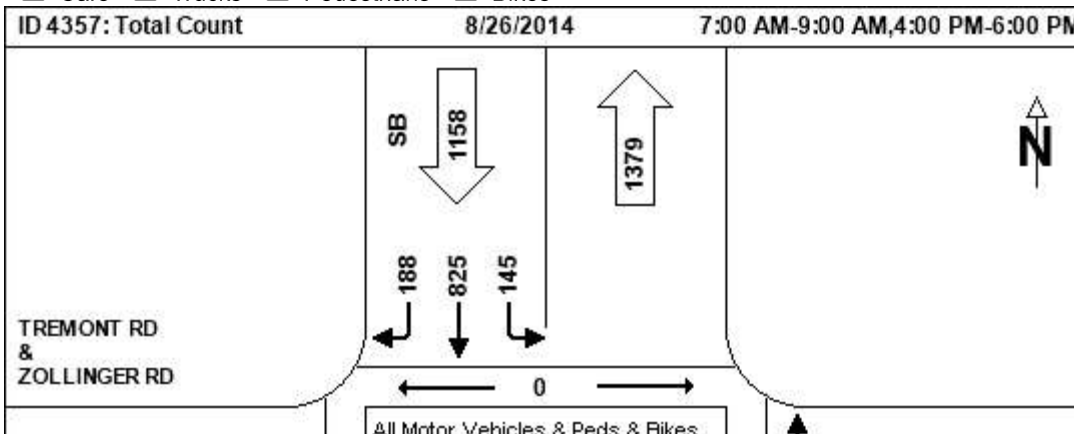
Note	Date

NB **EB** **SB** **WB**

Vehicles

Start Time	Left	Thru	Right	Ped	Total
7:00 AM	10	18	5	0	33
7:15 AM	11	33	3	0	47
7:30 AM	14	34	9	0	57
7:45 AM	16	47	10	0	73
8:00 AM	3	43	7	0	53
8:15 AM	15	42	7	0	64
8:30 AM	8	55	11	0	74
8:45 AM	7	52	9	0	68
4:00 PM	12	54	12	0	78
4:15 PM	8	71	22	0	101
4:30 PM	5	42	16	0	63
4:45 PM	7	69	24	0	100
5:00 PM	3	69	15	0	87
5:15 PM	12	67	6	0	85
5:30 PM	7	58	13	0	78
5:45 PM	7	71	19	0	97
Total	145	825	188	0	1158
App %	12.52	71.24	16.23		
Total %	3.18	18.07	4.12		25.36

Cars Trucks Pedestrians Bikes





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Calculate Peak Hour for:

Intersection Corridor: NA

Turning Movement Count Data - 4357

Int ID: 4357

Community: UPPER ARLINGTON

Corridor: NA

Road 1: TREMONT RD

Road 3:

Road 2: ZOLLINGER RD

Road 4:

TMC Data

Display	Date	PHV	Peak Hour	Duration	TMC Owner
<input checked="" type="radio"/>	Tuesday, August 26, 2014	1354	5:00 PM	7:00 AM - 6:00 PM	morpc

|<< < > >>| 1-1 of 1 mm/dd/yyyy

Notes

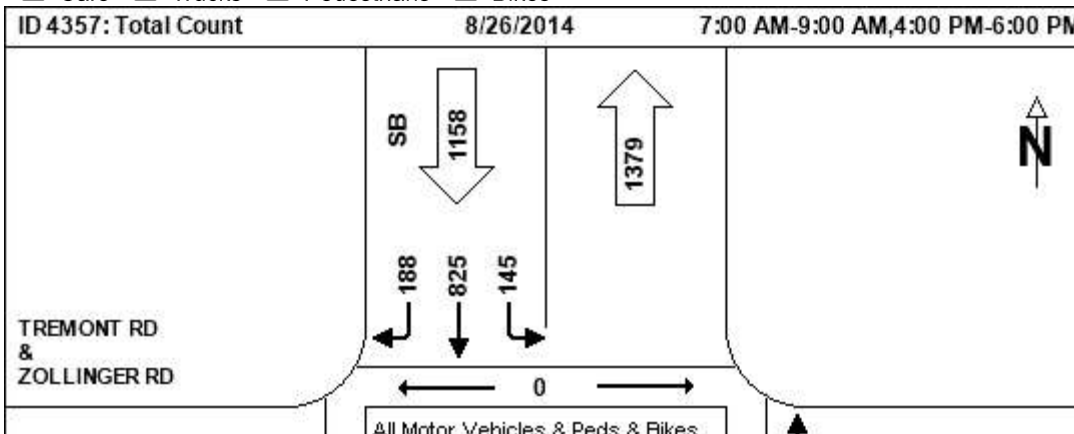
Note	Date

NB **EB** **SB** **WB**

Vehicles

Start Time	Left	Thru	Right	Ped	Total
7:00 AM	1	14	3	0	18
7:15 AM	2	14	5	0	21
7:30 AM	5	28	13	0	46
7:45 AM	15	55	9	0	79
8:00 AM	6	36	9	0	51
8:15 AM	4	23	7	0	34
8:30 AM	4	24	2	0	30
8:45 AM	6	17	11	0	34
4:00 PM	14	45	10	0	69
4:15 PM	18	48	12	0	78
4:30 PM	8	45	5	0	58
4:45 PM	9	62	10	0	81
5:00 PM	13	60	9	0	82
5:15 PM	16	85	12	0	113
5:30 PM	21	63	21	0	105
5:45 PM	24	53	5	0	82
Total	166	672	143	0	981
App %	16.92	68.50	14.58		
Total %	3.64	14.72	3.13		21.48

Cars Trucks Pedestrians Bikes





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Calculate Peak Hour for:

Intersection Corridor: NA

Turning Movement Count Data - 4373

Int ID: 4373
Community: UPPER ARLINGTON **Corridor:** NA
Road 1: NORTHWEST BLVD **Road 3:**
Road 2: ZOLLINGER RD **Road 4:**

TMC Data

Display	Date	PHV	Peak Hour	Duration	TMC Owner
<input checked="" type="radio"/>	Thursday, December 14, 2017	1593	5:00 PM	11:00 AM - 6:00 PM	morpc

|<< < > >>| 1-1 of 1 mm/dd/yyyy

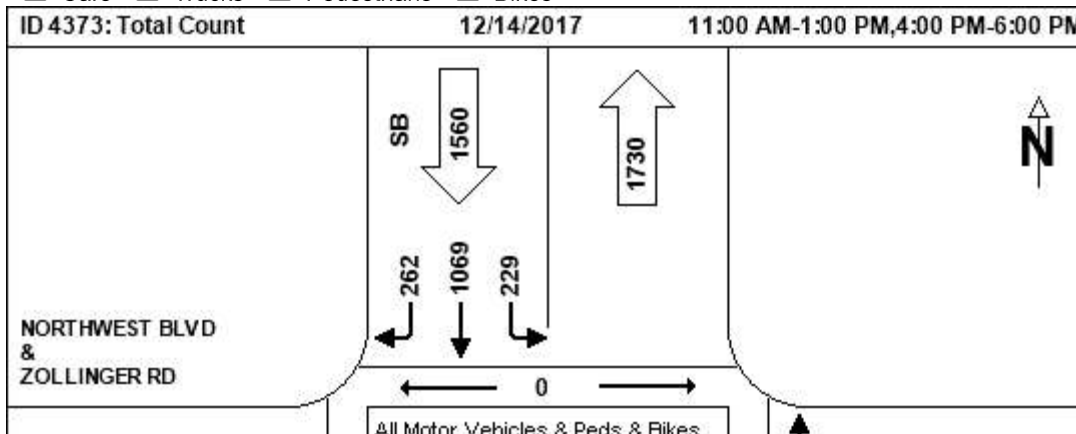
Notes		Date
Note	Date	

NB **EB** **SB** **WB**

Vehicles

Start Time	Left	Thru	Right	Ped	Total
11:00 AM	8	25	16	0	49
11:15 AM	6	23	22	0	51
11:30 AM	7	23	20	0	50
11:45 AM	12	26	21	0	59
12:00 PM	12	24	22	0	58
12:15 PM	11	18	15	0	44
12:30 PM	50	20	18	0	88
12:45 PM	11	19	22	0	52
4:00 PM	12	31	18	0	61
4:15 PM	13	24	16	0	53
4:30 PM	14	30	21	0	65
4:45 PM	5	30	26	0	61
5:00 PM	8	33	27	0	68
5:15 PM	17	36	27	0	80
5:30 PM	20	26	21	0	67
5:45 PM	11	36	25	0	72
Total	217	424	337	0	978
App %	22.19	43.35	34.46		
Total %	4.16	8.14	6.47		18.77

Cars Trucks Pedestrians Bikes





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Calculate Peak Hour for:

Intersection Corridor: NA

Turning Movement Count Data - 4373

Int ID: 4373
Community: UPPER ARLINGTON **Corridor:** NA
Road 1: NORTHWEST BLVD **Road 3:**
Road 2: ZOLLINGER RD **Road 4:**

TMC Data

Display	Date	PHV	Peak Hour	Duration	TMC Owner
<input checked="" type="radio"/>	Thursday, December 14, 2017	1593	5:00 PM	11:00 AM - 6:00 PM	morpc

|<< < > >>| 1-1 of 1 mm/dd/yyyy

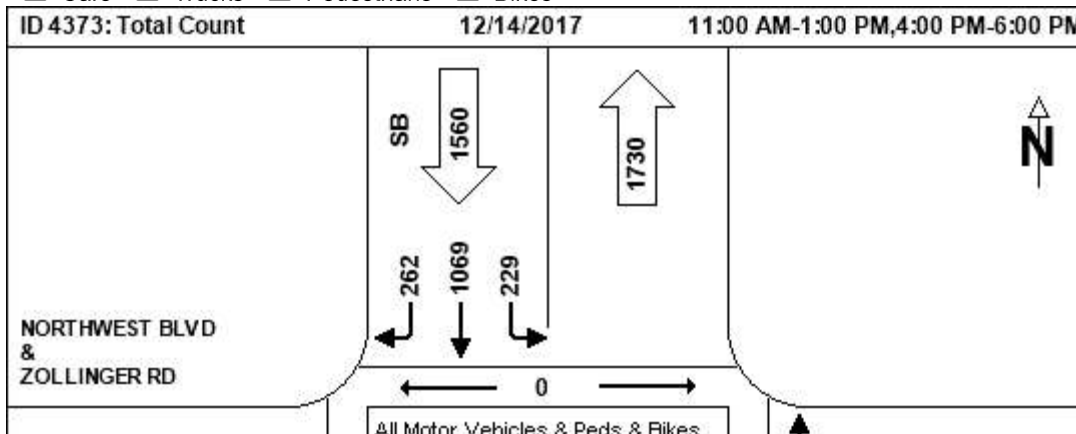
Notes		Date
Note		

NB **EB** **SB** **WB**

Vehicles

Start Time	Left	Thru	Right	Ped	Total
11:00 AM	18	53	8	0	79
11:15 AM	21	66	5	0	92
11:30 AM	21	67	2	0	90
11:45 AM	30	59	3	0	92
12:00 PM	23	67	7	0	97
12:15 PM	23	65	3	0	91
12:30 PM	21	45	5	0	71
12:45 PM	24	55	3	0	82
4:00 PM	18	81	2	0	101
4:15 PM	29	89	8	0	126
4:30 PM	31	98	4	0	133
4:45 PM	38	95	7	0	140
5:00 PM	39	107	10	0	156
5:15 PM	49	114	5	0	168
5:30 PM	35	104	8	0	147
5:45 PM	40	100	6	0	146
Total	460	1265	86	0	1811
App %	25.40	69.85	4.75		
Total %	8.83	24.28	1.65		34.75

Cars Trucks Pedestrians Bikes





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Calculate Peak Hour for:

Intersection Corridor: NA

Turning Movement Count Data - 4373

Int ID: 4373
Community: UPPER ARLINGTON
Road 1: NORTHWEST BLVD
Road 2: ZOLLINGER RD
Corridor: NA
Road 3:
Road 4:

TMC Data

Display	Date	PHV	Peak Hour	Duration	TMC Owner
<input checked="" type="radio"/>	Thursday, December 14, 2017	1593	5:00 PM	11:00 AM - 6:00 PM	morpc

|<< < > >>| 1-1 of 1 mm/dd/yyyy

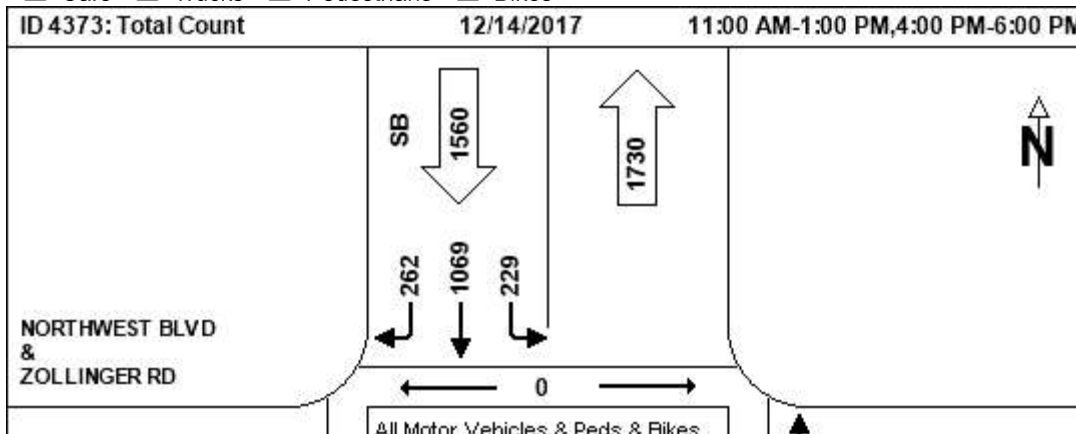
Notes		Date
Note	Date	

NB **EB** **SB** **WB**

Vehicles

Start Time	Left	Thru	Right	Ped	Total
11:00 AM	7	51	9	0	67
11:15 AM	11	67	15	0	93
11:30 AM	14	62	19	0	95
11:45 AM	13	61	13	0	87
12:00 PM	19	74	14	0	107
12:15 PM	11	59	20	0	90
12:30 PM	18	69	18	0	105
12:45 PM	14	62	12	0	88
4:00 PM	14	64	17	0	95
4:15 PM	17	67	17	0	101
4:30 PM	16	68	17	0	101
4:45 PM	18	85	24	0	127
5:00 PM	16	67	21	0	104
5:15 PM	7	51	13	0	71
5:30 PM	15	83	19	0	117
5:45 PM	19	79	14	0	112
Total	229	1069	262	0	1560
App %	14.68	68.53	16.79		
Total %	4.39	20.51	5.03		29.94

Cars Trucks Pedestrians Bikes





Search | Back | Cars |

Calculate Peak Hour for:

Intersection Corridor: NA

Turning Movement Count Data - 4373

Int ID: 4373
Community: UPPER ARLINGTON
Road 1: NORTHWEST BLVD
Road 2: ZOLLINGER RD
Corridor: NA
Road 3:
Road 4:

TMC Data

Display	Date	PHV	Peak Hour	Duration	TMC Owner
<input checked="" type="radio"/>	Thursday, December 14, 2017	1593	5:00 PM	11:00 AM - 6:00 PM	morpc

|<< < > >>| 1-1 of 1 mm/dd/yyyy

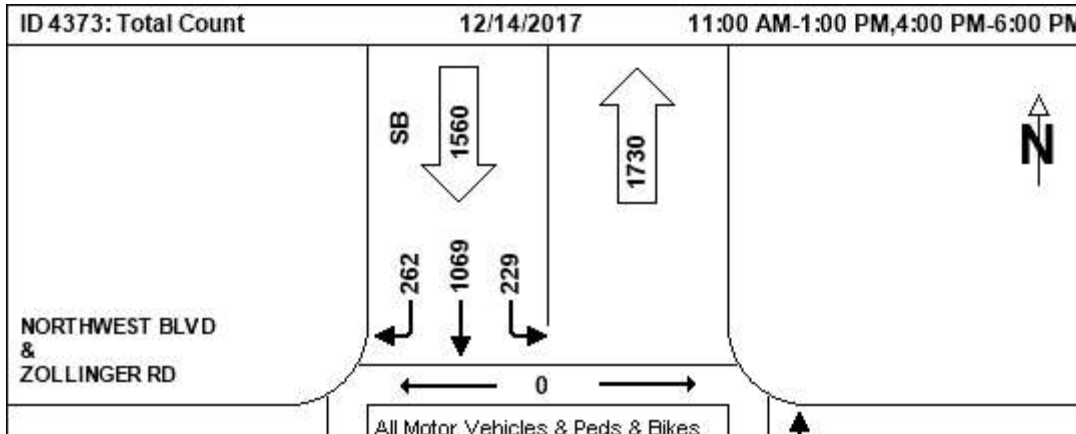
Notes		Date
Note	Date	

NB **EB** **SB** **WB**

Vehicles

Start Time	Left	Thru	Right	Ped	Total
11:00 AM	5	26	15	0	46
11:15 AM	11	29	14	0	54
11:30 AM	4	27	14	0	45
11:45 AM	4	20	15	0	39
12:00 PM	10	27	15	0	52
12:15 PM	5	18	12	0	35
12:30 PM	7	23	6	0	36
12:45 PM	4	27	14	0	45
4:00 PM	13	30	18	0	61
4:15 PM	4	33	18	0	55
4:30 PM	6	32	17	0	55
4:45 PM	2	32	20	0	54
5:00 PM	2	30	12	0	44
5:15 PM	11	58	21	0	90
5:30 PM	10	48	18	0	76
5:45 PM	12	44	19	0	75
Total	110	504	248	0	862
App %	12.76	58.47	28.77		
Total %	2.11	9.67	4.76		16.54

Cars Trucks Pedestrians Bikes



Growth Rate Calculations from Historic Count Data

$$\text{Growth Rate} = [(2020 \text{ Volume} / \text{Historic Volume}) - 1] / (2020 - \text{Historic Year})$$

<u>Tremont Road & Mildred Road (7-9 & 4-6 Combined)</u>		<u>Tremont Road & Zollinger Road (7-9 & 4-6 Combined)</u>	
2014 Count Data	3278	2014 Count Data	4566
2020 Count Data	1833	2020 Count Data	2302
Growth Rate	-7.35%	Growth Rate	-8.26%

<u>Northwest Boulevard & Zollinger Road (4-6)</u>	
2017 Count Data	2982
2020 Count Data	2097
Growth Rate	-9.89%

* In order to be conservative, a blanket growth rate of 0.50% was used.

Appendix C

Trip Generation



Scenario - 1

Scenario Name: AM Peak

User Group:

Dev. phase: 1

No. of Years to Project 0

Analyst Note:

Traffic :

Warning:

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method Rate/Equation	Entry Split%		Exit Split%		Total
						Entry	Exit	Entry	Exit	
221 - Multifamily Housing (Mid-Rise) Data Source: Trip Gen Manual, 10th Ed +	General Urban/Suburban	Dwelling Units	363	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Best Fit (LOG) $\ln(T) = 0.98\ln(X) - 0.98$	31	26%	90	74%	121
254 - Assisted Living Data Source: Trip Gen Manual, 10th Ed +	General Urban/Suburban	Beds	52	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Average 0.19	6	63%	4	37%	10
252 - Senior Adult Housing - Attached Data Source: Trip Gen Manual, 10th Ed +	General Urban/Suburban	Dwelling Units	52	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Best Fit (LIN) $T = 0.20(X) - 0.18$	4	35%	7	65%	11
932 - High-Turnover (Sit-Down) Restaurant Data Source: Trip Gen Manual, 10th Ed +	General Urban/Suburban	1000 Sq. Ft. GFA	6	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Average 9.94	33	55%	27	45%	60
495 - Recreational Community Center Data Source: Trip Gen Manual, 10th Ed +	General Urban/Suburban	1000 Sq. Ft. GFA	100	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Best Fit (LOG) $\ln(T) = 0.54\ln(X) + 2.73$	122	66%	63	34%	185
710 - General Office Building Data Source: Trip Gen Manual, 10th Ed +	General Urban/Suburban	1000 Sq. Ft. GFA	30	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Best Fit (LIN) $T = 0.94(X) + 26.49$	47	86%	8	14%	55

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

Land Use	Baseline Site Vehicle Mode Share		Baseline Site Vehicle Occupancy		Baseline Site Vehicle Directional Split	
	Entry (%)	Exit (%)	Entry	Exit	Entry (%)	Exit (%)
221 - Multifamily Housing (Mid-Rise)	100	100	1	1	26	74
254 - Assisted Living	100	100	1	1	63	37
252 - Senior Adult Housing - Attached	100	100	1	1	35	65
932 - High-Turnover (Sit-Down) Restaurant	100	100	1	1	55	45
495 - Recreational Community Center	100	100	1	1	66	34
710 - General Office Building	100	100	1	1	86	14

ESTIMATED BASELINE SITE PERSON TRIPS:

Land Use	Person Trips by Vehicle		Person Trips by Other Modes		Total Baseline Site Person Trips	
	Entry	Exit	Entry	Exit	Entry	Exit
221 - Multifamily Housing (Mid-Rise)	31	90	0	0	31	90
254 - Assisted Living	6	4	0	0	6	4
252 - Senior Adult Housing - Attached	4	7	0	0	4	7
932 - High-Turnover (Sit-Down) Restaurant	33	27	0	0	33	27
495 - Recreational Community Center	122	63	0	0	122	63
710 - General Office Building	47	8	0	0	47	8
		55	0	0	47	55

INTERNAL VEHICLE TRIP REDUCTION

LAND USE GROUP ASSIGNMENT:

Land Use	Land Use Group
221 - Multifamily Housing (Mid-Rise)	Residential

254 - Assisted Living	Residential
252 - Senior Adult Housing - Attached	Residential
932 - High-Turnover (Sit-Down) Restaurant	Restaurant
495 - Recreational Community Center	Cinema
710 - General Office Building	Office

BALANCED PERSON TRIPS:

221 - Multifamily Housing (Mid-Rise)				254 - Assisted Living			
Persons Exit	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Persons Entry
90	1	0	0	0	1	0	6
Persons Entry	PAF	UIPTC	Unconstrained Demand	Persons Entry	PAF	UIPTC	Persons Exit
31	1	0	0	0	1	0	4
221 - Multifamily Housing (Mid-Rise)				252 - Senior Adult Housing - Attached			
Persons Exit	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Persons Entry
90	1	0	0	0	1	0	4
Persons Entry	PAF	UIPTC	Unconstrained Demand	Persons Entry	PAF	UIPTC	Persons Exit
31	1	0	0	0	1	0	7
221 - Multifamily Housing (Mid-Rise)				932 - High-Turnover (Sit-Down) Restaurant			
Persons Exit	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Persons Entry
90	1	6.666666666666667	6	2	1	6.666666666666667	33
Persons Entry	PAF	UIPTC	Unconstrained Demand	Persons Entry	PAF	UIPTC	Persons Exit
31	1	1.666666666666667	1	0	1	1.3333333333333333	27
221 - Multifamily Housing (Mid-Rise)				495 - Recreational Community Center			
Persons Exit	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Persons Entry
90	1	0	0	0	1	0	122
Persons Entry	PAF	UIPTC	Unconstrained Demand	Persons Entry	PAF	UIPTC	Persons Exit
31	1	0	0	0	1	0	63
221 - Multifamily Housing (Mid-Rise)				710 - General Office Building			
Persons Exit	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Persons Entry
90	1	0.6666666666666666	1	0	1	1	47
Persons Entry	PAF	UIPTC	Unconstrained Demand	Persons Entry	PAF	UIPTC	Persons Exit
31	1	0	0	0	1	0.3333333333333333	8
254 - Assisted Living				252 - Senior Adult Housing - Attached			
Persons Exit	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Persons Entry
4	1	0	0	0	1	0	4
Persons Entry	PAF	UIPTC	Unconstrained Demand	Persons Entry	PAF	UIPTC	Persons Exit
6	1	0	0	0	1	0	7
254 - Assisted Living				932 - High-Turnover (Sit-Down) Restaurant			
Persons Exit	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Persons Entry
4	1	6.666666666666667	0	2	1	6.666666666666667	33
Persons Entry	PAF	UIPTC	Unconstrained Demand	Persons Entry	PAF	UIPTC	Persons Exit
6	1	1.666666666666667	0	0	1	1.3333333333333333	27

254 - Assisted Living									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Entry
4	1	0	0	0	0	1	0	0	122
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Exit
6	1	0	0	0	0	1	0	0	63
254 - Assisted Living									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Entry
4	1	0.6666666666666666	0	0	0	1	0	1	47
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Exit
6	1	0	0	0	0.3333333333333333	1	0	0	8
252 - Senior Adult Housing - Attached									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Entry
7	1	6.666666666666667	0	0	6.666666666666667	1	2	0	33
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Exit
4	1	1.6666666666666667	0	0	1.3333333333333333	1	0	0	27
252 - Senior Adult Housing - Attached									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Entry
7	1	0	0	0	0	1	0	0	122
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Exit
4	1	0	0	0	0	1	0	0	63
252 - Senior Adult Housing - Attached									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Entry
7	1	0.6666666666666666	0	0	0.6666666666666666	1	0	1	47
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Exit
4	1	0	0	0	0	1	0	0	63
932 - High-Turnover (Sit-Down) Restaurant									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Entry
27	1	0	0	0	0	1	0	0	122
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Exit
33	1	0	0	0	0.3333333333333333	1	0	0	63
932 - High-Turnover (Sit-Down) Restaurant									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Entry
27	1	0	0	0	0	1	0	0	122
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Exit
33	1	0	0	0	0	1	0	0	63
932 - High-Turnover (Sit-Down) Restaurant									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Entry
27	1	31	8	7	14	1	7	14	47
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Exit
33	1	23	8	5	63	1	5	63	8
495 - Recreational Community Center									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Entry
63	1	0	0	0	0	1	0	0	47
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	UIPTC	Persons Exit
63	1	0	0	0	0	1	0	0	47

Persons Entry PAF UIPTC Unconstrained Demand <<<<== BALANCED <<<<== UIPTC PAF Persons Exit
 122 1 0 0 0 0 1 8

INTERNAL PERSON TRIPS:

Internal Person Trips From	Entry	Exit	Total
221 - Multifamily Housing (Mid-Rise)			
254 - Assisted Living	0	0	0
252 - Senior Adult Housing - Attached	0	0	0
932 - High-Turnover (Sit-Down) Restaurant	0	2	3
495 - Recreational Community Center	0	0	0
710 - General Office Building	0	0	0
Total Internal Person Trips	0	2	2

254 - Assisted Living

Internal Person Trips From	Entry	Exit	Total
221 - Multifamily Housing (Mid-Rise)			
252 - Senior Adult Housing - Attached	0	0	0
932 - High-Turnover (Sit-Down) Restaurant	0	0	0
495 - Recreational Community Center	0	0	0
710 - General Office Building	0	0	0
Total Internal Person Trips	0	0	0

252 - Senior Adult Housing - Attached

Internal Person Trips From	Entry	Exit	Total
221 - Multifamily Housing (Mid-Rise)			
254 - Assisted Living	0	0	0
932 - High-Turnover (Sit-Down) Restaurant	0	0	1
495 - Recreational Community Center	0	0	0
710 - General Office Building	0	0	0
Total Internal Person Trips	0	0	0

932 - High-Turnover (Sit-Down) Restaurant

Internal Person Trips From	Entry	Exit	Total
221 - Multifamily Housing (Mid-Rise)			
254 - Assisted Living	2	0	3
252 - Senior Adult Housing - Attached	0	0	0
495 - Recreational Community Center	0	0	1
710 - General Office Building	5	7	11
Total Internal Person Trips	7	7	14

495 - Recreational Community Center

Internal Person Trips From	Entry	Exit	Total
221 - Multifamily Housing (Mid-Rise)			
254 - Assisted Living	0	0	0
252 - Senior Adult Housing - Attached	0	0	0
932 - High-Turnover (Sit-Down) Restaurant	0	0	0
710 - General Office Building	0	0	0
Total Internal Person Trips	0	0	0

710 - General Office Building

Internal Person Trips From	Entry	Exit	Total
221 - Multifamily Housing (Mid-Rise)			
254 - Assisted Living	0	0	0
252 - Senior Adult Housing - Attached	0	0	0
932 - High-Turnover (Sit-Down) Restaurant	7	5	11
495 - Recreational Community Center	0	0	0
Total Internal Person Trips	7	5	12

**INTERNAL VEHICLE TRIPS AND CAPTURE:
221 - Multifamily Housing (Mid-Rise)**

Total Internal Person Trips	0	2	2
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	0	2	2
Total External Vehicle Trips	31	88	119
Internal Vehicle Trip Capture	0%	2%	0%

254 - Assisted Living

Total Internal Person Trips	0	0	0
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	0	0	0
Total External Vehicle Trips	6	4	10
Internal Vehicle Trip Capture	0%	0%	0%

252 - Senior Adult Housing - Attached

Total Internal Person Trips	0	0	0
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	0	0	0
Total External Vehicle Trips	4	7	11
Internal Vehicle Trip Capture	0%	0%	0%

932 - High-Turnover (Sit-Down) Restaurant

Total Internal Person Trips	7	7	14
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	7	7	14
Total External Vehicle Trips	26	20	46
Internal Vehicle Trip Capture	21%	26%	0%

495 - Recreational Community Center

Total Internal Person Trips	0	0	0
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	0	0	0
Total External Vehicle Trips	122	63	185
Internal Vehicle Trip Capture	0%	0%	0%

710 - General Office Building

Total Internal Person Trips	7	5	12
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	7	5	12
Total External Vehicle Trips	40	3	43
Internal Vehicle Trip Capture	15%	65%	0%

PASS-BY VEHICLE TRIP REDUCTION

Land Use	External Vehicle Trips		Pass-by Vehicle Trips	
	Entry	Exit	Entry (%)	Exit (%)
221 - Multifamily Housing (Mid-Rise)	31	88	0.00%	0.00%
254 - Assisted Living	6	4	0.00%	0.00%
	0	0	0	0

252 - Senior Adult Housing - Attached	4	7	0.00%	0.00%	0	0
932 - High-Turnover (Sit-Down) Restaurant	26	20	0.00%	0.00%	0	0
495 - Recreational Community Center	122	63	0.00%	0.00%	0	0
710 - General Office Building	40	3	0.00%	0.00%	0	0

DIVERTED VEHICLE TRIP REDUCTION

Land Use	External Vehicle Trips		Diverted Vehicle Trip %		Diverted Vehicle Trips	
	Entry	Exit	Entry (%)	Exit (%)	Entry	Exit
221 - Multifamily Housing (Mid-Rise)	31	88	0.00%	0.00%	0	0
254 - Assisted Living	6	4	0.00%	0.00%	0	0
252 - Senior Adult Housing - Attached	4	7	0.00%	0.00%	0	0
932 - High-Turnover (Sit-Down) Restaurant	26	20	0.00%	0.00%	0	0
495 - Recreational Community Center	122	63	0.00%	0.00%	0	0
710 - General Office Building	40	3	0.00%	0.00%	0	0

EXTRA VEHICLE TRIP REDUCTION

Land Use	(External - (Pass-by + Diverted)) Vehicle Trips		Extra Vehicle Trip Reduction %		Extra Reduced Vehicle Trips	
	Entry	Exit	Entry (%)	Exit (%)	Entry	Exit
221 - Multifamily Housing (Mid-Rise)	31	88	0.00%	0.00%	0	0
254 - Assisted Living	6	4	0.00%	0.00%	0	0
252 - Senior Adult Housing - Attached	4	7	0.00%	0.00%	0	0
932 - High-Turnover (Sit-Down) Restaurant	26	20	0.00%	0.00%	0	0
495 - Recreational Community Center	122	63	0.00%	0.00%	0	0
710 - General Office Building	40	3	0.00%	0.00%	0	0

NEW VEHICLE TRIPS

Land Use	New Vehicle Trips		Total
	Entry	Exit	
221 - Multifamily Housing (Mid-Rise)	31	88	119
254 - Assisted Living	6	4	10
252 - Senior Adult Housing - Attached	4	7	11
932 - High-Turnover (Sit-Down) Restaurant	26	20	46
495 - Recreational Community Center	122	63	185
710 - General Office Building	40	3	43

RESULTS

Site Totals	Entry	Exit	Total
Vehicle Trips Before Reduction	243	199	442
Internal Vehicle Trips	14	14	28
External Vehicle Trips	229	185	414
Internal Vehicle Trip Capture	6%	7%	7%
Pass-by Vehicle Trips	0	0	0
Diverted Vehicle Trips	0	0	0
Extra Reduced Vehicle Trips	0	0	0
New Vehicle Trips	229	185	414

Scenario - 2

Scenario Name: PM Peak

User Group:

Dev. phase: 1

No. of Years to Project 0

Analyst Note:

Traffic :

Warning:

VEHICLE TRIPS BEFORE REDUCTION

Land Use & Data Source	Location	IV	Size	Time Period	Method Rate/Equation	Entry		Exit		Total
						Split%	Split%	Split%	Split%	
221 - Multifamily Housing (Mid-Rise) Data Source: Trip Gen Manual, 10th Ed +	General Urban/Suburban	Dwelling Units	363	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Best Fit (LOG) $\ln(T) = 0.96\ln(X) - 0.63$	93	60	93	60	153
254 - Assisted Living Data Source: Trip Gen Manual, 10th Ed +	General Urban/Suburban	Beds	52	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Average 0.26	5	8	5	8	13
252 - Senior Adult Housing - Attached Data Source: Trip Gen Manual, 10th Ed +	General Urban/Suburban	Dwelling Units	52	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Best Fit (LIN) $T = 0.24(X) + 2.26$	8	7	8	7	15
932 - High-Turnover (Sit-Down) Restaurant Data Source: Trip Gen Manual, 10th Ed +	General Urban/Suburban	1000 Sq. Ft. GFA	6	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Average 9.77	36	22	36	22	58
495 - Recreational Community Center Data Source: Trip Gen Manual, 10th Ed +	General Urban/Suburban	1000 Sq. Ft. GFA	100	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Best Fit (LOG) $\ln(T) = 0.76\ln(X) + 2.00$	115	130	115	130	245
710 - General Office Building Data Source: Trip Gen Manual, 10th Ed +	General Urban/Suburban	1000 Sq. Ft. GFA	30	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Best Fit (LOG) $\ln(T) = 0.95\ln(X) + 0.36$	6	30	6	30	36

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

Land Use	Baseline Site Vehicle Mode Share		Baseline Site Vehicle Occupancy		Baseline Site Vehicle Directional Split	
	Entry (%)	Exit (%)	Entry	Exit	Entry (%)	Exit (%)
221 - Multifamily Housing (Mid-Rise)	100	100	1	1	61	39
254 - Assisted Living	100	100	1	1	38	62
252 - Senior Adult Housing - Attached	100	100	1	1	55	45
932 - High-Turnover (Sit-Down) Restaurant	100	100	1	1	62	38
495 - Recreational Community Center	100	100	1	1	47	53
710 - General Office Building	100	100	1	1	16	84

ESTIMATED BASELINE SITE PERSON TRIPS:

Land Use	Person Trips by Vehicle		Person Trips by Other Modes		Total Baseline Site Person Trips	
	Entry	Exit	Entry	Exit	Entry	Exit
221 - Multifamily Housing (Mid-Rise)	93	60	0	0	93	60
254 - Assisted Living	5	8	0	0	5	8
252 - Senior Adult Housing - Attached	8	7	0	0	8	7
932 - High-Turnover (Sit-Down) Restaurant	36	22	0	0	36	22
495 - Recreational Community Center	115	130	0	0	115	130
710 - General Office Building	6	30	0	0	6	30

INTERNAL VEHICLE TRIP REDUCTION

LAND USE GROUP ASSIGNMENT:

Land Use	Land Use Group
221 - Multifamily Housing (Mid-Rise)	Residential

254 - Assisted Living	Residential
252 - Senior Adult Housing - Attached	Residential
932 - High-Turnover (Sit-Down) Restaurant	Restaurant
495 - Recreational Community Center	Cinema
710 - General Office Building	Office

BALANCED PERSON TRIPS:

221 - Multifamily Housing (Mid-Rise)		254 - Assisted Living					
Persons Exit	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Unconstrained Demand
60	1	0	0	0	1	0	0
Persons Entry	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Unconstrained Demand
93	1	0	0	0	1	0	0
221 - Multifamily Housing (Mid-Rise)		252 - Senior Adult Housing - Attached					
Persons Exit	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Unconstrained Demand
60	1	0	0	0	1	0	0
Persons Entry	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Unconstrained Demand
93	1	0	0	0	1	0	0
221 - Multifamily Housing (Mid-Rise)		932 - High-Turnover (Sit-Down) Restaurant					
Persons Exit	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Unconstrained Demand
60	1	7	4	2	1	4.666666666666667	2
Persons Entry	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Unconstrained Demand
93	1	5.333333333333333	5	1	1	6	1
221 - Multifamily Housing (Mid-Rise)		495 - Recreational Community Center					
Persons Exit	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Unconstrained Demand
60	1	0	0	0	1	0	0
Persons Entry	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Unconstrained Demand
93	1	1.333333333333333	1	3	1	2.666666666666667	3
221 - Multifamily Housing (Mid-Rise)		710 - General Office Building					
Persons Exit	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Unconstrained Demand
60	1	1.333333333333333	1	1	1	19	1
Persons Entry	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Unconstrained Demand
93	1	1.333333333333333	1	0	1	0.666666666666667	0
254 - Assisted Living		252 - Senior Adult Housing - Attached					
Persons Exit	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Unconstrained Demand
8	1	0	0	0	1	0	0
Persons Entry	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Unconstrained Demand
5	1	0	0	0	1	0	0
254 - Assisted Living		932 - High-Turnover (Sit-Down) Restaurant					
Persons Exit	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Unconstrained Demand
8	1	7	1	2	1	4.666666666666667	2
Persons Entry	PAF	UIPTC	Unconstrained Demand	Persons Exit	PAF	UIPTC	Unconstrained Demand
5	1	5.333333333333333	0	1	1	6	1

254 - Assisted Living									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	Persons Entry	495 - Recreational Community Center
8	1	0	0	0	0	1	0	115	PAF
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	Persons Exit	495 - Recreational Community Center
5	1	1.3333333333333333	0	0	2.6666666666666665	1	3	130	PAF
254 - Assisted Living									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	Persons Entry	710 - General Office Building
8	1	1.3333333333333333	0	0	19	1	1	6	PAF
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	Persons Exit	710 - General Office Building
5	1	1.3333333333333333	0	0	0.6666666666666666	1	0	30	PAF
252 - Senior Adult Housing - Attached									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	Persons Entry	932 - High-Turnover (Sit-Down) Restaurant
7	1	7	0	0	4.666666666666667	1	2	36	PAF
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	Persons Exit	932 - High-Turnover (Sit-Down) Restaurant
8	1	5.333333333333333	0	0	6	1	1	22	PAF
252 - Senior Adult Housing - Attached									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	Persons Entry	495 - Recreational Community Center
7	1	0	0	0	0	1	0	115	PAF
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	Persons Exit	495 - Recreational Community Center
8	1	1.3333333333333333	0	0	2.6666666666666665	1	3	130	PAF
252 - Senior Adult Housing - Attached									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	Persons Entry	710 - General Office Building
7	1	1.3333333333333333	0	0	19	1	1	6	PAF
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	Persons Exit	710 - General Office Building
8	1	1.3333333333333333	0	0	0.6666666666666666	1	0	30	PAF
932 - High-Turnover (Sit-Down) Restaurant									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	Persons Entry	495 - Recreational Community Center
22	1	8	2	2	32	1	37	115	PAF
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	Persons Exit	495 - Recreational Community Center
36	1	3	1	1	31	1	40	130	PAF
932 - High-Turnover (Sit-Down) Restaurant									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	Persons Entry	710 - General Office Building
22	1	3	1	1	30	1	2	6	PAF
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	Persons Exit	710 - General Office Building
36	1	2	1	1	4	1	1	30	PAF
495 - Recreational Community Center									
Persons Exit	PAF	UIPTC	Unconstrained Demand	====>>> BALANCED ==>>>	UIPTC	PAF	Unconstrained Demand	Persons Entry	710 - General Office Building
130	1	2	3	0	6	1	0	6	PAF
Persons Entry	PAF	UIPTC	Unconstrained Demand	<<<=== BALANCED <<<===	UIPTC	PAF	Unconstrained Demand	Persons Exit	710 - General Office Building
130	1	2	3	0	6	1	0	6	PAF

Persons Entry PAF UIPTC Unconstrained Demand <<<<== BALANCED <<<<== UIPTC PAF Persons Exit
 115 1 1 1 0 0 1 30

INTERNAL PERSON TRIPS:

221 - Multifamily Housing (Mid-Rise)

Internal Person Trips From	Entry	Exit	Total
254 - Assisted Living	0	0	0
252 - Senior Adult Housing - Attached	0	0	0
932 - High-Turnover (Sit-Down) Restaurant	1	2	3
495 - Recreational Community Center	1	0	1
710 - General Office Building	0	1	1
Total Internal Person Trips	2	3	5

254 - Assisted Living

Internal Person Trips From	Entry	Exit	Total
221 - Multifamily Housing (Mid-Rise)	0	0	0
252 - Senior Adult Housing - Attached	0	0	0
932 - High-Turnover (Sit-Down) Restaurant	0	1	1
495 - Recreational Community Center	0	0	0
710 - General Office Building	0	0	0
Total Internal Person Trips	0	1	1

252 - Senior Adult Housing - Attached

Internal Person Trips From	Entry	Exit	Total
221 - Multifamily Housing (Mid-Rise)	0	0	0
254 - Assisted Living	0	0	0
932 - High-Turnover (Sit-Down) Restaurant	0	0	0
495 - Recreational Community Center	0	0	0
710 - General Office Building	0	0	0
Total Internal Person Trips	0	0	0

932 - High-Turnover (Sit-Down) Restaurant

Internal Person Trips From	Entry	Exit	Total
221 - Multifamily Housing (Mid-Rise)	2	1	3
254 - Assisted Living	1	0	1
252 - Senior Adult Housing - Attached	0	0	0
495 - Recreational Community Center	1	2	3
710 - General Office Building	1	1	2
Total Internal Person Trips	5	4	9

495 - Recreational Community Center

Internal Person Trips From	Entry	Exit	Total
221 - Multifamily Housing (Mid-Rise)	0	1	1
254 - Assisted Living	0	0	0
252 - Senior Adult Housing - Attached	0	0	0
932 - High-Turnover (Sit-Down) Restaurant	2	1	3
710 - General Office Building	0	0	0
Total Internal Person Trips	2	2	4

710 - General Office Building

Internal Person Trips From	Entry	Exit	Total
221 - Multifamily Housing (Mid-Rise)	1	0	1
254 - Assisted Living	0	0	0
252 - Senior Adult Housing - Attached	0	0	0
932 - High-Turnover (Sit-Down) Restaurant	1	1	2
495 - Recreational Community Center	0	0	0
Total Internal Person Trips	2	1	3

**INTERNAL VEHICLE TRIPS AND CAPTURE:
221 - Multifamily Housing (Mid-Rise)**

Total Internal Person Trips	2	3	5
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	2	3	5
Total External Vehicle Trips	91	57	148
Internal Vehicle Trip Capture	2%	5%	0%

254 - Assisted Living

Total Internal Person Trips	0	1	1
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	0	1	1
Total External Vehicle Trips	5	7	12
Internal Vehicle Trip Capture	0%	12%	0%

252 - Senior Adult Housing - Attached

Total Internal Person Trips	0	0	0
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	0	0	0
Total External Vehicle Trips	8	7	15
Internal Vehicle Trip Capture	0%	0%	0%

932 - High-Turnover (Sit-Down) Restaurant

Total Internal Person Trips	5	4	9
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	5	4	9
Total External Vehicle Trips	31	18	49
Internal Vehicle Trip Capture	14%	18%	0%

495 - Recreational Community Center

Total Internal Person Trips	2	2	4
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	2	2	4
Total External Vehicle Trips	113	128	241
Internal Vehicle Trip Capture	2%	2%	0%

710 - General Office Building

Total Internal Person Trips	2	1	3
Vehicle Mode Share	100%	100%	-
Vehicle Occupancy	1.00	1.00	-
Total Vehicle Internal Trips	2	1	3
Total External Vehicle Trips	4	29	33
Internal Vehicle Trip Capture	34%	3%	0%

PASS-BY VEHICLE TRIP REDUCTION

Land Use	External Vehicle Trips		Pass-by Vehicle Trips	
	Entry	Exit	Entry (%)	Exit (%)
221 - Multifamily Housing (Mid-Rise)	91	57	0.00%	0.00%
254 - Assisted Living	5	7	0.00%	0.00%
			0	0
			0	0

252 - Senior Adult Housing - Attached	8	7	0.00%	0.00%	0	0
932 - High-Turnover (Sit-Down) Restaurant	31	18	43.00%	43.00%	13	8
495 - Recreational Community Center	113	128	0.00%	0.00%	0	0
710 - General Office Building	4	29	0.00%	0.00%	0	0

DIVERTED VEHICLE TRIP REDUCTION

Land Use	External Vehicle Trips		Diverted Vehicle Trip %		Diverted Vehicle Trips	
	Entry	Exit	Entry (%)	Exit (%)	Entry	Exit
221 - Multifamily Housing (Mid-Rise)	91	57	0.00%	0.00%	0	0
254 - Assisted Living	5	7	0.00%	0.00%	0	0
252 - Senior Adult Housing - Attached	8	7	0.00%	0.00%	0	0
932 - High-Turnover (Sit-Down) Restaurant	31	18	0.00%	0.00%	0	0
495 - Recreational Community Center	113	128	0.00%	0.00%	0	0
710 - General Office Building	4	29	0.00%	0.00%	0	0

EXTRA VEHICLE TRIP REDUCTION

Land Use	(External - (Pass-by + Diverted)) Vehicle Trips		Extra Vehicle Trip Reduction %		Extra Reduced Vehicle Trips	
	Entry	Exit	Entry (%)	Exit (%)	Entry	Exit
221 - Multifamily Housing (Mid-Rise)	91	57	0.00%	0.00%	0	0
254 - Assisted Living	5	7	0.00%	0.00%	0	0
252 - Senior Adult Housing - Attached	8	7	0.00%	0.00%	0	0
932 - High-Turnover (Sit-Down) Restaurant	18	10	0.00%	0.00%	0	0
495 - Recreational Community Center	113	128	0.00%	0.00%	0	0
710 - General Office Building	4	29	0.00%	0.00%	0	0

NEW VEHICLE TRIPS

Land Use	New Vehicle Trips		Total
	Entry	Exit	
221 - Multifamily Housing (Mid-Rise)	91	57	148
254 - Assisted Living	5	7	12
252 - Senior Adult Housing - Attached	8	7	15
932 - High-Turnover (Sit-Down) Restaurant	18	10	28
495 - Recreational Community Center	113	128	241
710 - General Office Building	4	29	33

RESULTS

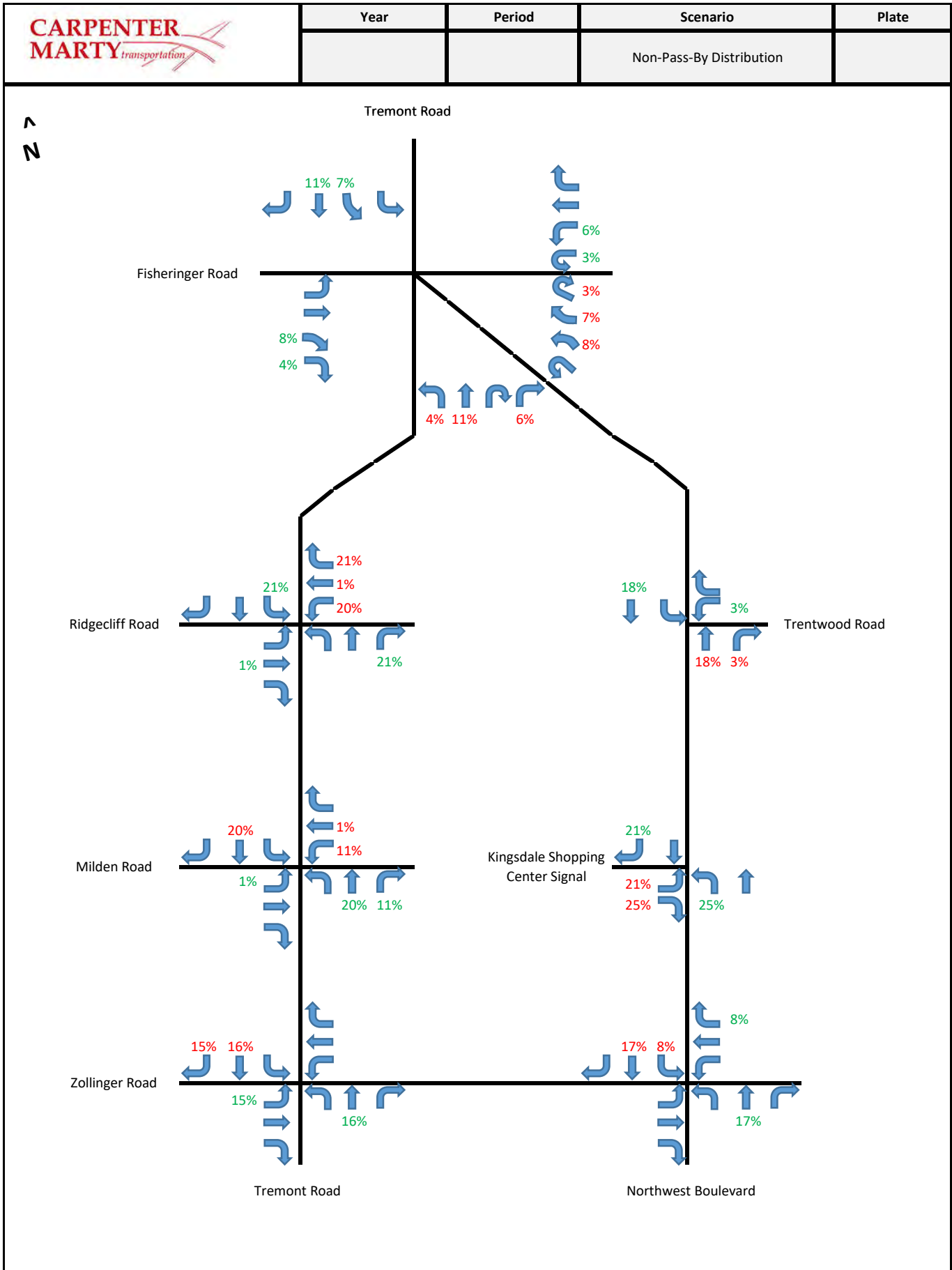
Site Totals	Entry	Exit	Total
Vehicle Trips Before Reduction	263	257	520
Internal Vehicle Trips	11	11	22
External Vehicle Trips	252	246	498
Internal Vehicle Trip Capture	4%	4%	4%
Pass-by Vehicle Trips	13	8	21
Diverted Vehicle Trips	0	0	0
Extra Reduced Vehicle Trips	0	0	0
New Vehicle Trips	239	238	477

Appendix D


Volume Calculations

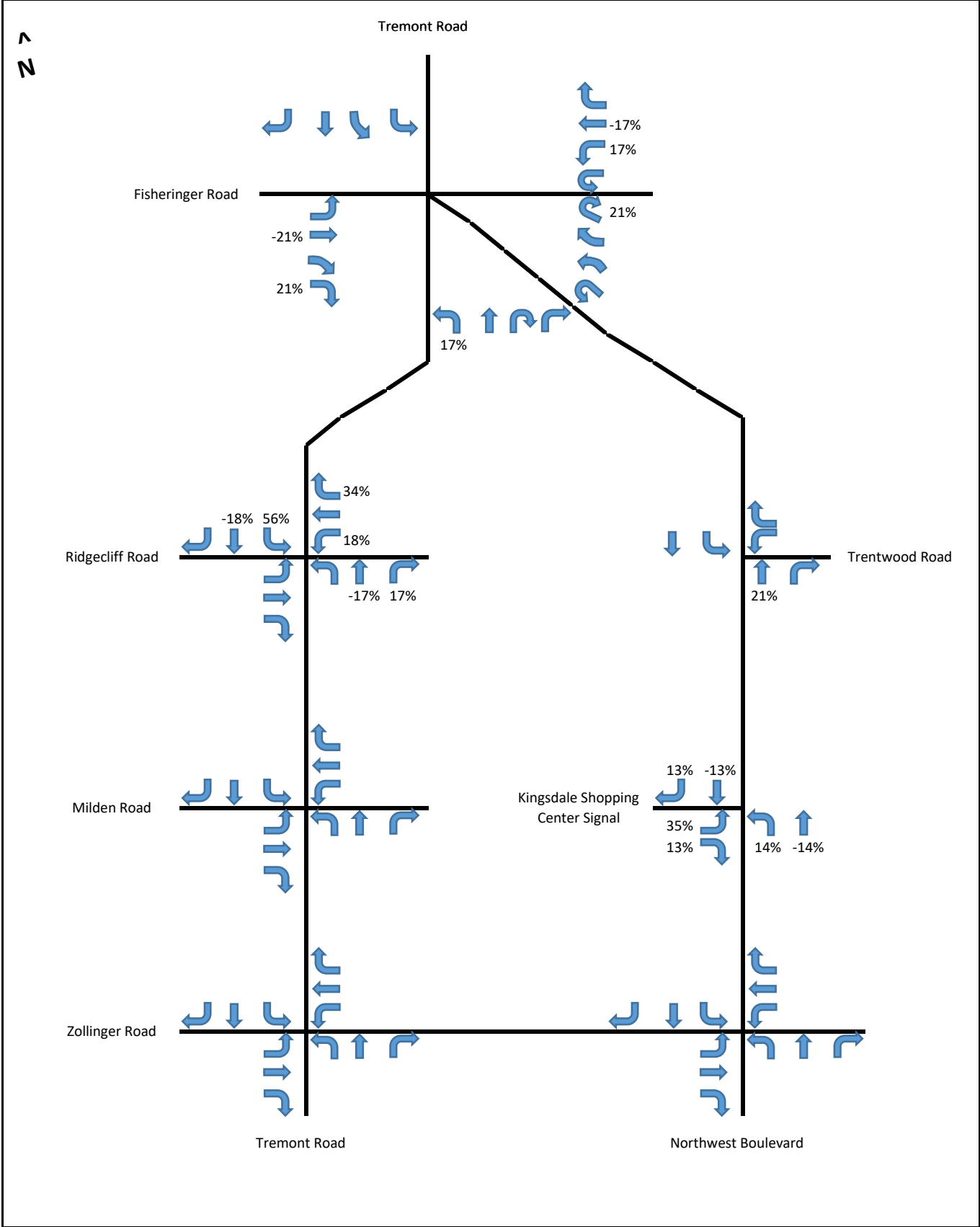


Kingsdale Expansion TIS
Traffic Volume Calculations



Kingsdale Expansion TIS
Traffic Volume Calculations

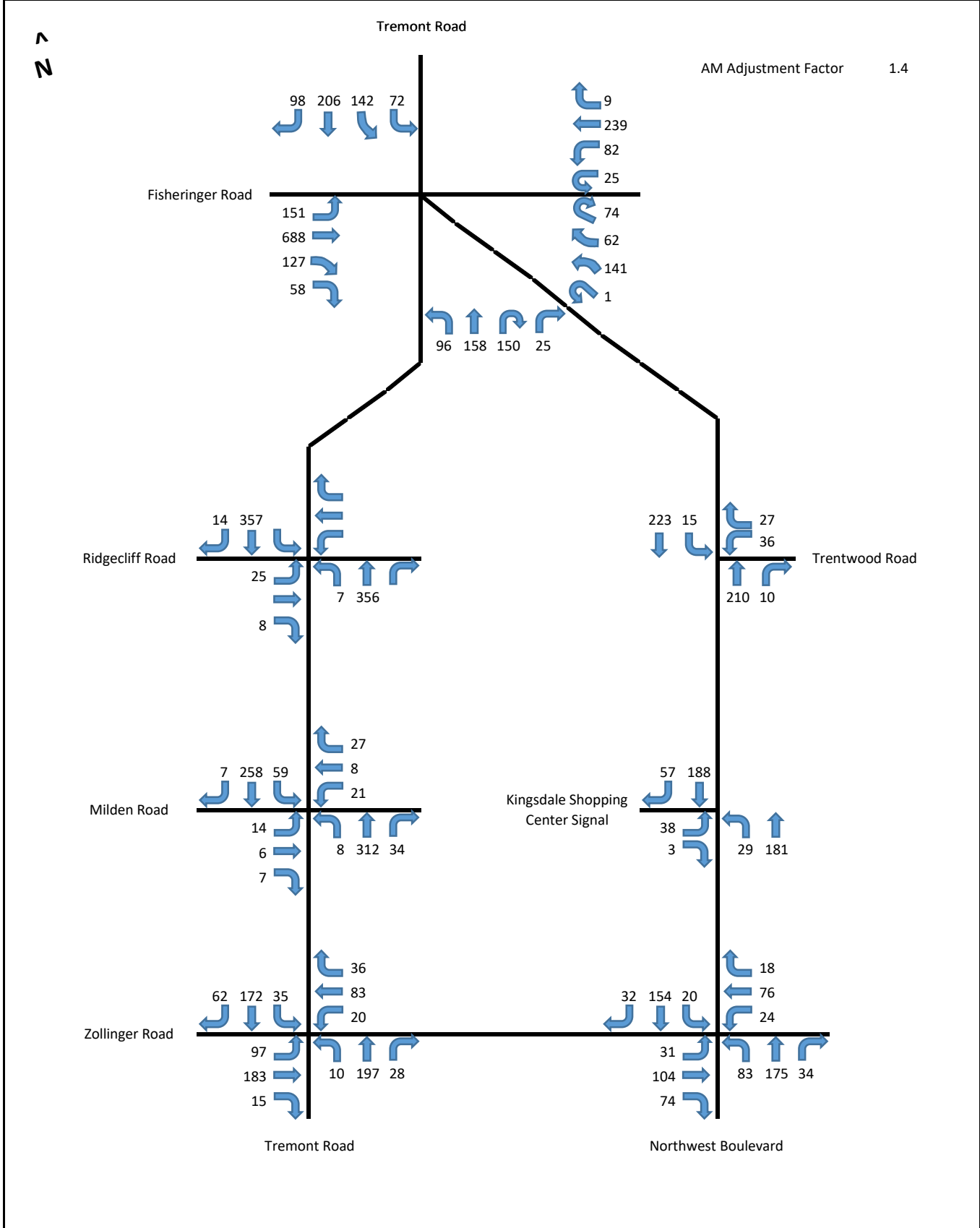
	Year	Period	Scenario	Plate
			Pass-By Distribution	



Kingsdale Expansion TIS Traffic Volume Calculations



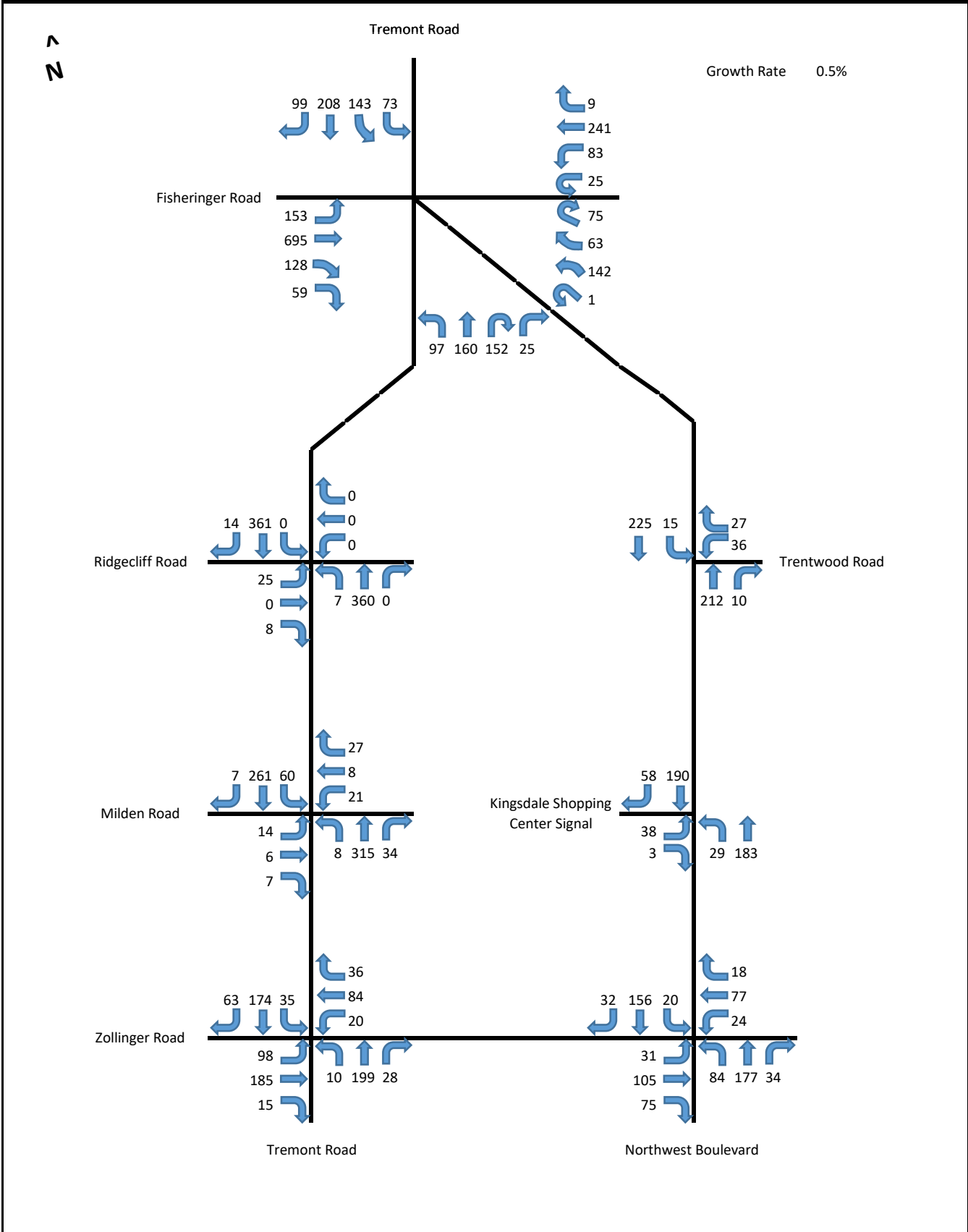
Year	Period	Scenario	Plate
2020	AM	Count Adjusted	



Kingsdale Expansion TIS
Traffic Volume Calculations



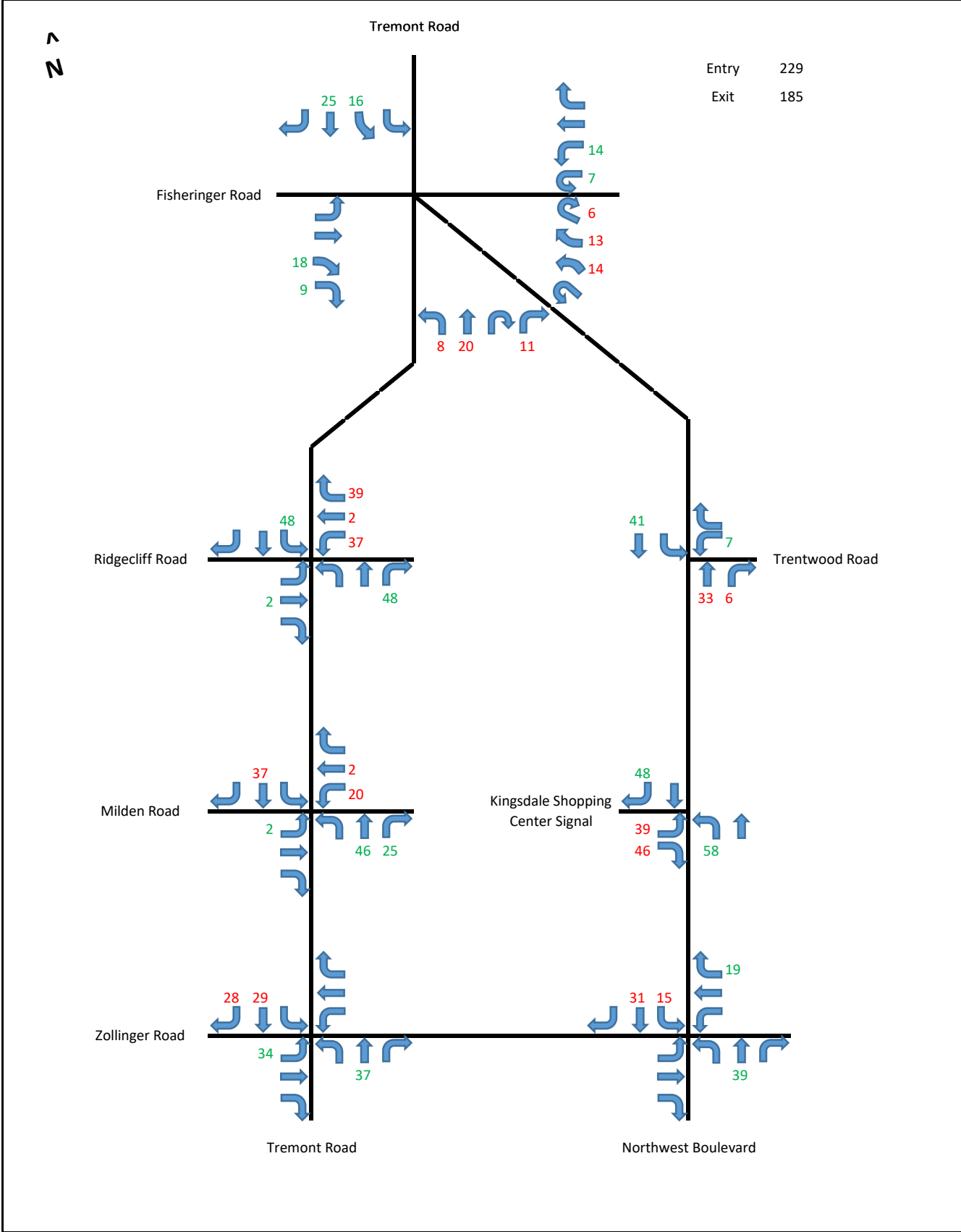
Year	Period	Scenario	Plate
2022	AM	No Build	A1



Kingsdale Expansion TIS
Traffic Volume Calculations



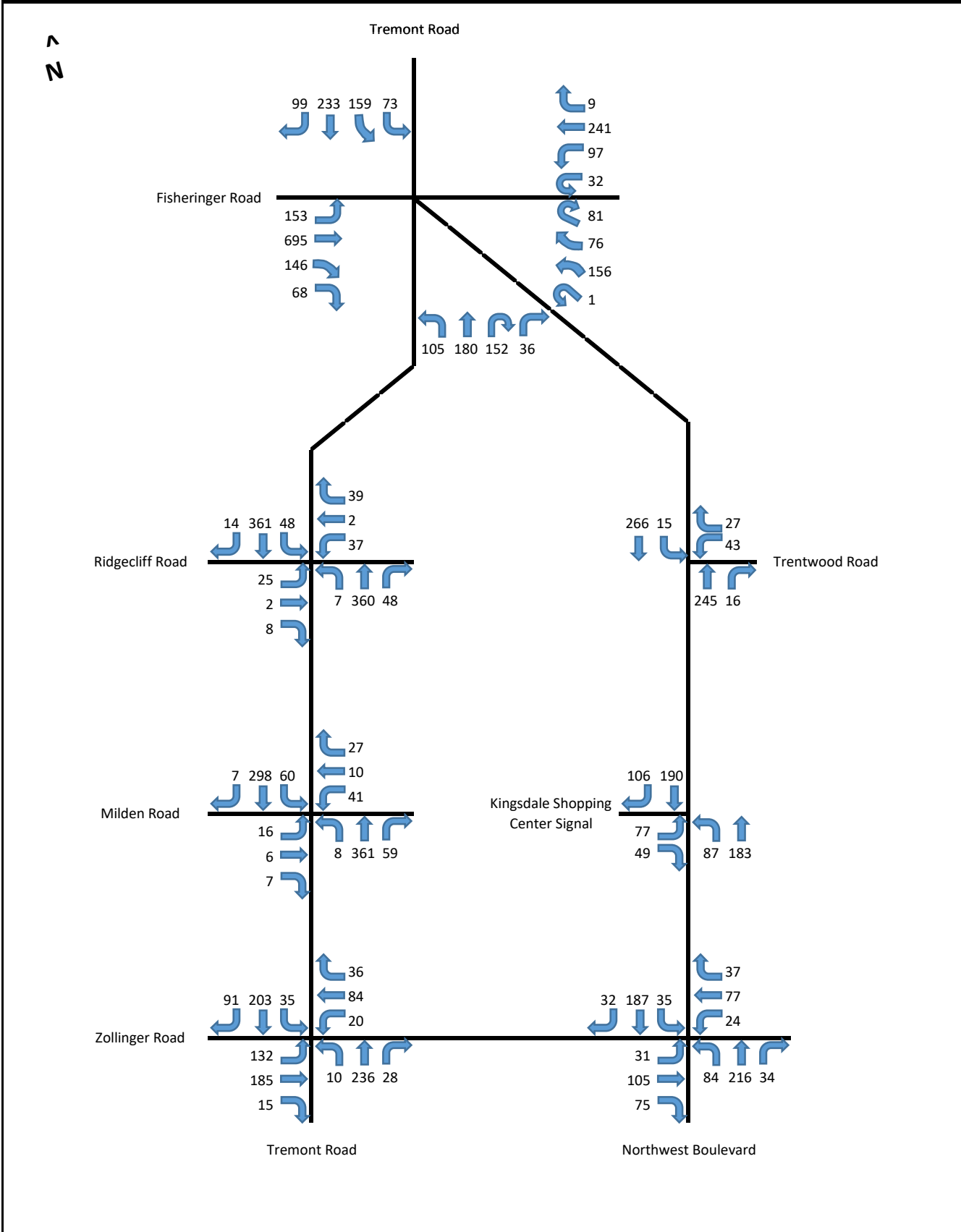
Year	Period	Scenario	Plate
	AM	Non-Pass-By Traffic	B1



Kingsdale Expansion TIS
Traffic Volume Calculations



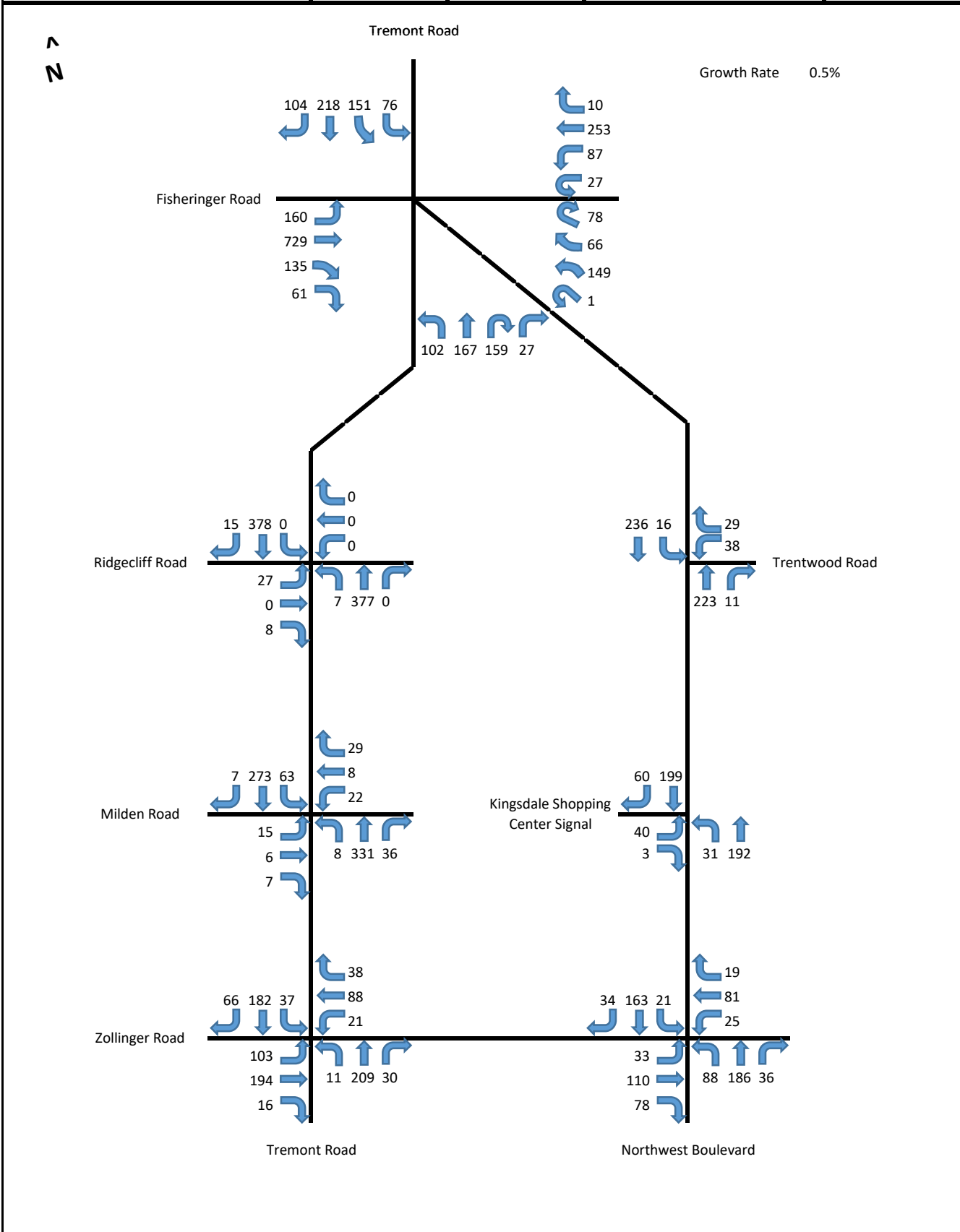
Year	Period	Scenario	Plate
2022	AM	Build	C1 = A1 + B1



Kingsdale Expansion TIS
Traffic Volume Calculations



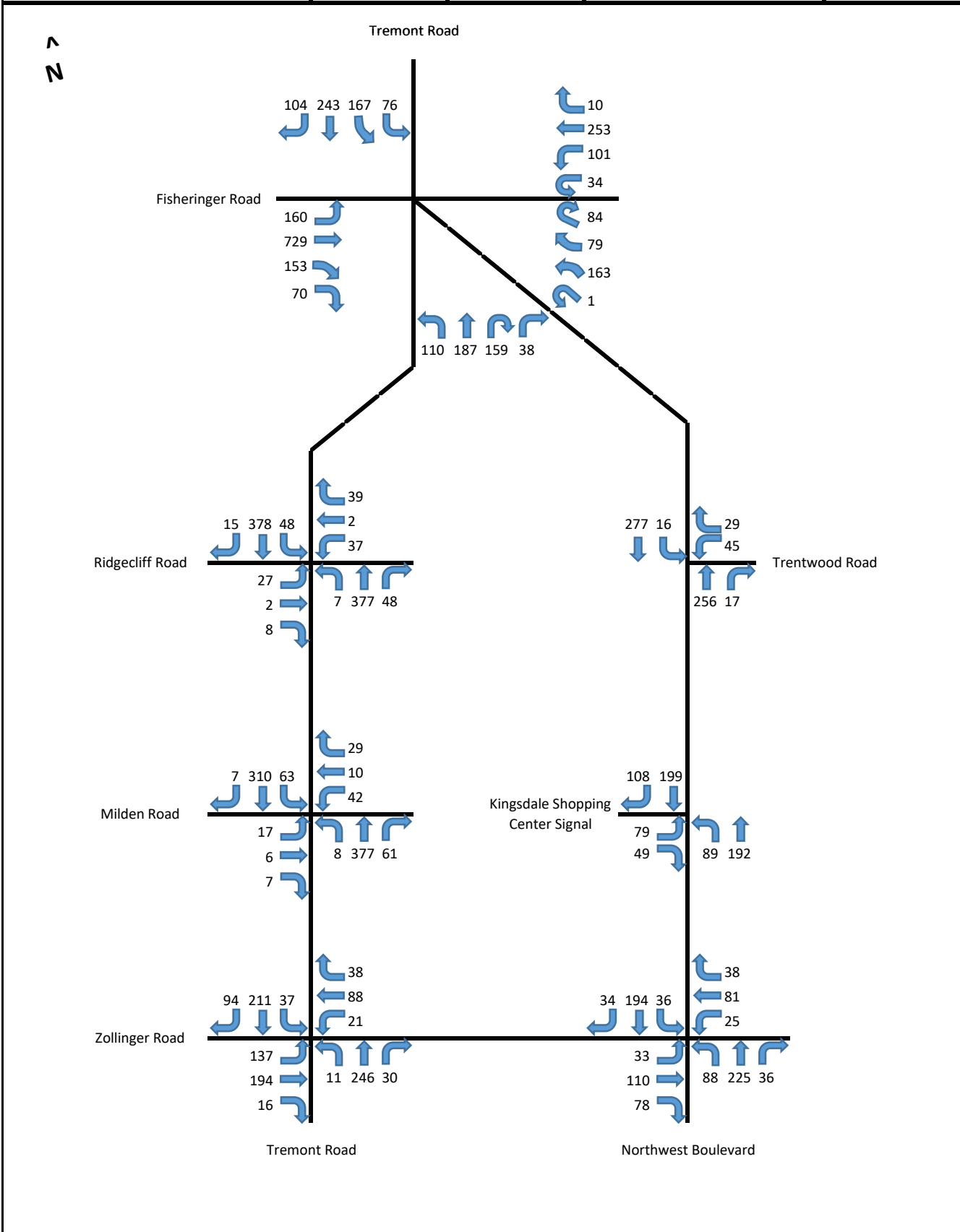
Year	Period	Scenario	Plate
2032	AM	No Build	D1



Kingsdale Expansion TIS
Traffic Volume Calculations



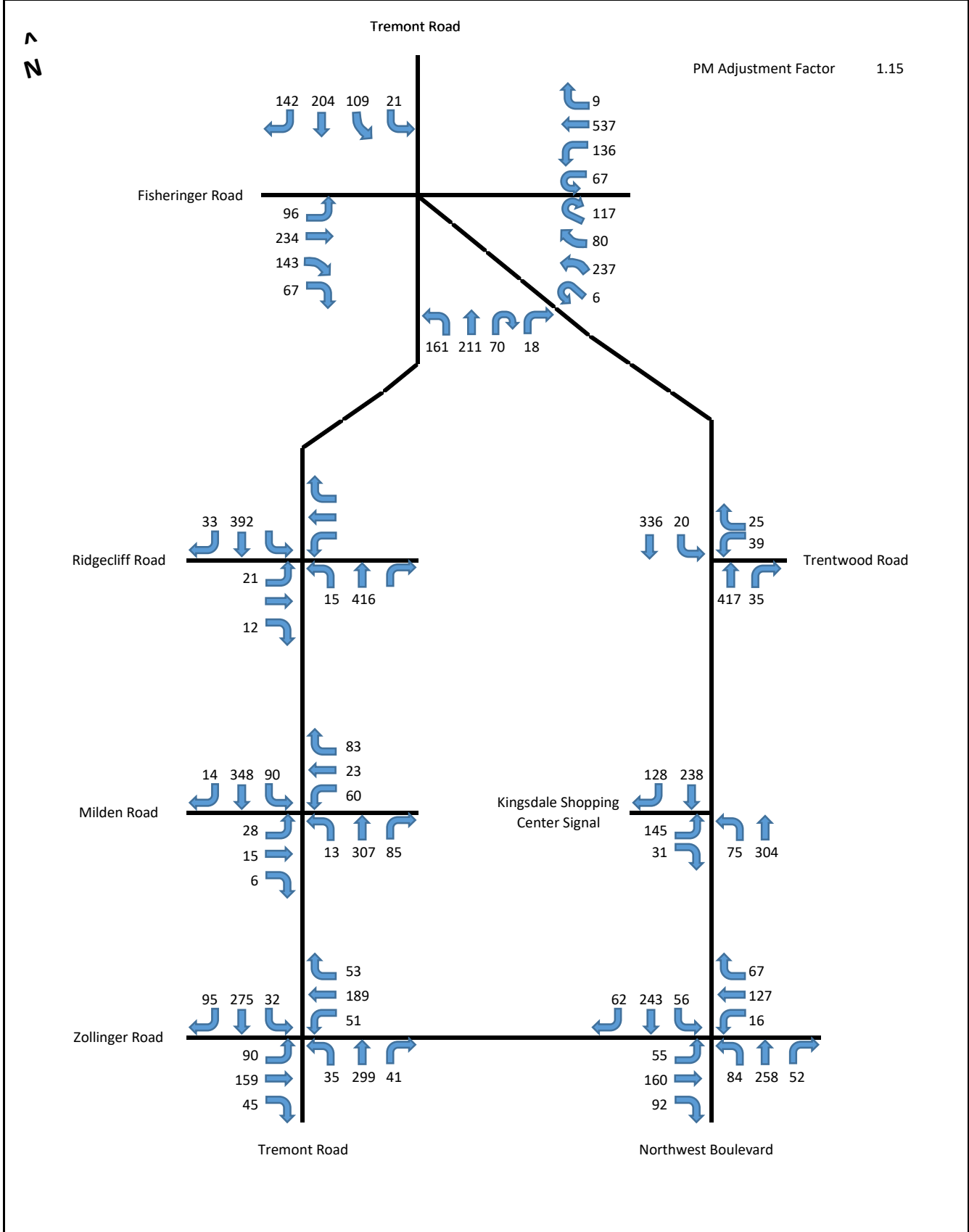
Year	Period	Scenario	Plate
2032	AM	Build	E1 = B1 + D1



Kingsdale Expansion TIS
Traffic Volume Calculations



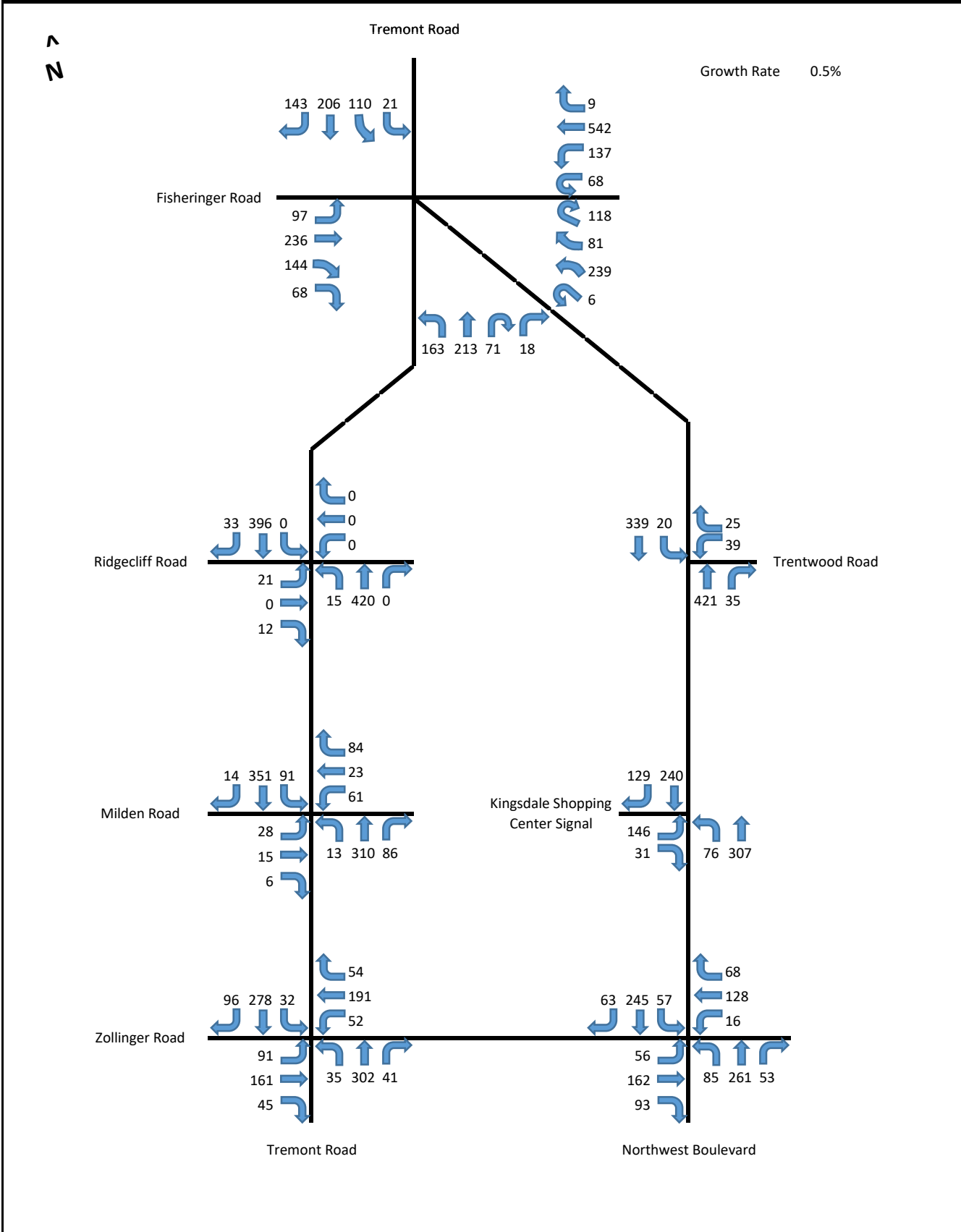
Year	Period	Scenario	Plate
2020	PM	Count Adjusted	



Kingsdale Expansion TIS
Traffic Volume Calculations



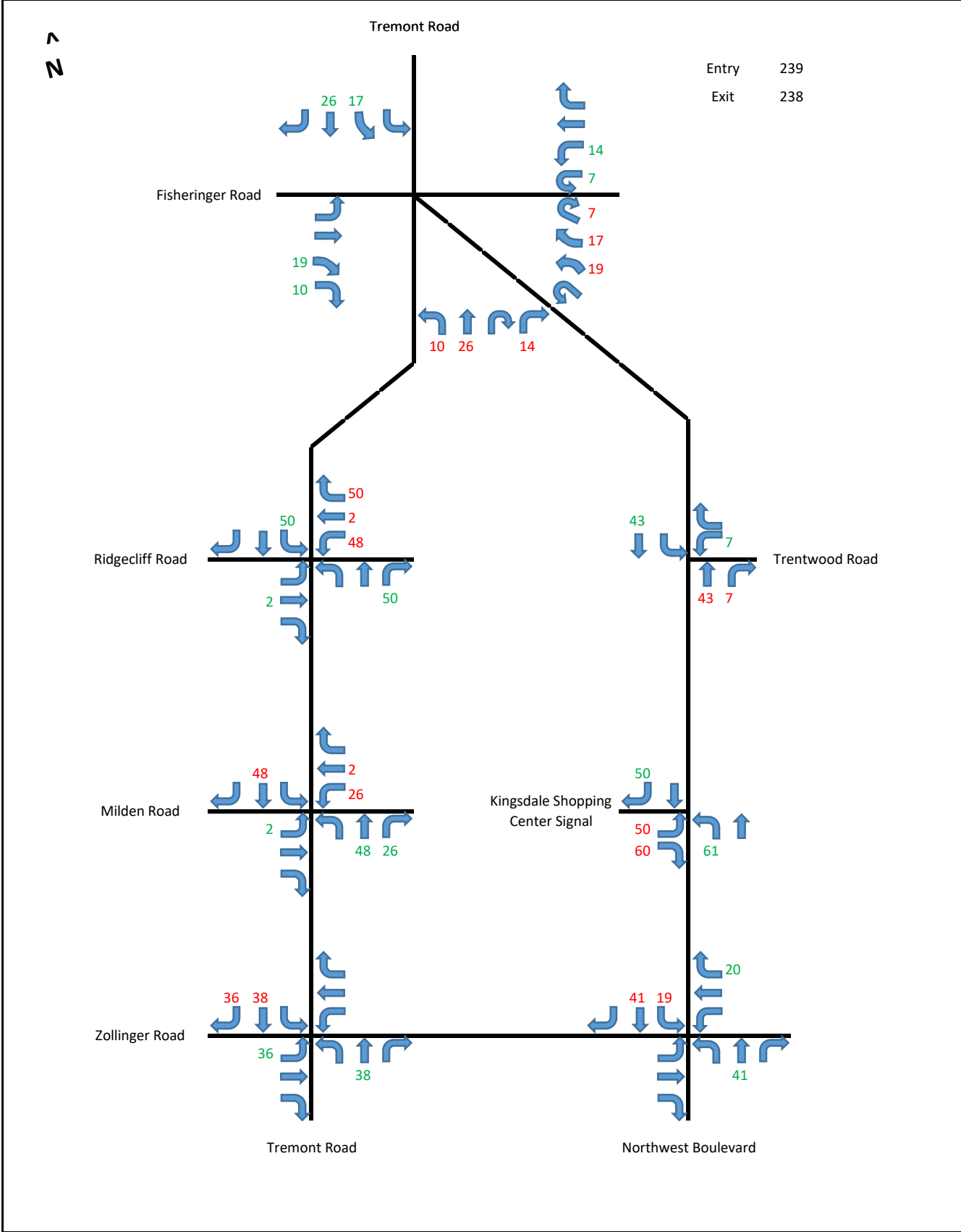
Year	Period	Scenario	Plate
2022	PM	No Build	A2



Kingsdale Expansion TIS
Traffic Volume Calculations



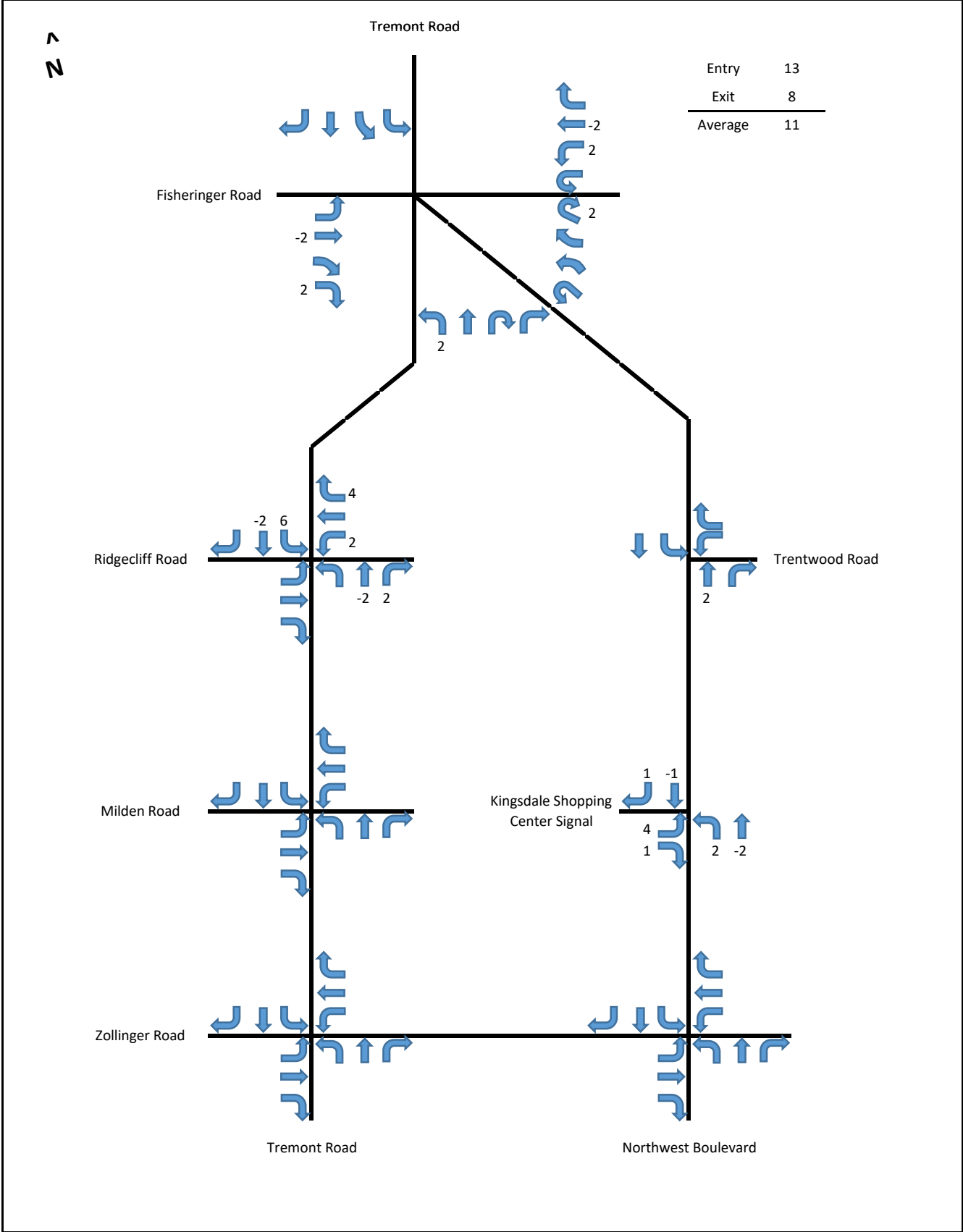
Year	Period	Scenario	Plate
	PM	Non-Pass-By Traffic	B2



Kingsdale Expansion TIS
Traffic Volume Calculations



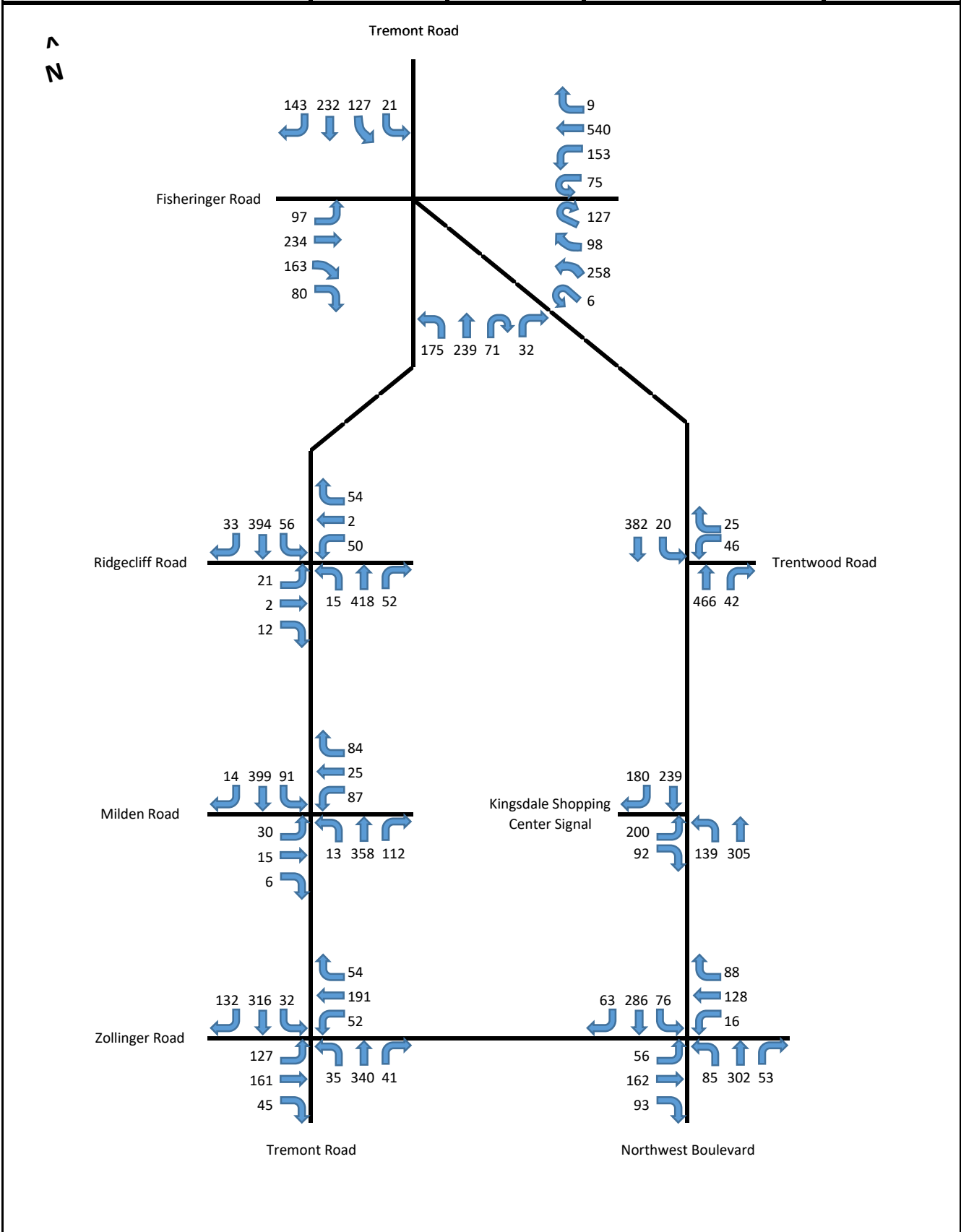
Year	Period	Scenario	Plate
	PM	Pass-By Traffic	C2



Kingsdale Expansion TIS Traffic Volume Calculations



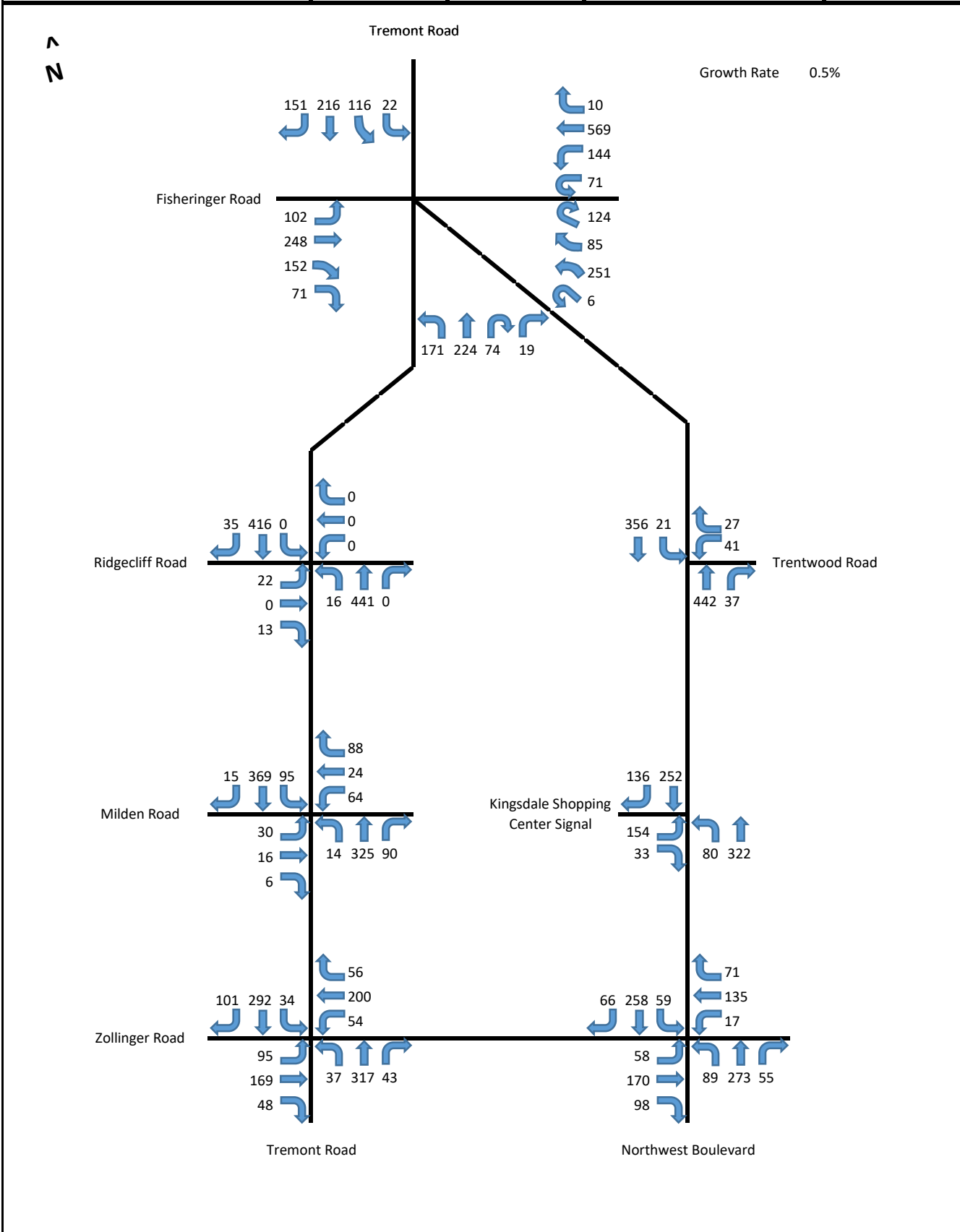
Year	Period	Scenario	Plate
2022	PM	Build	D2 = A2 + B2 + C2



Kingsdale Expansion TIS
Traffic Volume Calculations



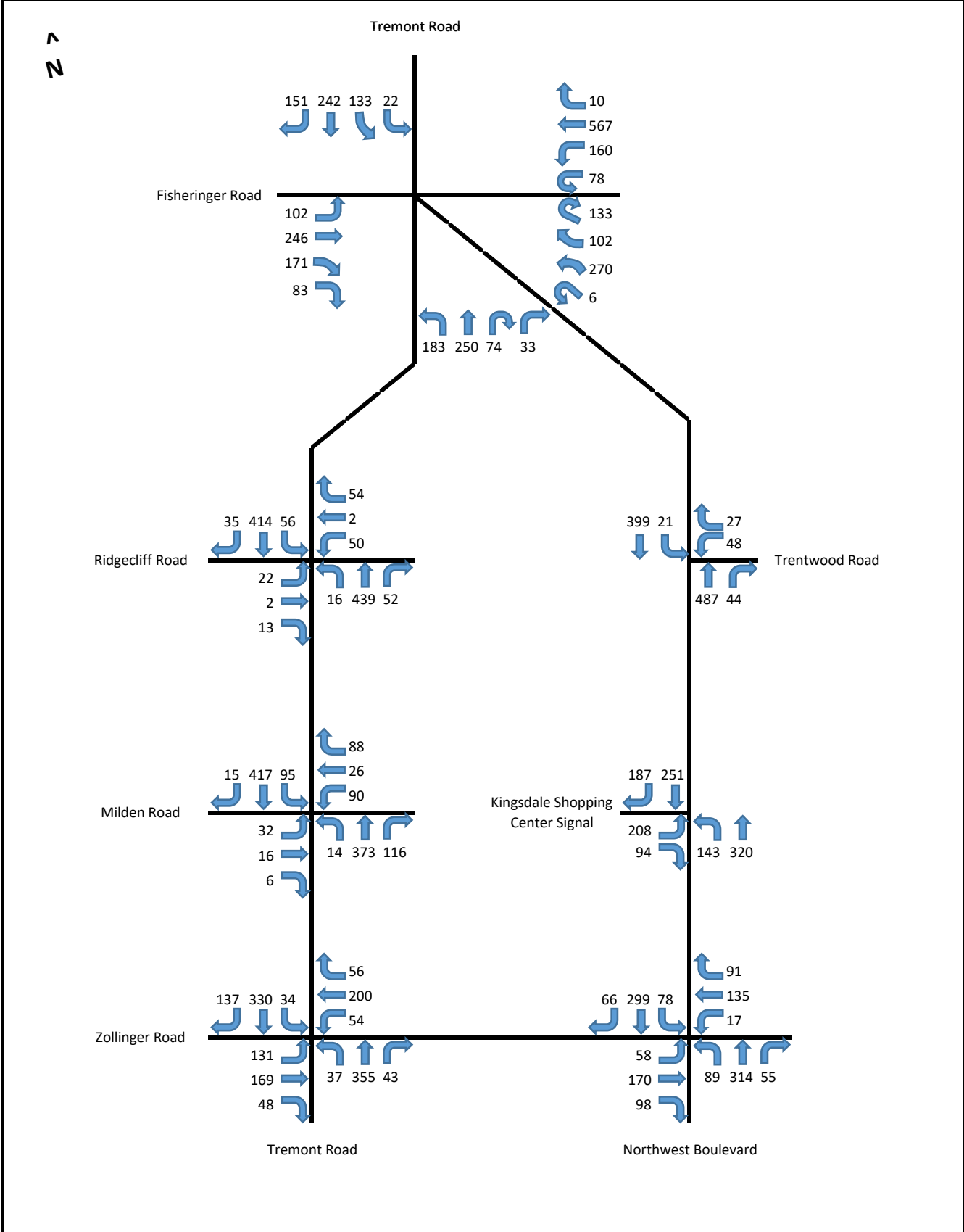
Year	Period	Scenario	Plate
2032	PM	No Build	E2



Kingsdale Expansion TIS
Traffic Volume Calculations



Year	Period	Scenario	Plate
2032	PM	Build	F2 = B2 + C2 + E2

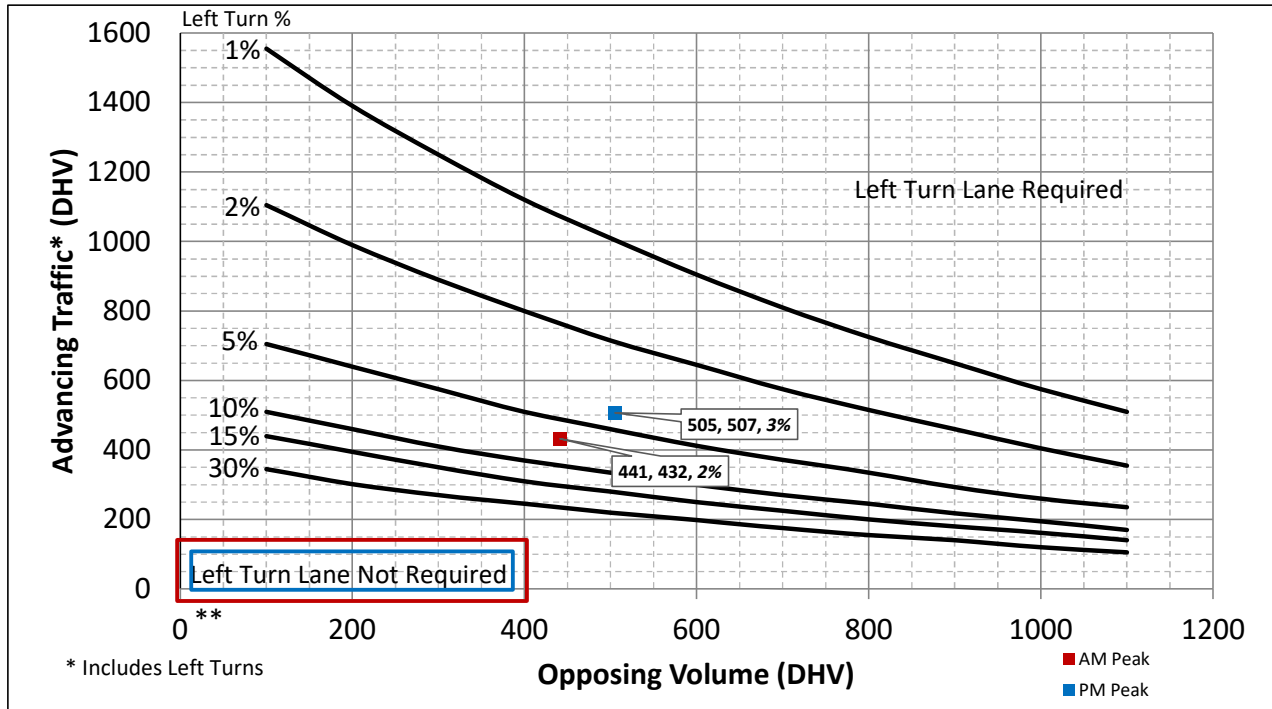


Appendix E

Turn Lane Warrants



2-Lane Highway Left Turn Lane Warrant
(= < 40 mph or 70 kph Posted Speed)



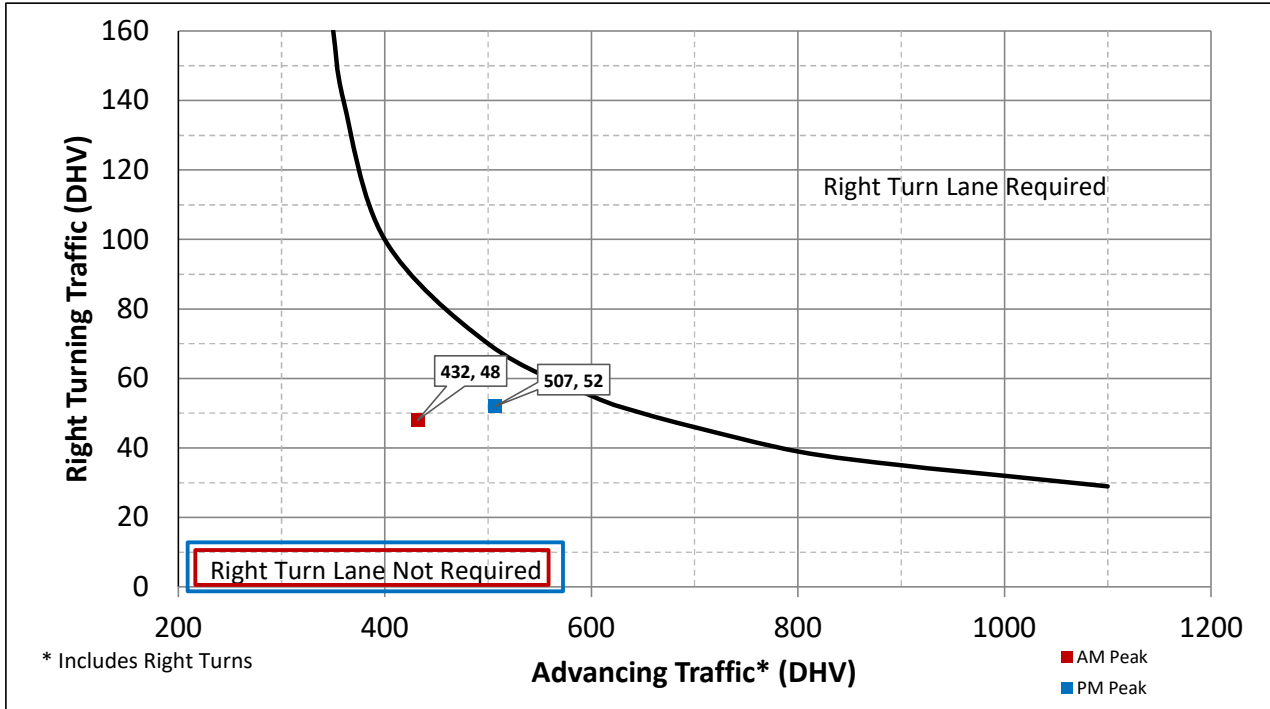
Turn Lane Length Calculations

AM Peak	Design Speed	30	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	Assume 60
	Turn Lane Volume	7	VPH
	Advancing Traffic	432	VPH
	Opposing Volume	441	VPH
	Left Turn Percentage	2%	
	Location Type	Through Road	
	Condition	A	
	Vehicles/Cycle	1	
	Turn Lane Length	100	
Offset Width	12		
Approach Taper	180		
PM Peak	Design Speed	30	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	Assume 60
	Turn Lane Volume	16	VPH
	Advancing Traffic	507	VPH
	Opposing Volume	505	VPH
	Left Turn Percentage	3%	
	Location Type	Through Road	
	Condition	A	
	Vehicles/Cycle	1	
	Turn Lane Length	100	
Offset Width	12		
Approach Taper	180		
Is Left Turn Warrant Met		No	No Left Turn Lane Required

* Turn Lane Length includes 50 ft diverging taper

* Turn Lane Length includes 50 ft diverging taper

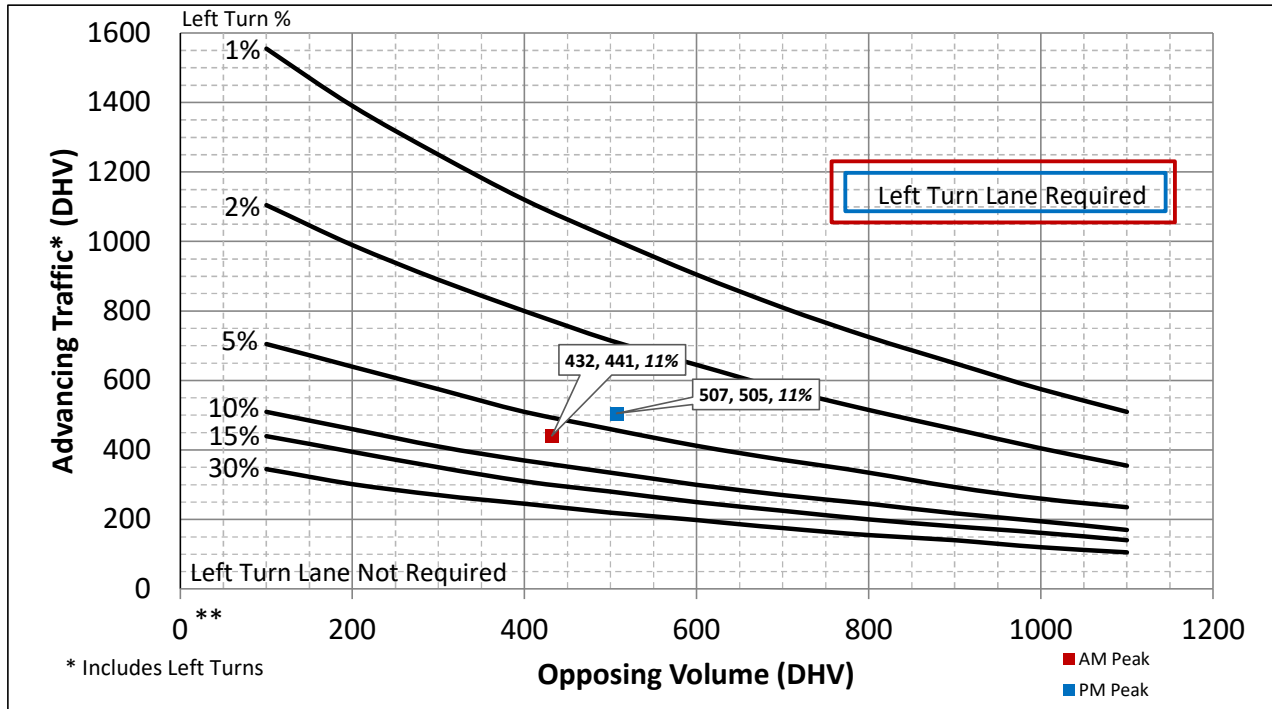
2-Lane Highway Right Turn Lane Warrant
(= < 40 mph or 70 kph Posted Speed)



Turn Lane Length Calculations

AM Peak	Design Speed	30	mph	
	Traffic Control	Unsignalized		
	Cycle Length	Unsignalized		
	Cycles Per Hour	60	Assume 60	
	Turn Lane Volume	48	VPH	
	Advancing Traffic	432	VPH	
	Right Turn Percentage	11%		
	Location Type	Through Road		
	Condition	A		
	Vehicles/Cycle	1		
	Turn Lane Length	100		* Turn Lane Length includes 50 ft diverging taper
PM Peak	Design Speed	30	mph	
	Traffic Control	Unsignalized		
	Cycle Length	Unsignalized		
	Cycles Per Hour	60	Assume 60	
	Turn Lane Volume	52	VPH	
	Advancing Traffic	507	VPH	
	Right Turn Percentage	10%		
	Location Type	Through Road		
	Condition	A		
	Vehicles/Cycle	1		
	Turn Lane Length	100		* Turn Lane Length includes 50 ft diverging taper
Is Right Turn Warrant Met		No	No Right Turn Lane Required	

2-Lane Highway Left Turn Lane Warrant
(= < 40 mph or 70 kph Posted Speed)



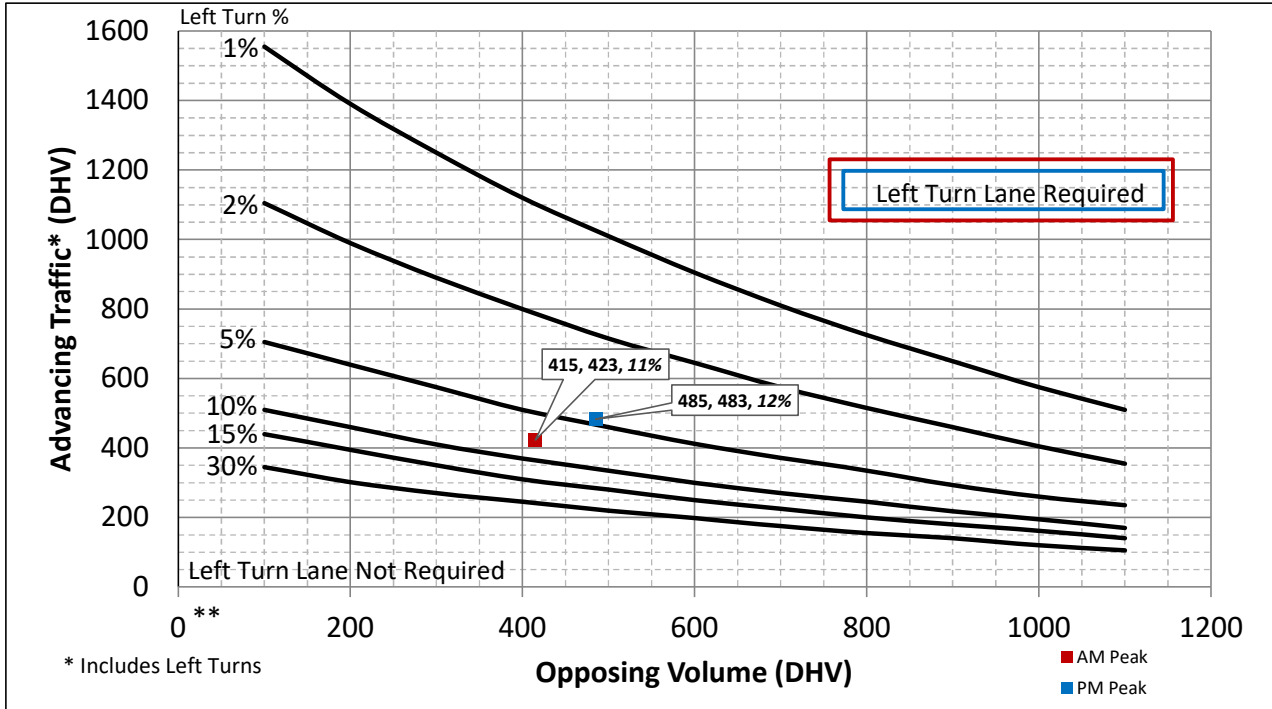
Turn Lane Length Calculations

AM Peak	Design Speed	30	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	Assume 60
	Turn Lane Volume	48	VPH
	Advancing Traffic	441	VPH
	Opposing Volume	432	VPH
	Left Turn Percentage	11%	
	Location Type	Through Road	
	Condition	A	
	Vehicles/Cycle	1	
	Turn Lane Length	100	
	Offset Width	12	
Approach Taper	180		
PM Peak	Design Speed	30	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	Assume 60
	Turn Lane Volume	56	VPH
	Advancing Traffic	505	VPH
	Opposing Volume	507	VPH
	Left Turn Percentage	11%	
	Location Type	Through Road	
	Condition	A	
	Vehicles/Cycle	1	
	Turn Lane Length	100	
	Offset Width	12	
Approach Taper	180		
Is Left Turn Warrant Met		Yes	See Above

* Turn Lane Length includes 50 ft diverging taper

* Turn Lane Length includes 50 ft diverging taper

2-Lane Highway Left Turn Lane Warrant
(= < 40 mph or 70 kph Posted Speed)



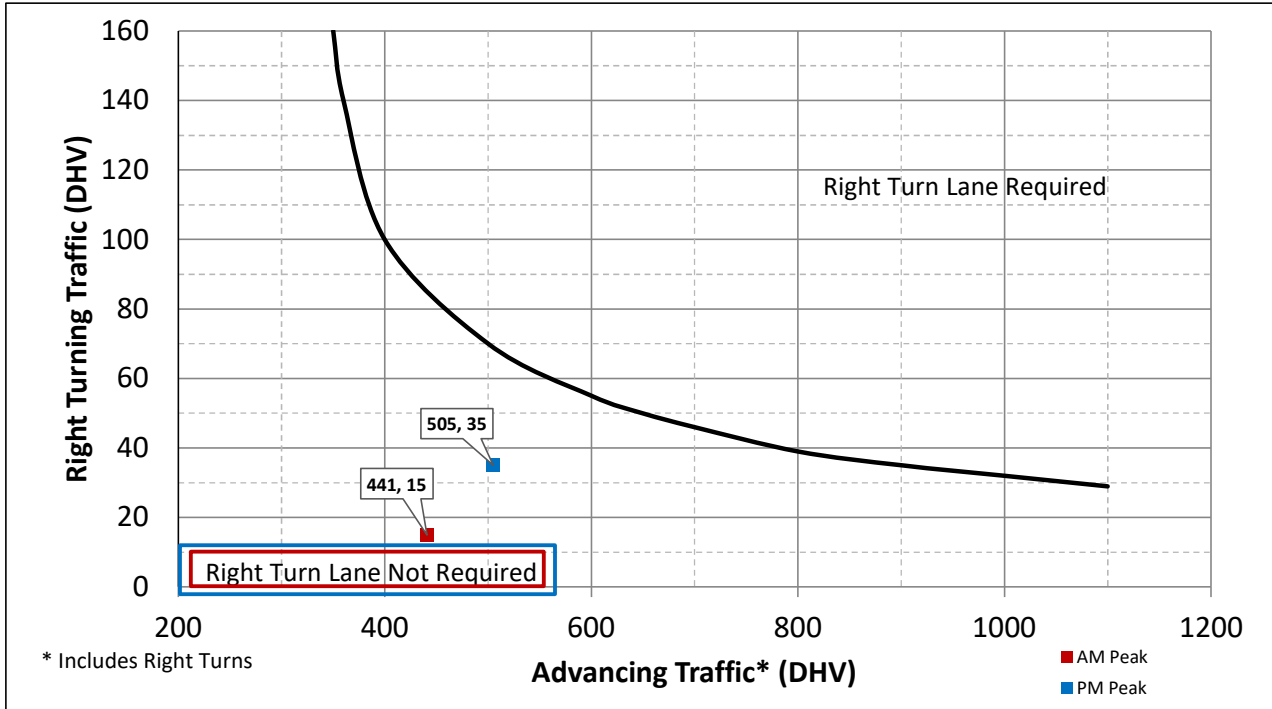
Turn Lane Length Calculations

AM Peak	Design Speed	30	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	Assume 60
	Turn Lane Volume	48	VPH
	Advancing Traffic	423	VPH
	Opposing Volume	415	VPH
	Left Turn Percentage	11%	
	Location Type	Through Road	
	Condition	A	
	Vehicles/Cycle	1	
	Turn Lane Length	100	
	Offset Width	12	
Approach Taper	180		
PM Peak	Design Speed	30	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	Assume 60
	Turn Lane Volume	56	VPH
	Advancing Traffic	483	VPH
	Opposing Volume	485	VPH
	Left Turn Percentage	12%	
	Location Type	Through Road	
	Condition	A	
	Vehicles/Cycle	1	
	Turn Lane Length	100	
	Offset Width	12	
Approach Taper	180		
Is Left Turn Warrant Met		Yes	See Above

* Turn Lane Length includes 50 ft diverging taper

* Turn Lane Length includes 50 ft diverging taper

2-Lane Highway Right Turn Lane Warrant
(= < 40 mph or 70 kph Posted Speed)



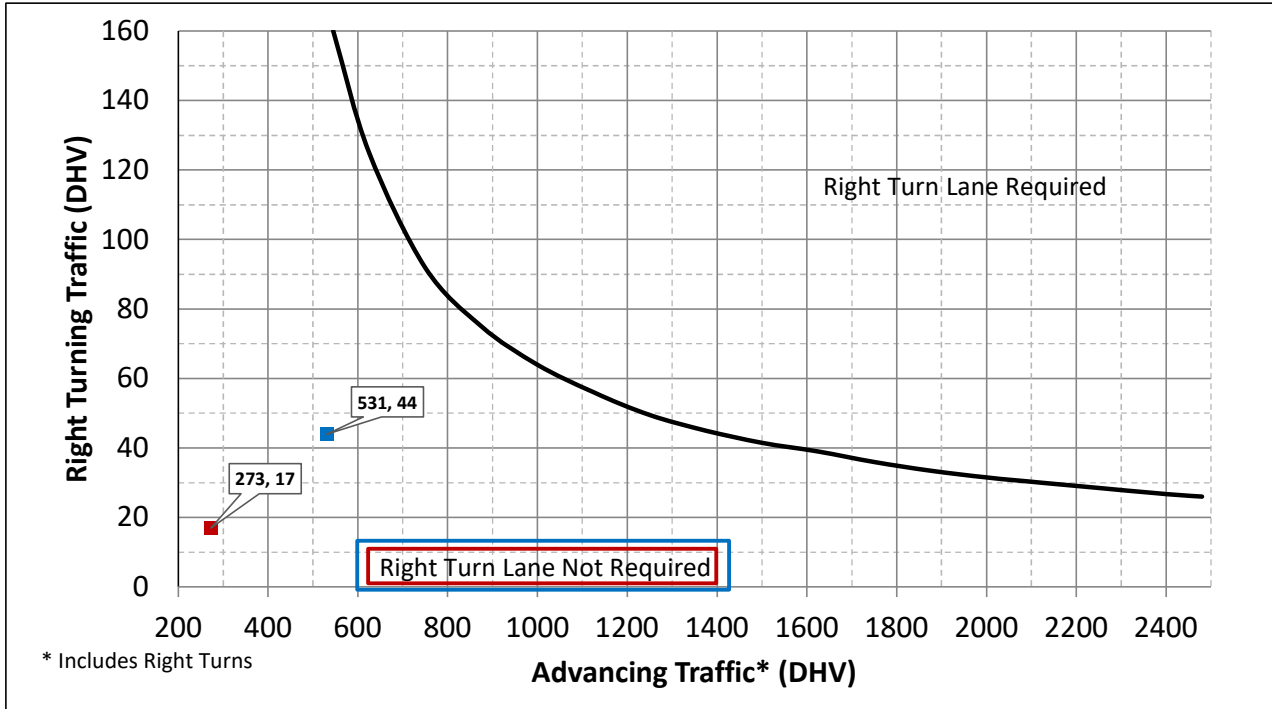
Turn Lane Length Calculations

AM Peak	Design Speed	30	mph	
	Traffic Control	Unsignalized		
	Cycle Length	Unsignalized		
	Cycles Per Hour	60	Assume 60	
	Turn Lane Volume	15	VPH	
	Advancing Traffic	441	VPH	
	Right Turn Percentage	3%		
	Location Type	Through Road		
	Condition	A		
	Vehicles/Cycle	1		
	Turn Lane Length	100		
PM Peak	Design Speed	30	mph	
	Traffic Control	Unsignalized		
	Cycle Length	Unsignalized		
	Cycles Per Hour	60	Assume 60	
	Turn Lane Volume	35	VPH	
	Advancing Traffic	505	VPH	
	Right Turn Percentage	7%		
	Location Type	Through Road		
	Condition	A		
	Vehicles/Cycle	1		
	Turn Lane Length	100		
Is Right Turn Warrant Met		No	No Right Turn Lane Required	

* Turn Lane Length includes 50 ft diverging taper

* Turn Lane Length includes 50 ft diverging taper

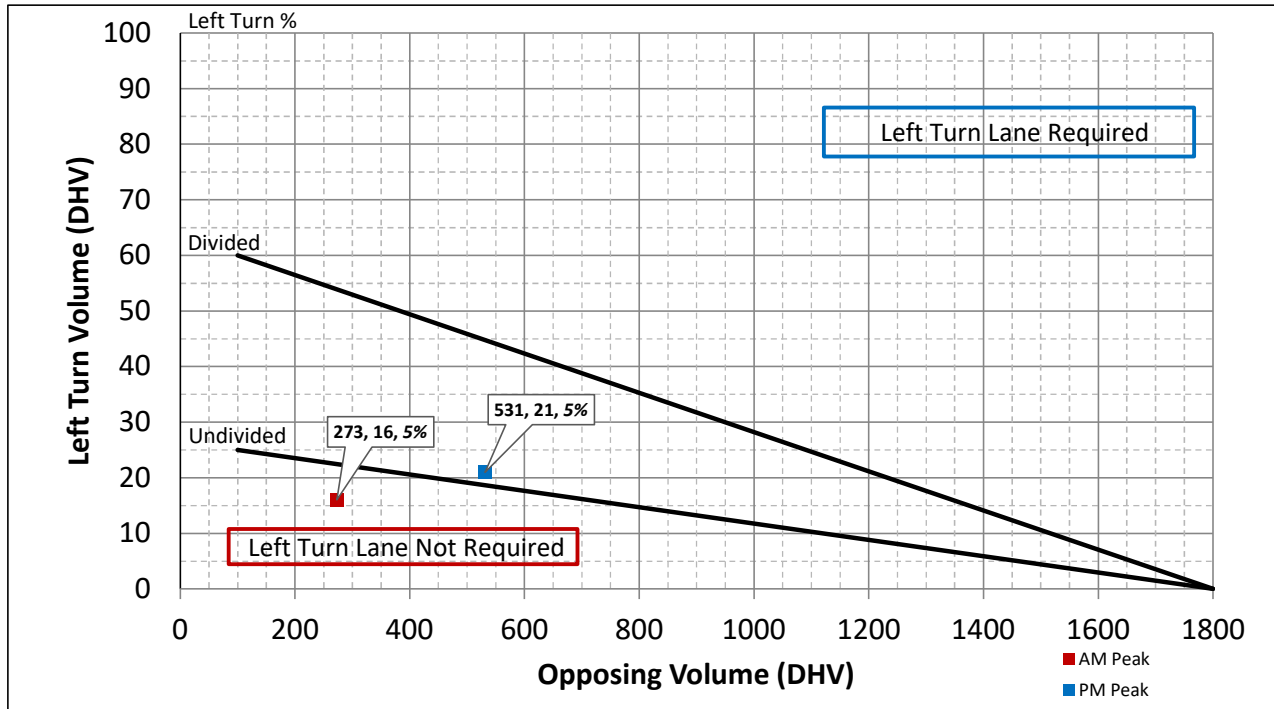
4-Lane Highway Right Turn Lane Warrant
(= < 40 mph or 70 kph Posted Speed)



Turn Lane Length Calculations

AM Peak	Design Speed	40	mph	
	Traffic Control	Unsignalized		
	Cycle Length	Unsignalized		
	Cycles Per Hour	60	Assume 60	
	Turn Lane Volume	17	VPH	
	Advancing Traffic	273	VPH	
	Right Turn Percentage	6%		
	Location Type	Through Road		
	Condition	B		
	Vehicles/Cycle	1		
	Turn Lane Length	125		
PM Peak	Design Speed	40	mph	
	Traffic Control	Unsignalized		
	Cycle Length	Unsignalized		
	Cycles Per Hour	60	Assume 60	
	Turn Lane Volume	44	VPH	
	Advancing Traffic	531	VPH	
	Right Turn Percentage	8%		
	Location Type	Through Road		
	Condition	B		
	Vehicles/Cycle	1		
	Turn Lane Length	125		
Is Right Turn Warrant Met		No	No Right Turn Lane Required	* Turn Lane Length includes 50 ft diverging taper

4-Lane Highway Left Turn Lane Warrant

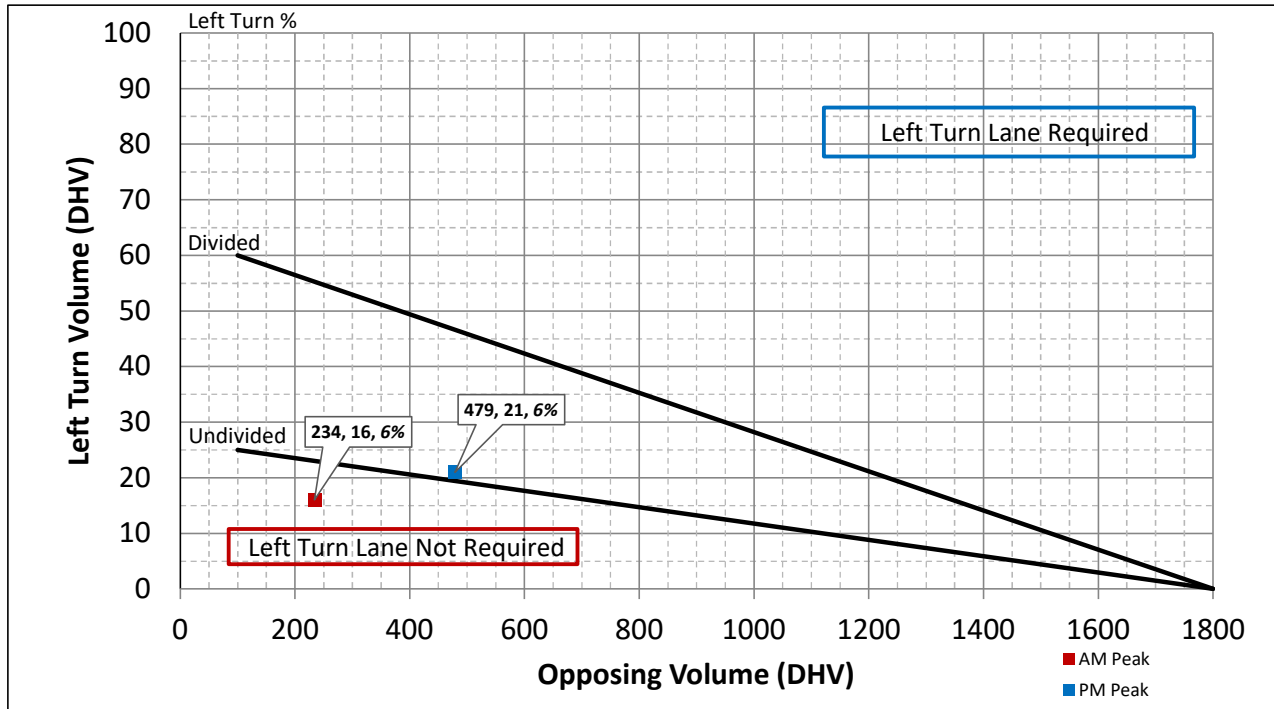


Turn Lane Length Calculations

		Design Speed	40	mph
AM Peak	Traffic Control	Unsignalized		
	Cycle Length	Unsignalized		
	Cycles Per Hour	60	Assume 60	
	Turn Lane Volume	16	VPH	
	Advancing Traffic	293	VPH	
	Opposing Volume	273	VPH	
	Left Turn Percentage	5%		
	Location Type	Through Road		
	Condition	B		
	Vehicles/Cycle	1		
	Turn Lane Length	125		
	Offset Width	12		
	Approach Taper	320		
	PM Peak	Design Speed	40	mph
Traffic Control		Unsignalized		
Cycle Length		Unsignalized		
Cycles Per Hour		60	Assume 60	
Turn Lane Volume		21	VPH	
Advancing Traffic		420	VPH	
Opposing Volume		531	VPH	
Left Turn Percentage		5%		
Location Type		Through Road		
Condition		B		
Vehicles/Cycle		1		
Turn Lane Length		125		
Offset Width		12		
Approach Taper		320		
Is Left Turn Warrant Met		Yes	See Above	

* Turn Lane Length includes 50 ft diverging taper

4-Lane Highway Left Turn Lane Warrant



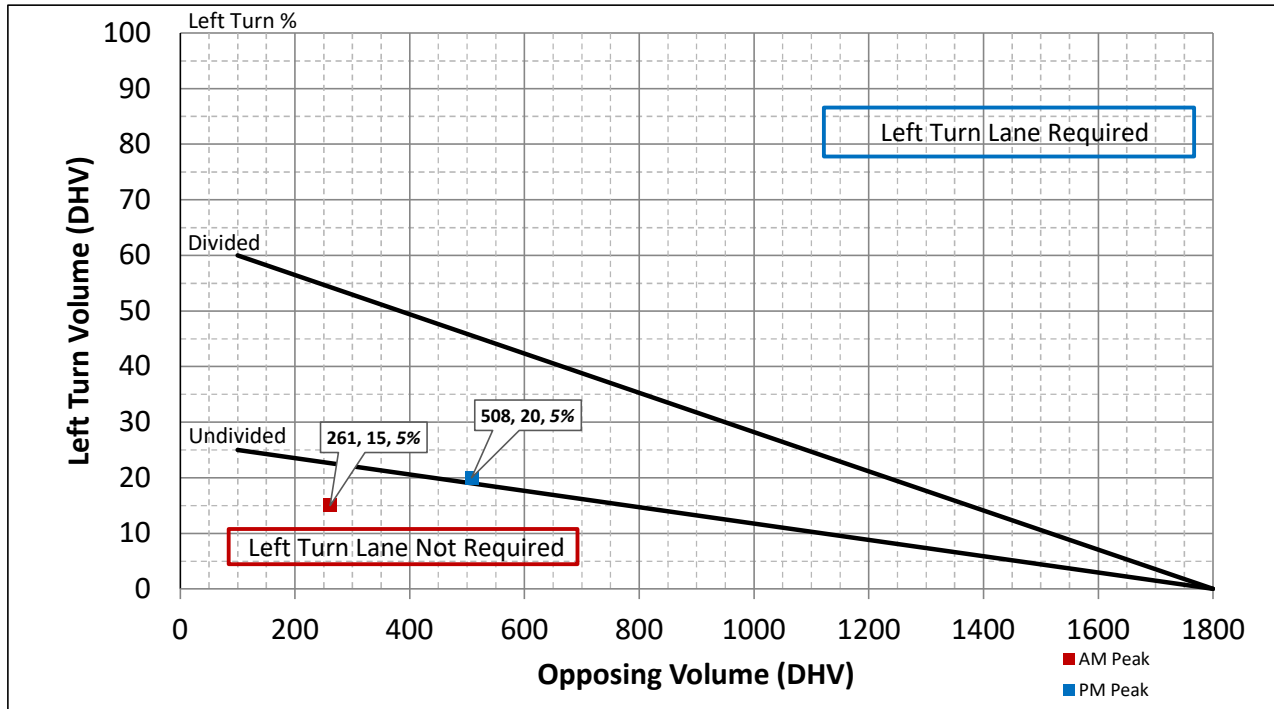
Turn Lane Length Calculations

AM Peak	Design Speed	40	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	Assume 60
	Turn Lane Volume	16	VPH
	Advancing Traffic	252	VPH
	Opposing Volume	234	VPH
	Left Turn Percentage	6%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	125	
	Offset Width	12	
Approach Taper	320		
PM Peak	Design Speed	40	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	Assume 60
	Turn Lane Volume	21	VPH
	Advancing Traffic	377	VPH
	Opposing Volume	479	VPH
	Left Turn Percentage	6%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	125	
	Offset Width	12	
Approach Taper	320		
Is Left Turn Warrant Met		Yes	See Above

* Turn Lane Length includes 50 ft diverging taper

* Turn Lane Length includes 50 ft diverging taper

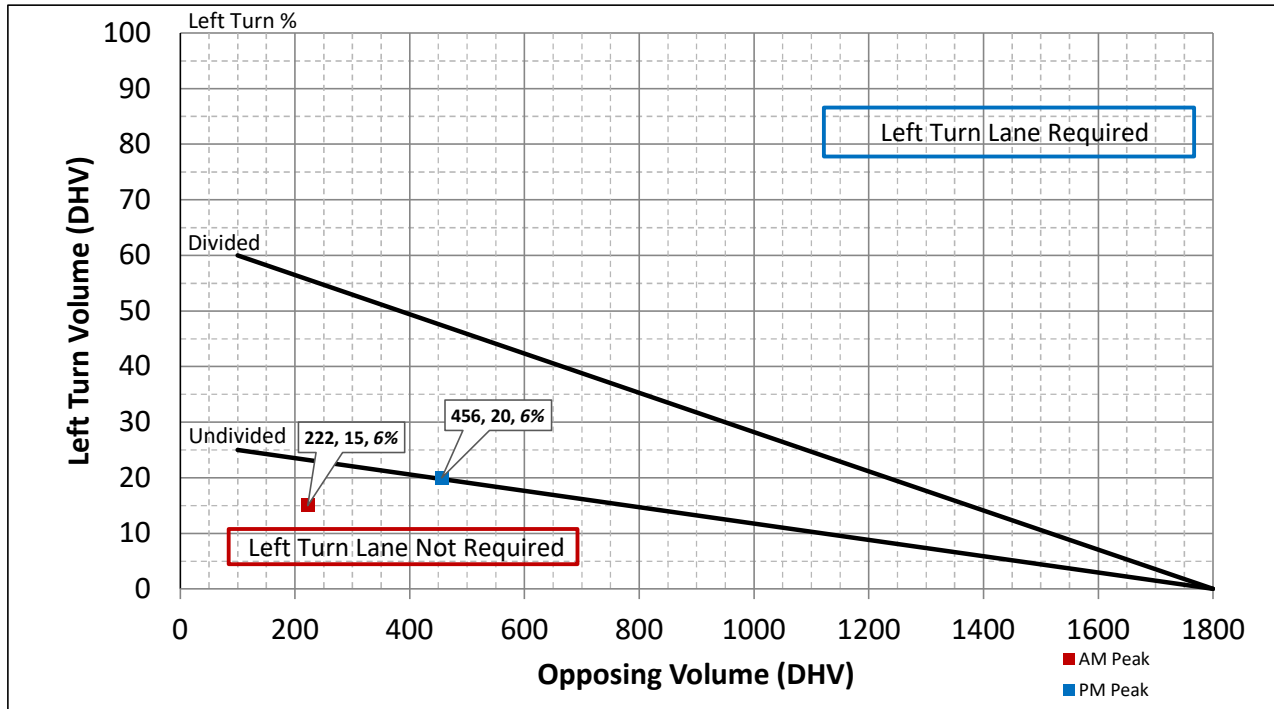
4-Lane Highway Left Turn Lane Warrant



Turn Lane Length Calculations

AM Peak		
Design Speed	40	mph
Traffic Control	Unsignalized	
Cycle Length	Unsignalized	
Cycles Per Hour	60	Assume 60
Turn Lane Volume	15	VPH
Advancing Traffic	281	VPH
Opposing Volume	261	VPH
Left Turn Percentage	5%	
Location Type	Through Road	
Condition	B	
Vehicles/Cycle	1	
Turn Lane Length	125	* Turn Lane Length includes 50 ft diverging taper
Offset Width	12	
Approach Taper	320	
PM Peak		
Design Speed	40	mph
Traffic Control	Unsignalized	
Cycle Length	Unsignalized	
Cycles Per Hour	60	Assume 60
Turn Lane Volume	20	VPH
Advancing Traffic	402	VPH
Opposing Volume	508	VPH
Left Turn Percentage	5%	
Location Type	Through Road	
Condition	B	
Vehicles/Cycle	1	
Turn Lane Length	125	* Turn Lane Length includes 50 ft diverging taper
Offset Width	12	
Approach Taper	320	
Is Left Turn Warrant Met	Yes	See Above

4-Lane Highway Left Turn Lane Warrant



Turn Lane Length Calculations

AM Peak	Design Speed	40	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	Assume 60
	Turn Lane Volume	15	VPH
	Advancing Traffic	240	VPH
	Opposing Volume	222	VPH
	Left Turn Percentage	6%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	125	
	Offset Width	12	
Approach Taper	320		
PM Peak	Design Speed	40	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	Assume 60
	Turn Lane Volume	20	VPH
	Advancing Traffic	359	VPH
	Opposing Volume	456	VPH
	Left Turn Percentage	6%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	125	
	Offset Width	12	
Approach Taper	320		
Is Left Turn Warrant Met		Yes	See Above

* Turn Lane Length includes 50 ft diverging taper

* Turn Lane Length includes 50 ft diverging taper

Right Turn Lane Length Calculations

AM Peak	Design Speed	40	mph
	Traffic Control	Signalized - 4 Phase	
	Cycle Length	Known	
	Cycles Per Hour	25.7	<i>Enter Cycles Per Hour</i>
	Turn Lane Volume	187	VPH
	Advancing Traffic	1035	VPH
	Right Turn Percentage	18%	
	Location Type	Intersection	
	Condition	B or C	
	Vehicles/Cycle	8	
	Turn Lane Length	See Column to Right	440
PM Peak	Design Speed	40	mph
	Traffic Control	Signalized - 4 Phase	
	Cycle Length	Known	
	Cycles Per Hour	25.7	<i>Enter Cycles Per Hour</i>
	Turn Lane Volume	212	VPH
	Advancing Traffic	545	VPH
	Right Turn Percentage	39%	
	Location Type	Intersection	
	Condition	B or C	
	Vehicles/Cycle	9	
	Turn Lane Length	See Column to Right	465



Right Turn Lane Length Calculations

AM Peak	Design Speed	40	mph
	Traffic Control	Signalized - 4 Phase	
	Cycle Length	Known	
	Cycles Per Hour	25.7	<i>Enter Cycles Per Hour</i>
	Turn Lane Volume	146	VPH
	Advancing Traffic	1062	VPH
	Right Turn Percentage	14%	
	Location Type	Intersection	
	Condition	B or C	
	Vehicles/Cycle	6	
	Turn Lane Length	See Column to Right	365
PM Peak	Design Speed	40	mph
	Traffic Control	Signalized - 4 Phase	
	Cycle Length	Known	
	Cycles Per Hour	25.7	<i>Enter Cycles Per Hour</i>
	Turn Lane Volume	163	VPH
	Advancing Traffic	574	VPH
	Right Turn Percentage	28%	
	Location Type	Intersection	
	Condition	B or C	
	Vehicles/Cycle	7	
	Turn Lane Length	See Column to Right	390



Right Turn Lane Length Calculations

AM Peak	Design Speed	40	mph
	Traffic Control	Signalized - 4 Phase	
	Cycle Length	Known	
	Cycles Per Hour	25.7	<i>Enter Cycles Per Hour</i>
	Turn Lane Volume	135	VPH
	Advancing Traffic	1085	VPH
	Right Turn Percentage	12%	
	Location Type	Intersection	
	Condition	B or C	
	Vehicles/Cycle	6	
	Turn Lane Length	See Column to Right	365
PM Peak	Design Speed	40	mph
	Traffic Control	Signalized - 4 Phase	
	Cycle Length	Known	
	Cycles Per Hour	25.7	<i>Enter Cycles Per Hour</i>
	Turn Lane Volume	152	VPH
	Advancing Traffic	573	VPH
	Right Turn Percentage	27%	
	Location Type	Intersection	
	Condition	B or C	
	Vehicles/Cycle	6	
	Turn Lane Length	See Column to Right	365



Right Turn Lane Length Calculations

AM Peak	Design Speed	40	mph
	Traffic Control	Signalized - 4 Phase	
	Cycle Length	Known	
	Cycles Per Hour	25.7	<i>Enter Cycles Per Hour</i>
	Turn Lane Volume	223	VPH
	Advancing Traffic	1112	VPH
	Right Turn Percentage	20%	
	Location Type	Intersection	
	Condition	B or C	
	Vehicles/Cycle	9	
	Turn Lane Length	See Column to Right	465
PM Peak	Design Speed	40	mph
	Traffic Control	Signalized - 4 Phase	
	Cycle Length	Known	
	Cycles Per Hour	25.7	<i>Enter Cycles Per Hour</i>
	Turn Lane Volume	254	VPH
	Advancing Traffic	602	VPH
	Right Turn Percentage	42%	
	Location Type	Intersection	
	Condition	B or C	
	Vehicles/Cycle	10	
	Turn Lane Length	See Column to Right	490



Appendix F

Capacity Analysis



Baseline Capacity Analysis

Timing Report, Sorted By Phase

7: Tremont Road & Zollinger Road

09/21/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	59	41	59	41
Maximum Split (%)	59.0%	41.0%	59.0%	41.0%
Minimum Split (s)	42	29.5	42	29.5
Yellow Time (s)	4	3.5	4	3.5
All-Red Time (s)	2	1	2	1
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	12	8	12	8
Flash Dont Walk (s)	24	17	24	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	59	0	59
End Time (s)	59	0	59	0
Yield/Force Off (s)	53	95.5	53	95.5
Yield/Force Off 170(s)	29	78.5	29	78.5
Local Start Time (s)	0	59	0	59
Local Yield (s)	53	95.5	53	95.5
Local Yield 170(s)	29	78.5	29	78.5

Intersection Summary

Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 7: Tremont Road & Zollinger Road



HCM 6th Signalized Intersection Summary
 7: Tremont Road & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (veh/h)	98	185	15	20	84	36	10	199	28	35	174	63
Future Volume (veh/h)	98	185	15	20	84	36	10	199	28	35	174	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	107	201	16	22	91	39	11	216	30	38	189	68
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	218	623	49	228	232	99	867	1138	158	824	930	335
Arrive On Green	0.19	0.19	0.19	0.06	0.06	0.06	0.71	0.71	0.71	1.00	1.00	1.00
Sat Flow, veh/h	1260	3336	263	1164	1242	532	1123	1607	223	1134	1313	472
Grp Volume(v), veh/h	107	106	111	22	0	130	11	0	246	38	0	257
Grp Sat Flow(s),veh/h/ln	1260	1777	1823	1164	0	1775	1123	0	1830	1134	0	1785
Q Serve(g_s), s	8.2	5.2	5.3	1.8	0.0	7.0	0.3	0.0	4.5	0.2	0.0	0.0
Cycle Q Clear(g_c), s	15.2	5.2	5.3	7.1	0.0	7.0	0.3	0.0	4.5	4.8	0.0	0.0
Prop In Lane	1.00		0.14	1.00		0.30	1.00		0.12	1.00		0.26
Lane Grp Cap(c), veh/h	218	332	340	228	0	331	867	0	1297	824	0	1265
V/C Ratio(X)	0.49	0.32	0.33	0.10	0.00	0.39	0.01	0.00	0.19	0.05	0.00	0.20
Avail Cap(c_a), veh/h	443	649	665	436	0	648	867	0	1297	824	0	1265
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	1.00	1.00	0.84	0.00	0.84	1.00	0.00	1.00	0.99	0.00	0.99
Uniform Delay (d), s/veh	42.7	35.2	35.2	44.0	0.0	41.5	4.3	0.0	4.9	0.2	0.0	0.0
Incr Delay (d2), s/veh	1.7	0.6	0.6	0.2	0.0	0.6	0.0	0.0	0.3	0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	2.3	2.3	0.6	0.0	3.2	0.1	0.0	1.7	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.4	35.7	35.8	44.2	0.0	42.1	4.3	0.0	5.2	0.3	0.0	0.4
LnGrp LOS	D	D	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		324			152			257			295	
Approach Delay, s/veh		38.6			42.4			5.2			0.3	
Approach LOS		D			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		76.8		23.2		76.8		23.2				
Change Period (Y+Rc), s		6.0		4.5		6.0		4.5				
Max Green Setting (Gmax), s		53.0		36.5		53.0		36.5				
Max Q Clear Time (g_c+I1), s		6.5		17.2		6.8		9.1				
Green Ext Time (p_c), s		1.7		1.4		2.0		0.8				
Intersection Summary												
HCM 6th Ctrl Delay				19.8								
HCM 6th LOS				B								

Timing Report, Sorted By Phase

8: Northwest Boulevard & Zollinger Road

09/21/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	27	24	24	25
Maximum Split (%)	27.0%	24.0%	24.0%	25.0%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	51	27	75
End Time (s)	27	75	51	0
Yield/Force Off (s)	22	70	46	95
Yield/Force Off 170(s)	11	59	35	84
Local Start Time (s)	0	51	27	75
Local Yield (s)	22	70	46	95
Local Yield 170(s)	11	59	35	84

Intersection Summary

Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
 8: Northwest Boulevard & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	31	105	75	24	77	18	84	177	34	20	156	32
Future Volume (veh/h)	31	105	75	24	77	18	84	177	34	20	156	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	114	82	26	84	20	91	192	37	22	170	35
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	47	160	118	35	113	127	430	957	191	65	513	110
Arrive On Green	0.09	0.09	0.09	0.08	0.08	0.08	0.44	0.44	0.44	0.06	0.06	0.06
Sat Flow, veh/h	509	1717	1263	437	1412	1585	985	2191	437	340	2702	578
Grp Volume(v), veh/h	123	0	107	110	0	20	168	0	152	120	0	107
Grp Sat Flow(s),veh/h/ln	1845	0	1643	1849	0	1585	1821	0	1792	1853	0	1766
Q Serve(g_s), s	6.5	0.0	6.3	5.8	0.0	1.2	5.7	0.0	5.2	6.2	0.0	5.8
Cycle Q Clear(g_c), s	6.5	0.0	6.3	5.8	0.0	1.2	5.7	0.0	5.2	6.2	0.0	5.8
Prop In Lane	0.28		0.77	0.24		1.00	0.54		0.24	0.18		0.33
Lane Grp Cap(c), veh/h	172	0	153	148	0	127	795	0	782	352	0	336
V/C Ratio(X)	0.72	0.00	0.70	0.74	0.00	0.16	0.21	0.00	0.19	0.34	0.00	0.32
Avail Cap(c_a), veh/h	351	0	312	370	0	317	795	0	782	352	0	336
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	0.94	0.00	0.94	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.0	0.0	44.0	45.0	0.0	42.9	17.5	0.0	17.3	40.9	0.0	40.7
Incr Delay (d2), s/veh	5.1	0.0	5.3	7.2	0.0	0.6	0.6	0.0	0.6	2.6	0.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	2.7	2.9	0.0	0.5	2.5	0.0	2.2	3.2	0.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.2	0.0	49.2	52.2	0.0	43.4	18.1	0.0	17.9	43.5	0.0	43.2
LnGrp LOS	D	A	D	D	A	D	B	A	B	D	A	D
Approach Vol, veh/h		230			130			320				227
Approach Delay, s/veh		49.2			50.8			18.0				43.3
Approach LOS		D			D			B				D
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.7		14.3		24.0		13.0				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		22.0		19.0		19.0		20.0				
Max Q Clear Time (g_c+I1), s		7.7		8.5		8.2		7.8				
Green Ext Time (p_c), s		1.5		0.9		0.8		0.4				
Intersection Summary												
HCM 6th Ctrl Delay				37.0								
HCM 6th LOS				D								

HCM 6th TWSC
 11: Tremont Road & Ridgecliff Road

09/21/2020

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	8	7	360	361	14
Future Vol, veh/h	25	8	7	360	361	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	190	-	-	-
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	27	9	8	391	392	15

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	807	400	407	0	-	0
Stage 1	400	-	-	-	-	-
Stage 2	407	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	351	650	1152	-	-	-
Stage 1	677	-	-	-	-	-
Stage 2	672	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	349	650	1152	-	-	-
Mov Cap-2 Maneuver	349	-	-	-	-	-
Stage 1	672	-	-	-	-	-
Stage 2	672	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.1	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1152	-	393	-	-
HCM Lane V/C Ratio	0.007	-	0.091	-	-
HCM Control Delay (s)	8.1	-	15.1	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Timing Report, Sorted By Phase
 13: Tremont Road & Milden Road

09/21/2020

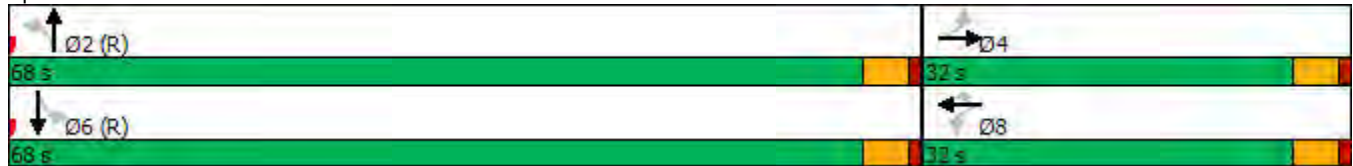


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	68	32	68	32
Maximum Split (%)	68.0%	32.0%	68.0%	32.0%
Minimum Split (s)	24.5	27.5	24.5	27.5
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	10	10	10	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	13	16	13	16
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	68	0	68
End Time (s)	68	0	68	0
Yield/Force Off (s)	63.5	95.5	63.5	95.5
Yield/Force Off 170(s)	50.5	79.5	50.5	79.5
Local Start Time (s)	0	68	0	68
Local Yield (s)	63.5	95.5	63.5	95.5
Local Yield 170(s)	50.5	79.5	50.5	79.5

Intersection Summary

Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	55
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 13: Tremont Road & Milden Road



HCM 6th Signalized Intersection Summary

13: Tremont Road & Milden Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	14	6	7	21	8	27	8	315	34	60	261	7
Future Volume (veh/h)	14	6	7	21	8	27	8	315	34	60	261	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	7	8	23	9	29	9	342	37	65	284	8
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	109	51	39	155	51	146	924	1357	147	893	1481	42
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	1.00	1.00	1.00	0.82	0.82	0.82
Sat Flow, veh/h	601	553	420	1008	553	1585	1087	1659	179	1004	1810	51
Grp Volume(v), veh/h	30	0	0	32	0	29	9	0	379	65	0	292
Grp Sat Flow(s),veh/h/ln	1575	0	0	1561	0	1585	1087	0	1838	1004	0	1861
Q Serve(g_s), s	0.0	0.0	0.0	0.1	0.0	1.7	0.0	0.0	0.0	1.3	0.0	3.4
Cycle Q Clear(g_c), s	1.6	0.0	0.0	1.6	0.0	1.7	3.4	0.0	0.0	1.3	0.0	3.4
Prop In Lane	0.50		0.27	0.72		1.00	1.00		0.10	1.00		0.03
Lane Grp Cap(c), veh/h	199	0	0	206	0	146	924	0	1504	893	0	1522
V/C Ratio(X)	0.15	0.00	0.00	0.16	0.00	0.20	0.01	0.00	0.25	0.07	0.00	0.19
Avail Cap(c_a), veh/h	477	0	0	481	0	436	924	0	1504	893	0	1522
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	1.00	0.95	0.00	0.95	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.9	0.0	0.0	41.9	0.0	42.0	0.1	0.0	0.0	1.8	0.0	2.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.3	0.0	0.7	0.0	0.0	0.4	0.2	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.8	0.0	0.7	0.0	0.0	0.2	0.2	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.3	0.0	0.0	42.3	0.0	42.7	0.1	0.0	0.4	1.9	0.0	2.2
LnGrp LOS	D	A	A	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		30			61			388			357	
Approach Delay, s/veh		42.3			42.5			0.4			2.2	
Approach LOS		D			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		86.3		13.7		86.3		13.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		63.5		27.5		63.5		27.5				
Max Q Clear Time (g_c+I1), s		5.4		3.6		5.4		3.7				
Green Ext Time (p_c), s		2.9		0.1		2.4		0.2				
Intersection Summary												
HCM 6th Ctrl Delay				5.7								
HCM 6th LOS				A								

HCM 6th TWSC
 16: Northwest Boulevard & Trentwood Road

09/21/2020

Intersection						
Int Delay, s/veh	1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑			↑↑
Traffic Vol, veh/h	36	27	212	10	15	225
Future Vol, veh/h	36	27	212	10	15	225
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	39	29	230	11	16	245

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	391	121	0	0	241
Stage 1	236	-	-	-	-
Stage 2	155	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	585	908	-	-	1323
Stage 1	781	-	-	-	-
Stage 2	857	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	577	908	-	-	1323
Mov Cap-2 Maneuver	577	-	-	-	-
Stage 1	770	-	-	-	-
Stage 2	857	-	-	-	-

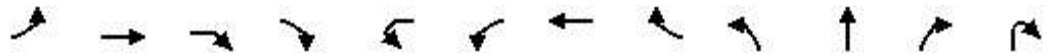
Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	684	1323
HCM Lane V/C Ratio	-	-	0.1	0.012
HCM Control Delay (s)	-	-	10.8	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	153	695	128	59	25	83	241	9	97	160	152	25
Future Volume (vph)	153	695	128	59	25	83	241	9	97	160	152	25
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0				175	0	140		200	
Storage Lanes	1		0				1	0	1		2	
Taper Length (ft)	25						25		25			
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt		0.968					0.994				0.850	0.850
Flt Protected	0.950					0.950			0.950			
Satd. Flow (prot)	1770	3426	0	0	0	1770	3518	0	1770	1863	1583	1583
Flt Permitted	0.438					0.132			0.527			
Satd. Flow (perm)	816	3426	0	0	0	246	3518	0	982	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												242
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			440		
Travel Time (s)		22.6					18.2			12.0		
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
Adj. Flow (vph)	166	755	139	64	27	90	262	10	105	174	165	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	166	958	0	0	0	117	272	0	105	174	165	27
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA			Perm	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2				1	6		7	4		
Permitted Phases	2				6	6			4		4	Free
Minimum Split (s)	10.5	36.0			30.0	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	17.7	43.0			36.3	11.0	36.3		10.5	33.7	33.7	
Total Split (%)	12.6%	30.7%			25.9%	7.9%	25.9%		7.5%	24.1%	24.1%	
Maximum Green (s)	12.2	37.0			30.3	5.5	30.3		5.0	27.7	27.7	
Yellow Time (s)	3.5	4.0			4.0	3.5	4.0		3.5	4.0	4.0	
All-Red Time (s)	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	
Total Lost Time (s)	5.5	6.0				5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag			Lag	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0			10.0		10.0			10.0	10.0	
Flash Dont Walk (s)		20.0			14.0		14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0			0	0	
Act Effct Green (s)	48.5	37.0				36.3	30.3		33.2	27.7	27.7	140.0
Actuated g/C Ratio	0.35	0.26				0.26	0.22		0.24	0.20	0.20	1.00
v/c Ratio	0.45	1.06				0.95	0.36		0.40	0.47	0.53	0.02

OY AM No Build

Synchro 10 Report

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	73	143	208	99	1	142	63	75
Future Volume (vph)	73	143	208	99	1	142	63	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.425				0.950		
Satd. Flow (perm)	0	792	1863	1583	0	3433	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				109				242
Link Speed (mph)			35			35		
Link Distance (ft)			1258			362		
Travel Time (s)			24.5			7.1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	155	226	108	1	154	68	82
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	234	226	108	0	155	68	82
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	15.8	15.8	39.0	17.7	36.5	36.5	36.5	
Total Split (%)	11.3%	11.3%	27.9%	12.6%	26.1%	26.1%	26.1%	
Maximum Green (s)	10.3	10.3	33.0	12.2	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		43.8	33.0	45.7		31.0	31.0	140.0
Actuated g/C Ratio		0.31	0.24	0.33		0.22	0.22	1.00
v/c Ratio		0.73	0.51	0.18		0.20	0.19	0.05

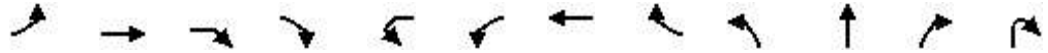
OY AM No Build

Synchro 10 Report

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020

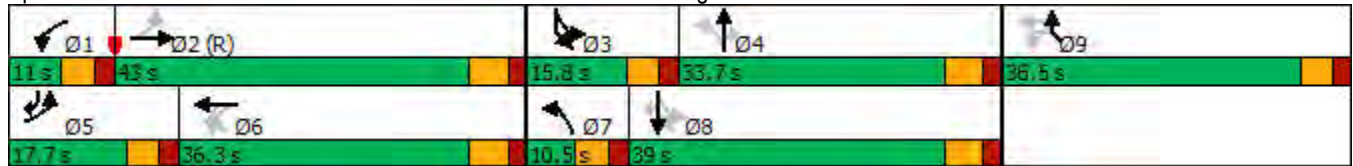


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Control Delay	37.6	95.5				108.1	48.2		43.4	54.6	57.3	0.0
Queue Delay	0.0	0.0				0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	37.6	95.5				108.1	48.2		43.4	54.6	57.3	0.0
LOS	D	F				F	D		D	D	E	A
Approach Delay		86.9					66.2			49.9		
Approach LOS		F					E			D		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	145
Control Type:	Pretimed
Maximum v/c Ratio:	1.06
Intersection Signal Delay:	63.7
Intersection LOS:	E
Intersection Capacity Utilization	82.1%
ICU Level of Service	E
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		54.3	51.4	3.6		45.3	46.2	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		54.3	51.4	3.6		45.3	46.2	0.1
LOS		D	D	A		D	D	A
Approach Delay			43.5			33.3		
Approach LOS			D			C		
Intersection Summary								

Lanes, Volumes, Timings

18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	38	3	29	183	190	58
Future Volume (vph)	38	3	29	183	190	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110	110	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Frt		0.850			0.965	
Flt Protected	0.950			0.993		
Satd. Flow (prot)	1770	1583	0	3514	3415	0
Flt Permitted	0.950			0.888		
Satd. Flow (perm)	1770	1583	0	3143	3415	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		3			55	
Link Speed (mph)	25			35	35	
Link Distance (ft)	368			1084	512	
Travel Time (s)	10.0			21.1	10.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	3	32	199	207	63
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	3	0	231	270	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			

OY AM No Build

Synchro 10 Report

Lanes, Volumes, Timings
 18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020

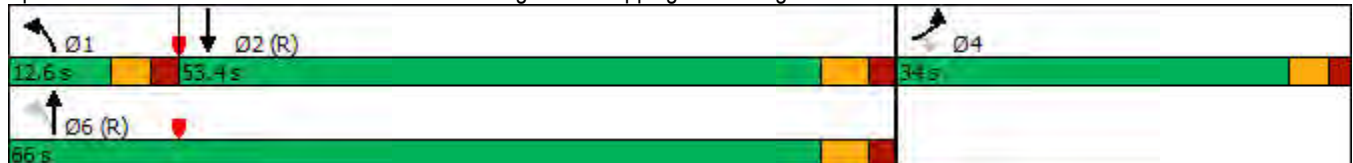


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	1	6	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0	7.0	10.0	10.0	
Minimum Split (s)	26.8	26.8	12.6	27.6	35.6	
Total Split (s)	34.0	34.0	12.6	66.0	53.4	
Total Split (%)	34.0%	34.0%	12.6%	66.0%	53.4%	
Maximum Green (s)	29.2	29.2	7.6	60.4	47.8	
Yellow Time (s)	3.0	3.0	3.0	3.6	3.6	
All-Red Time (s)	1.8	1.8	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.8	4.8		5.6	5.6	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effect Green (s)	8.6	8.6		88.3	88.3	
Actuated g/C Ratio	0.09	0.09		0.88	0.88	
v/c Ratio	0.27	0.02		0.08	0.09	
Control Delay	47.1	27.3		5.7	1.3	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	47.1	27.3		5.7	1.3	
LOS	D	C		A	A	
Approach Delay	45.7			5.7	1.3	
Approach LOS	D			A	A	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.27
 Intersection Signal Delay: 6.8
 Intersection LOS: A
 Intersection Capacity Utilization 36.7%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 18: Northwest Boulevard & Kingsdale Shopping Center Signal



Timing Report, Sorted By Phase
7: Tremont Road & Zollinger Road

09/21/2020

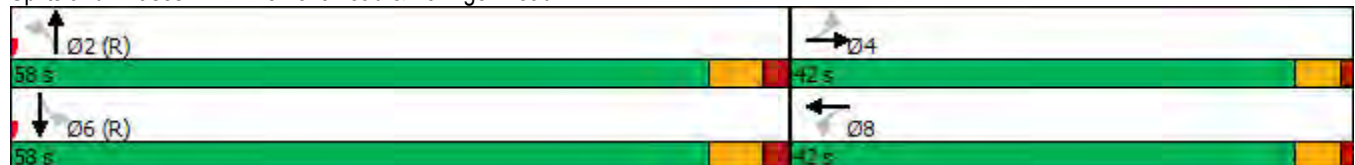


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	58	42	58	42
Maximum Split (%)	58.0%	42.0%	58.0%	42.0%
Minimum Split (s)	42	29.5	42	29.5
Yellow Time (s)	4	3.5	4	3.5
All-Red Time (s)	2	1	2	1
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	12	8	12	8
Flash Dont Walk (s)	24	17	24	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	58	0	58
End Time (s)	58	0	58	0
Yield/Force Off (s)	52	95.5	52	95.5
Yield/Force Off 170(s)	28	78.5	28	78.5
Local Start Time (s)	0	58	0	58
Local Yield (s)	52	95.5	52	95.5
Local Yield 170(s)	28	78.5	28	78.5

Intersection Summary

Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 7: Tremont Road & Zollinger Road



HCM 6th Signalized Intersection Summary
7: Tremont Road & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (veh/h)	132	185	15	20	84	36	10	236	28	35	203	91
Future Volume (veh/h)	132	185	15	20	84	36	10	236	28	35	203	91
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	143	201	16	22	91	39	11	257	30	38	221	99
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	254	715	56	262	266	114	793	1119	131	751	833	373
Arrive On Green	0.21	0.21	0.21	0.07	0.07	0.07	0.68	0.68	0.68	1.00	1.00	1.00
Sat Flow, veh/h	1260	3336	263	1164	1242	532	1060	1644	192	1092	1224	548
Grp Volume(v), veh/h	143	106	111	22	0	130	11	0	287	38	0	320
Grp Sat Flow(s),veh/h/ln	1260	1777	1823	1164	0	1775	1060	0	1836	1092	0	1772
Q Serve(g_s), s	11.0	5.0	5.1	1.8	0.0	7.0	0.3	0.0	5.9	0.3	0.0	0.0
Cycle Q Clear(g_c), s	17.9	5.0	5.1	6.9	0.0	7.0	0.3	0.0	5.9	6.2	0.0	0.0
Prop In Lane	1.00		0.14	1.00		0.30	1.00		0.10	1.00		0.31
Lane Grp Cap(c), veh/h	254	381	391	262	0	380	793	0	1250	751	0	1206
V/C Ratio(X)	0.56	0.28	0.28	0.08	0.00	0.34	0.01	0.00	0.23	0.05	0.00	0.27
Avail Cap(c_a), veh/h	457	666	684	449	0	665	793	0	1250	751	0	1206
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	1.00	1.00	0.84	0.00	0.84	1.00	0.00	1.00	0.99	0.00	0.99
Uniform Delay (d), s/veh	41.3	32.8	32.9	42.1	0.0	39.8	5.1	0.0	6.0	0.3	0.0	0.0
Incr Delay (d2), s/veh	2.0	0.4	0.4	0.1	0.0	0.4	0.0	0.0	0.4	0.1	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	2.2	2.2	0.5	0.0	3.2	0.1	0.0	2.3	0.0	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.2	33.2	33.3	42.2	0.0	40.2	5.2	0.0	6.5	0.4	0.0	0.5
LnGrp LOS	D	C	C	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		360			152			298			358	
Approach Delay, s/veh		37.2			40.5			6.4			0.5	
Approach LOS		D			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		74.1		25.9		74.1		25.9				
Change Period (Y+Rc), s		6.0		4.5		6.0		4.5				
Max Green Setting (Gmax), s		52.0		37.5		52.0		37.5				
Max Q Clear Time (g_c+I1), s		7.9		19.9		8.2		9.0				
Green Ext Time (p_c), s		2.1		1.5		2.5		0.8				
Intersection Summary												
HCM 6th Ctrl Delay				18.5								
HCM 6th LOS				B								

Timing Report, Sorted By Phase

8: Northwest Boulevard & Zollinger Road

09/21/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	27	24	24	25
Maximum Split (%)	27.0%	24.0%	24.0%	25.0%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	51	27	75
End Time (s)	27	75	51	0
Yield/Force Off (s)	22	70	46	95
Yield/Force Off 170(s)	11	59	35	84
Local Start Time (s)	0	51	27	75
Local Yield (s)	22	70	46	95
Local Yield 170(s)	11	59	35	84

Intersection Summary

Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
 8: Northwest Boulevard & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	31	105	75	24	77	37	84	216	34	35	187	32
Future Volume (veh/h)	31	105	75	24	77	37	84	216	34	35	187	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	114	82	26	84	40	91	235	37	38	203	35
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	47	160	118	36	115	129	379	1031	168	92	507	91
Arrive On Green	0.09	0.09	0.09	0.08	0.08	0.08	0.44	0.44	0.44	0.06	0.06	0.06
Sat Flow, veh/h	509	1717	1263	437	1412	1585	871	2369	387	482	2670	479
Grp Volume(v), veh/h	123	0	107	110	0	40	191	0	172	146	0	130
Grp Sat Flow(s),veh/h/ln	1845	0	1643	1849	0	1585	1827	0	1801	1846	0	1784
Q Serve(g_s), s	6.5	0.0	6.3	5.8	0.0	2.4	6.6	0.0	6.0	7.6	0.0	7.0
Cycle Q Clear(g_c), s	6.5	0.0	6.3	5.8	0.0	2.4	6.6	0.0	6.0	7.6	0.0	7.0
Prop In Lane	0.28		0.77	0.24		1.00	0.48		0.21	0.26		0.27
Lane Grp Cap(c), veh/h	172	0	153	151	0	129	795	0	784	351	0	339
V/C Ratio(X)	0.72	0.00	0.70	0.73	0.00	0.31	0.24	0.00	0.22	0.42	0.00	0.38
Avail Cap(c_a), veh/h	351	0	312	370	0	317	795	0	784	351	0	339
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	0.96	0.00	0.96	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.0	0.0	44.0	44.9	0.0	43.3	17.8	0.0	17.6	41.5	0.0	41.2
Incr Delay (d2), s/veh	5.3	0.0	5.4	6.6	0.0	1.3	0.7	0.0	0.6	3.6	0.0	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	2.7	2.9	0.0	1.0	2.8	0.0	2.5	3.9	0.0	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.3	0.0	49.3	51.5	0.0	44.6	18.5	0.0	18.3	45.1	0.0	44.5
LnGrp LOS	D	A	D	D	A	D	B	A	B	D	A	D
Approach Vol, veh/h		230			150			363			276	
Approach Delay, s/veh		49.3			49.7			18.4			44.8	
Approach LOS		D			D			B			D	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.5		14.3		24.0		13.1				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		22.0		19.0		19.0		20.0				
Max Q Clear Time (g_c+I1), s		8.6		8.5		9.6		7.8				
Green Ext Time (p_c), s		1.7		0.9		1.0		0.5				
Intersection Summary												
HCM 6th Ctrl Delay				37.1								
HCM 6th LOS				D								

HCM 6th TWSC
 11: Tremont Road & Ridgecliff Road

09/21/2020

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	25	2	8	37	2	39	7	360	48	48	361	14
Future Vol, veh/h	25	2	8	37	2	39	7	360	48	48	361	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	190	-	-	290	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	2	9	40	2	42	8	391	52	52	392	15

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	959	963	400	942	944	417	407	0	0	443	0	0
Stage 1	504	504	-	433	433	-	-	-	-	-	-	-
Stage 2	455	459	-	509	511	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	237	256	650	243	262	636	1152	-	-	1117	-	-
Stage 1	550	541	-	601	582	-	-	-	-	-	-	-
Stage 2	585	566	-	547	537	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	211	242	650	228	248	636	1152	-	-	1117	-	-
Mov Cap-2 Maneuver	211	242	-	228	248	-	-	-	-	-	-	-
Stage 1	546	516	-	597	578	-	-	-	-	-	-	-
Stage 2	540	562	-	512	512	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	21.8		19.2		0.1		1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1152	-	-	252	337	1117	-
HCM Lane V/C Ratio	0.007	-	-	0.151	0.252	0.047	-
HCM Control Delay (s)	8.1	-	-	21.8	19.2	8.4	-
HCM Lane LOS	A	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	1	0.1	-

Timing Report, Sorted By Phase
 13: Tremont Road & Milden Road

09/21/2020

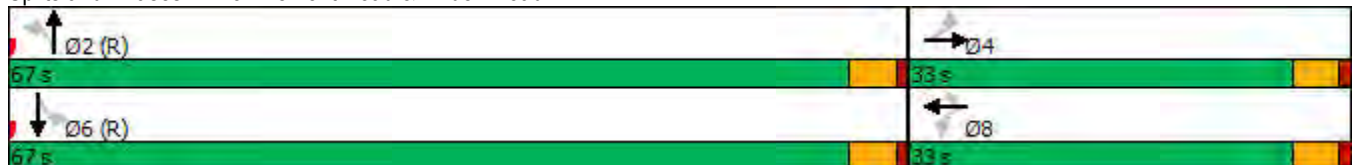


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	67	33	67	33
Maximum Split (%)	67.0%	33.0%	67.0%	33.0%
Minimum Split (s)	24.5	27.5	24.5	27.5
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	10	10	10	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	13	16	13	16
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	67	0	67
End Time (s)	67	0	67	0
Yield/Force Off (s)	62.5	95.5	62.5	95.5
Yield/Force Off 170(s)	49.5	79.5	49.5	79.5
Local Start Time (s)	0	67	0	67
Local Yield (s)	62.5	95.5	62.5	95.5
Local Yield 170(s)	49.5	79.5	49.5	79.5

Intersection Summary




















Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	55
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 13: Tremont Road & Milden Road



HCM 6th Signalized Intersection Summary
 13: Tremont Road & Milden Road

09/21/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	6	7	41	10	27	8	361	59	60	298	7
Future Volume (veh/h)	16	6	7	41	10	27	8	361	59	60	298	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	17	7	8	45	11	29	9	392	64	65	324	8
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	109	45	33	179	37	152	883	1276	208	833	1479	37
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	1.00	1.00	1.00	0.81	0.81	0.81
Sat Flow, veh/h	561	471	344	1188	386	1585	1048	1568	256	935	1817	45
Grp Volume(v), veh/h	32	0	0	56	0	29	9	0	456	65	0	332
Grp Sat Flow(s),veh/h/ln	1375	0	0	1574	0	1585	1048	0	1824	935	0	1862
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	1.4	0.0	4.0
Cycle Q Clear(g_c), s	2.9	0.0	0.0	2.9	0.0	1.7	4.1	0.0	0.0	1.4	0.0	4.0
Prop In Lane	0.53		0.25	0.80		1.00	1.00		0.14	1.00		0.02
Lane Grp Cap(c), veh/h	187	0	0	216	0	152	883	0	1485	833	0	1516
V/C Ratio(X)	0.17	0.00	0.00	0.26	0.00	0.19	0.01	0.00	0.31	0.08	0.00	0.22
Avail Cap(c_a), veh/h	472	0	0	494	0	452	883	0	1485	833	0	1516
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	1.00	0.93	0.00	0.93	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.6	0.0	0.0	42.1	0.0	41.6	0.1	0.0	0.0	1.9	0.0	2.1
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.6	0.0	0.6	0.0	0.0	0.5	0.2	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	1.3	0.0	0.7	0.0	0.0	0.2	0.2	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.0	0.0	0.0	42.8	0.0	42.2	0.1	0.0	0.5	2.0	0.0	2.4
LnGrp LOS	D	A	A	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		32			85			465			397	
Approach Delay, s/veh		42.0			42.6			0.5			2.4	
Approach LOS		D			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		85.9		14.1		85.9		14.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		62.5		28.5		62.5		28.5				
Max Q Clear Time (g_c+I1), s		6.1		4.9		6.0		4.9				
Green Ext Time (p_c), s		3.6		0.1		2.8		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				6.3								
HCM 6th LOS				A								

HCM 6th TWSC
 16: Northwest Boulevard & Trentwood Road

09/21/2020

Intersection						
Int Delay, s/veh	1.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	43	27	245	16	15	266
Future Vol, veh/h	43	27	245	16	15	266
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	47	29	266	17	16	289

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	452	142	0	0	283
Stage 1	275	-	-	-	-
Stage 2	177	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	536	880	-	-	1276
Stage 1	747	-	-	-	-
Stage 2	836	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	528	880	-	-	1276
Mov Cap-2 Maneuver	528	-	-	-	-
Stage 1	736	-	-	-	-
Stage 2	836	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	624	1276
HCM Lane V/C Ratio	-	-	0.122	0.013
HCM Control Delay (s)	-	-	11.6	7.9
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	153	695	146	68	32	97	241	9	105	180	152	36
Future Volume (vph)	153	695	146	68	32	97	241	9	105	180	152	36
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0			175		0	140		200	
Storage Lanes	1		0			1		0	1		2	
Taper Length (ft)	25					25			25			
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt		0.965					0.994				0.850	0.850
Flt Protected	0.950					0.950			0.950			
Satd. Flow (prot)	1770	3415	0	0	0	1770	3518	0	1770	1863	1583	1583
Flt Permitted	0.438					0.132			0.471			
Satd. Flow (perm)	816	3415	0	0	0	246	3518	0	877	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												242
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			455		
Travel Time (s)		22.6					18.2			12.4		
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
Adj. Flow (vph)	166	755	159	74	35	105	262	10	114	196	165	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	166	988	0	0	0	140	272	0	114	196	165	39
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA			Perm	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2				1	6		7	4		
Permitted Phases	2				6	6			4		4	Free
Minimum Split (s)	10.5	36.0			30.0	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	17.7	43.0			36.3	11.0	36.3		10.5	33.5	33.5	
Total Split (%)	12.6%	30.7%			25.9%	7.9%	25.9%		7.5%	23.9%	23.9%	
Maximum Green (s)	12.2	37.0			30.3	5.5	30.3		5.0	27.5	27.5	
Yellow Time (s)	3.5	4.0			4.0	3.5	4.0		3.5	4.0	4.0	
All-Red Time (s)	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	
Total Lost Time (s)	5.5	6.0				5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag			Lag	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0			10.0		10.0			10.0	10.0	
Flash Dont Walk (s)		20.0			14.0		14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0			0	0	
Act Effct Green (s)	48.5	37.0				36.3	30.3		33.0	27.5	27.5	140.0
Actuated g/C Ratio	0.35	0.26				0.26	0.22		0.24	0.20	0.20	1.00
v/c Ratio	0.45	1.10				1.14	0.36		0.48	0.54	0.53	0.02

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	73	159	233	99	1	156	76	81
Future Volume (vph)	73	159	233	99	1	156	76	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.380				0.950		
Satd. Flow (perm)	0	708	1863	1583	0	3433	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				109				242
Link Speed (mph)			35			35		
Link Distance (ft)			1258			336		
Travel Time (s)			24.5			6.5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	173	253	108	1	170	83	88
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	252	253	108	0	171	83	88
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	16.0	16.0	39.0	17.7	36.5	36.5	36.5	
Total Split (%)	11.4%	11.4%	27.9%	12.6%	26.1%	26.1%	26.1%	
Maximum Green (s)	10.5	10.5	33.0	12.2	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		44.0	33.0	45.7		31.0	31.0	140.0
Actuated g/C Ratio		0.31	0.24	0.33		0.22	0.22	1.00
v/c Ratio		0.83	0.58	0.18		0.23	0.24	0.06

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020

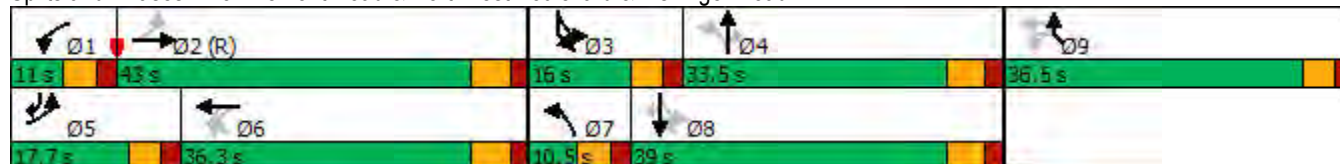


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Control Delay	37.6	107.0				159.6	48.2		46.5	56.7	57.6	0.0
Queue Delay	0.0	0.0				0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	37.6	107.0				159.6	48.2		46.5	56.7	57.6	0.0
LOS	D	F				F	D		D	E	E	A
Approach Delay		97.0					86.0			50.5		
Approach LOS		F					F			D		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	145
Control Type:	Pretimed
Maximum v/c Ratio:	1.14
Intersection Signal Delay:	70.9
Intersection LOS:	E
Intersection Capacity Utilization	85.1%
ICU Level of Service	E
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		64.4	53.4	3.6		45.6	47.0	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		64.4	53.4	3.6		45.6	47.0	0.1
LOS		E	D	A		D	D	A
Approach Delay		49.2				34.2		
Approach LOS		D				C		
Intersection Summary								

Lanes, Volumes, Timings

18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	77	49	87	183	190	106
Future Volume (vph)	77	49	87	183	190	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110	110	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Frt		0.850			0.946	
Flt Protected	0.950			0.984		
Satd. Flow (prot)	1770	1583	0	3483	3348	0
Flt Permitted	0.950			0.753		
Satd. Flow (perm)	1770	1583	0	2665	3348	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		53			115	
Link Speed (mph)	25			35	35	
Link Distance (ft)	368			1084	517	
Travel Time (s)	10.0			21.1	10.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	84	53	95	199	207	115
Shared Lane Traffic (%)						
Lane Group Flow (vph)	84	53	0	294	322	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			

Lanes, Volumes, Timings
 18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020

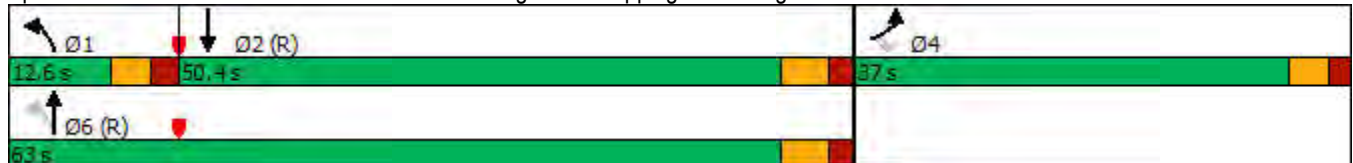


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	1	6	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0	7.0	10.0	10.0	
Minimum Split (s)	26.8	26.8	12.6	27.6	35.6	
Total Split (s)	37.0	37.0	12.6	63.0	50.4	
Total Split (%)	37.0%	37.0%	12.6%	63.0%	50.4%	
Maximum Green (s)	32.2	32.2	7.6	57.4	44.8	
Yellow Time (s)	3.0	3.0	3.0	3.6	3.6	
All-Red Time (s)	1.8	1.8	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.8	4.8		5.6	5.6	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effect Green (s)	10.5	10.5		82.8	82.8	
Actuated g/C Ratio	0.10	0.10		0.83	0.83	
v/c Ratio	0.45	0.25		0.13	0.12	
Control Delay	49.4	14.2		7.8	1.7	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	49.4	14.2		7.8	1.7	
LOS	D	B		A	A	
Approach Delay	35.8			7.8	1.7	
Approach LOS	D			A	A	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.45
 Intersection Signal Delay: 10.3
 Intersection LOS: B
 Intersection Capacity Utilization 37.0%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 18: Northwest Boulevard & Kingsdale Shopping Center Signal



Timing Report, Sorted By Phase

7: Tremont Road & Zollinger Road

09/21/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	70	50	70	50
Maximum Split (%)	58.3%	41.7%	58.3%	41.7%
Minimum Split (s)	42	29.5	42	29.5
Yellow Time (s)	4	3.5	4	3.5
All-Red Time (s)	2	1	2	1
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	12	8	12	8
Flash Dont Walk (s)	24	17	24	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	70	0	70
End Time (s)	70	0	70	0
Yield/Force Off (s)	64	115.5	64	115.5
Yield/Force Off 170(s)	40	98.5	40	98.5
Local Start Time (s)	0	70	0	70
Local Yield (s)	64	115.5	64	115.5
Local Yield 170(s)	40	98.5	40	98.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 7: Tremont Road & Zollinger Road



HCM 6th Signalized Intersection Summary
7: Tremont Road & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (veh/h)	91	161	45	52	191	54	35	302	41	32	278	96
Future Volume (veh/h)	91	161	45	52	191	54	35	302	41	32	278	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	99	175	49	57	208	59	38	328	45	35	302	104
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	188	711	194	298	361	102	701	1054	145	632	871	300
Arrive On Green	0.26	0.26	0.26	0.09	0.09	0.09	0.65	0.65	0.65	1.00	1.00	1.00
Sat Flow, veh/h	1112	2760	752	1157	1401	397	979	1610	221	1009	1330	458
Grp Volume(v), veh/h	99	111	113	57	0	267	38	0	373	35	0	406
Grp Sat Flow(s),veh/h/ln	1112	1777	1735	1157	0	1799	979	0	1831	1009	0	1788
Q Serve(g_s), s	10.4	5.9	6.2	5.6	0.0	17.1	1.7	0.0	10.6	0.6	0.0	0.0
Cycle Q Clear(g_c), s	27.5	5.9	6.2	11.8	0.0	17.1	1.7	0.0	10.6	11.2	0.0	0.0
Prop In Lane	1.00		0.43	1.00		0.22	1.00		0.12	1.00		0.26
Lane Grp Cap(c), veh/h	188	458	447	298	0	464	701	0	1199	632	0	1171
V/C Ratio(X)	0.53	0.24	0.25	0.19	0.00	0.58	0.05	0.00	0.31	0.06	0.00	0.35
Avail Cap(c_a), veh/h	323	674	658	439	0	682	701	0	1199	632	0	1171
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	1.00	1.00	0.70	0.00	0.70	1.00	0.00	1.00	0.97	0.00	0.97
Uniform Delay (d), s/veh	51.6	35.3	35.4	49.1	0.0	48.6	7.4	0.0	9.0	0.8	0.0	0.0
Incr Delay (d2), s/veh	2.3	0.3	0.3	0.2	0.0	0.8	0.1	0.0	0.7	0.2	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	2.6	2.7	1.8	0.0	8.4	0.4	0.0	4.4	0.0	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.9	35.5	35.7	49.3	0.0	49.4	7.6	0.0	9.7	0.9	0.0	0.8
LnGrp LOS	D	D	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		323			324			411				441
Approach Delay, s/veh		41.2			49.4			9.5				0.8
Approach LOS		D			D			A				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		84.6		35.4		84.6		35.4				
Change Period (Y+Rc), s		6.0		4.5		6.0		4.5				
Max Green Setting (Gmax), s		64.0		45.5		64.0		45.5				
Max Q Clear Time (g_c+I1), s		12.6		29.5		13.2		19.1				
Green Ext Time (p_c), s		3.0		1.4		3.3		1.8				
Intersection Summary												
HCM 6th Ctrl Delay				22.4								
HCM 6th LOS				C								

Timing Report, Sorted By Phase

8: Northwest Boulevard & Zollinger Road

09/21/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	36	27	30	27
Maximum Split (%)	30.0%	22.5%	25.0%	22.5%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	66	36	93
End Time (s)	36	93	66	0
Yield/Force Off (s)	31	88	61	115
Yield/Force Off 170(s)	20	77	50	104
Local Start Time (s)	0	66	36	93
Local Yield (s)	31	88	61	115
Local Yield 170(s)	20	77	50	104

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
 8: Northwest Boulevard & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	56	162	93	16	128	68	85	261	53	57	245	63
Future Volume (veh/h)	56	162	93	16	128	68	85	261	53	57	245	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	176	101	17	139	74	92	284	58	62	266	68
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	77	226	135	21	173	166	291	940	200	113	502	134
Arrive On Green	0.04	0.04	0.04	0.10	0.10	0.10	0.40	0.40	0.40	0.07	0.07	0.07
Sat Flow, veh/h	618	1815	1082	203	1658	1585	735	2373	505	543	2412	643
Grp Volume(v), veh/h	182	0	156	156	0	74	229	0	205	211	0	185
Grp Sat Flow(s),veh/h/ln	1839	0	1676	1860	0	1585	1834	0	1780	1843	0	1755
Q Serve(g_s), s	11.7	0.0	11.1	9.8	0.0	5.3	10.4	0.0	9.4	13.3	0.0	12.2
Cycle Q Clear(g_c), s	11.7	0.0	11.1	9.8	0.0	5.3	10.4	0.0	9.4	13.3	0.0	12.2
Prop In Lane	0.34		0.65	0.11		1.00	0.40		0.28	0.29		0.37
Lane Grp Cap(c), veh/h	229	0	208	194	0	166	726	0	705	384	0	366
V/C Ratio(X)	0.79	0.00	0.75	0.80	0.00	0.45	0.32	0.00	0.29	0.55	0.00	0.51
Avail Cap(c_a), veh/h	337	0	307	341	0	291	726	0	705	384	0	366
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	0.97	0.00	0.97	1.00	0.00	1.00	1.00	0.00	1.00	0.99	0.00	0.99
Uniform Delay (d), s/veh	56.0	0.0	55.7	52.5	0.0	50.5	25.0	0.0	24.7	50.4	0.0	49.9
Incr Delay (d2), s/veh	7.5	0.0	5.5	7.5	0.0	1.9	1.1	0.0	1.0	5.5	0.0	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	0.0	5.3	5.0	0.0	2.2	4.7	0.0	4.1	7.2	0.0	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.5	0.0	61.2	60.0	0.0	52.4	26.1	0.0	25.8	55.9	0.0	54.8
LnGrp LOS	E	A	E	E	A	D	C	A	C	E	A	D
Approach Vol, veh/h		338			230			434			396	
Approach Delay, s/veh		62.5			57.6			26.0			55.4	
Approach LOS		E			E			C			E	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		52.5		19.9		30.0		17.5				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		31.0		22.0		25.0		22.0				
Max Q Clear Time (g_c+I1), s		12.4		13.7		15.3		11.8				
Green Ext Time (p_c), s		2.3		1.2		1.6		0.7				
Intersection Summary												
HCM 6th Ctrl Delay				48.3								
HCM 6th LOS				D								

HCM 6th TWSC
 11: Tremont Road & Ridgecliff Road

09/21/2020

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	12	15	420	396	33
Future Vol, veh/h	21	12	15	420	396	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	190	-	-	-
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	23	13	16	457	430	36

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	937	448	466	0	-	0
Stage 1	448	-	-	-	-	-
Stage 2	489	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	294	611	1095	-	-	-
Stage 1	644	-	-	-	-	-
Stage 2	616	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	290	611	1095	-	-	-
Mov Cap-2 Maneuver	290	-	-	-	-	-
Stage 1	634	-	-	-	-	-
Stage 2	616	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.2	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1095	-	358	-	-
HCM Lane V/C Ratio	0.015	-	0.1	-	-
HCM Control Delay (s)	8.3	-	16.2	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Timing Report, Sorted By Phase
 13: Tremont Road & Milden Road

09/21/2020

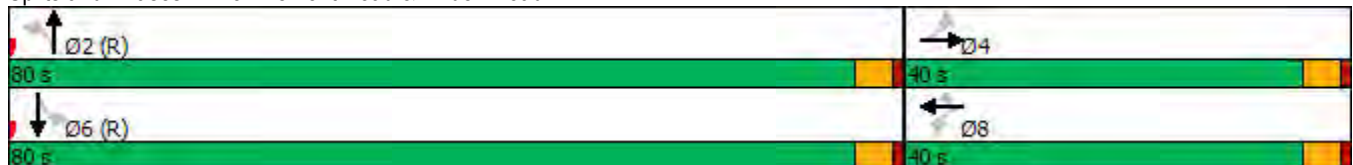


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	80	40	80	40
Maximum Split (%)	66.7%	33.3%	66.7%	33.3%
Minimum Split (s)	24.5	27.5	24.5	27.5
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	10	10	10	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	13	16	13	16
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	80	0	80
End Time (s)	80	0	80	0
Yield/Force Off (s)	75.5	115.5	75.5	115.5
Yield/Force Off 170(s)	62.5	99.5	62.5	99.5
Local Start Time (s)	0	80	0	80
Local Yield (s)	75.5	115.5	75.5	115.5
Local Yield 170(s)	62.5	99.5	62.5	99.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	55
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 13: Tremont Road & Milden Road



HCM 6th Signalized Intersection Summary
 13: Tremont Road & Milden Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	28	15	6	61	23	84	13	310	86	91	351	14
Future Volume (veh/h)	28	15	6	61	23	84	13	310	86	91	351	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	30	16	7	66	25	91	14	337	93	99	382	15
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	78	37	10	147	46	162	825	1161	320	848	1470	58
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	1.00	1.00	1.00	0.82	0.82	0.82
Sat Flow, veh/h	308	361	102	935	446	1585	987	1411	389	958	1788	70
Grp Volume(v), veh/h	53	0	0	91	0	91	14	0	430	99	0	397
Grp Sat Flow(s),veh/h/ln	770	0	0	1381	0	1585	987	0	1800	958	0	1858
Q Serve(g_s), s	2.4	0.0	0.0	0.0	0.0	6.6	0.1	0.0	0.0	2.5	0.0	5.8
Cycle Q Clear(g_c), s	10.1	0.0	0.0	7.7	0.0	6.6	5.9	0.0	0.0	2.5	0.0	5.8
Prop In Lane	0.57		0.13	0.73		1.00	1.00		0.22	1.00		0.04
Lane Grp Cap(c), veh/h	126	0	0	193	0	162	825	0	1481	848	0	1528
V/C Ratio(X)	0.42	0.00	0.00	0.47	0.00	0.56	0.02	0.00	0.29	0.12	0.00	0.26
Avail Cap(c_a), veh/h	407	0	0	482	0	469	825	0	1481	848	0	1528
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	1.00	0.90	0.00	0.90	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.1	0.0	0.0	51.7	0.0	51.3	0.2	0.0	0.0	2.1	0.0	2.4
Incr Delay (d2), s/veh	2.2	0.0	0.0	1.8	0.0	3.0	0.0	0.0	0.4	0.3	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.0	2.8	0.0	2.8	0.0	0.0	0.2	0.4	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.3	0.0	0.0	53.5	0.0	54.3	0.2	0.0	0.4	2.4	0.0	2.8
LnGrp LOS	E	A	A	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		53			182			444			496	
Approach Delay, s/veh		55.3			53.9			0.4			2.7	
Approach LOS		E			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		103.2		16.8		103.2		16.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		75.5		35.5		75.5		35.5				
Max Q Clear Time (g_c+I1), s		7.9		12.1		7.8		9.7				
Green Ext Time (p_c), s		3.4		0.2		3.6		0.8				
Intersection Summary												
HCM 6th Ctrl Delay				12.2								
HCM 6th LOS				B								

HCM 6th TWSC
 16: Northwest Boulevard & Trentwood Road

09/21/2020

Intersection						
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑			↑↑
Traffic Vol, veh/h	39	25	421	35	20	339
Future Vol, veh/h	39	25	421	35	20	339
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	42	27	458	38	22	368

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	705	248	0	0	496
Stage 1	477	-	-	-	-
Stage 2	228	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	371	752	-	-	1064
Stage 1	590	-	-	-	-
Stage 2	788	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	361	752	-	-	1064
Mov Cap-2 Maneuver	361	-	-	-	-
Stage 1	575	-	-	-	-
Stage 2	788	-	-	-	-

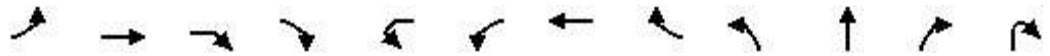
Approach	WB	NB	SB
HCM Control Delay, s	14.4	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	453	1064
HCM Lane V/C Ratio	-	-	0.154	0.02
HCM Control Delay (s)	-	-	14.4	8.5
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	97	236	144	68	68	137	542	9	163	213	71	18
Future Volume (vph)	97	236	144	68	68	137	542	9	163	213	71	18
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0			175		0	140		200	
Storage Lanes	1		0			1		0	1		2	
Taper Length (ft)	25					25			25			
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt		0.929					0.997				0.850	0.850
Flt Protected	0.950					0.950			0.950			
Satd. Flow (prot)	1770	3288	0	0	0	1770	3529	0	1770	1863	1583	1583
Flt Permitted	0.265					0.264			0.520			
Satd. Flow (perm)	494	3288	0	0	0	492	3529	0	969	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												199
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			420		
Travel Time (s)		22.6					18.2			11.5		
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
Adj. Flow (vph)	105	257	157	74	74	149	589	10	177	232	77	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	488	0	0	0	223	599	0	177	232	77	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA			Perm	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2				1	6		7	4		
Permitted Phases	2				6	6			4		4	Free
Minimum Split (s)	10.5	36.0			30.0	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	12.0	38.0			42.0	16.0	42.0		10.5	34.3	34.3	
Total Split (%)	8.6%	27.1%			30.0%	11.4%	30.0%		7.5%	24.5%	24.5%	
Maximum Green (s)	6.5	32.0			36.0	10.5	36.0		5.0	28.3	28.3	
Yellow Time (s)	3.5	4.0			4.0	3.5	4.0		3.5	4.0	4.0	
All-Red Time (s)	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	
Total Lost Time (s)	5.5	6.0				5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag			Lag	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0			10.0		10.0			10.0	10.0	
Flash Dont Walk (s)		20.0			14.0		14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0			0	0	
Act Effct Green (s)	39.0	32.0				47.0	36.0		33.8	28.3	28.3	140.0
Actuated g/C Ratio	0.28	0.23				0.34	0.26		0.24	0.20	0.20	1.00
v/c Ratio	0.54	0.65				0.85	0.66		0.68	0.62	0.24	0.01

OY PM No Build

Synchro 10 Report

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	21	110	206	143	6	239	81	118
Future Volume (vph)	21	110	206	143	6	239	81	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.331				0.950		
Satd. Flow (perm)	0	617	1863	1583	0	3433	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				144				199
Link Speed (mph)			35			35		
Link Distance (ft)			1258			367		
Travel Time (s)			24.5			7.1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	120	224	155	7	260	88	128
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	143	224	155	0	267	88	128
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	15.2	15.2	39.0	12.0	36.5	36.5	36.5	
Total Split (%)	10.9%	10.9%	27.9%	8.6%	26.1%	26.1%	26.1%	
Maximum Green (s)	9.7	9.7	33.0	6.5	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		43.2	33.0	40.0		31.0	31.0	140.0
Actuated g/C Ratio		0.31	0.24	0.29		0.22	0.22	1.00
v/c Ratio		0.53	0.51	0.28		0.35	0.25	0.08

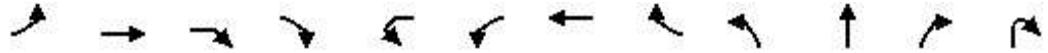
OY PM No Build

Synchro 10 Report

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020

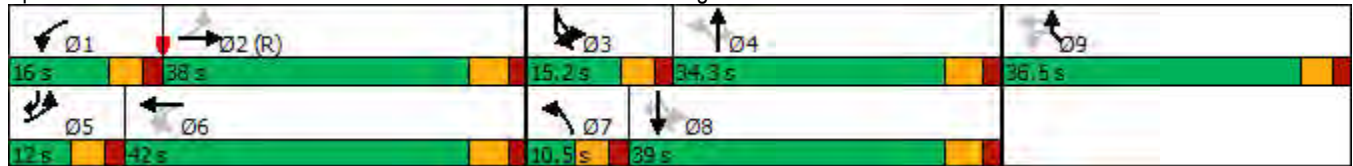


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Control Delay	44.5	53.6				66.0	50.7		57.1	59.0	49.3	0.0
Queue Delay	0.0	0.0				0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	44.5	53.6				66.0	50.7		57.1	59.0	49.3	0.0
LOS	D	D				E	D		E	E	D	A
Approach Delay		52.0					54.8			54.5		
Approach LOS		D					D			D		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	135
Control Type:	Pretimed
Maximum v/c Ratio:	0.85
Intersection Signal Delay:	47.5
Intersection LOS:	D
Intersection Capacity Utilization	75.3%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		44.0	51.3	4.9		47.6	47.3	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		44.0	51.3	4.9		47.6	47.3	0.1
LOS		D	D	A		D	D	A
Approach Delay			35.5			34.9		
Approach LOS			D			C		
Intersection Summary								

Lanes, Volumes, Timings

18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	146	31	76	307	240	129
Future Volume (vph)	146	31	76	307	240	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110	110	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Frt		0.850			0.948	
Flt Protected	0.950			0.990		
Satd. Flow (prot)	1770	1583	0	3504	3355	0
Flt Permitted	0.950			0.783		
Satd. Flow (perm)	1770	1583	0	2771	3355	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		34			105	
Link Speed (mph)	25			35	35	
Link Distance (ft)	368			1084	508	
Travel Time (s)	10.0			21.1	9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	159	34	83	334	261	140
Shared Lane Traffic (%)						
Lane Group Flow (vph)	159	34	0	417	401	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			

OY PM No Build

Synchro 10 Report

Lanes, Volumes, Timings
 18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020

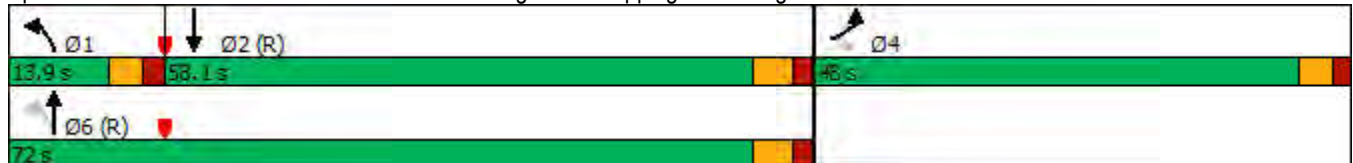


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	1	6	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0	7.0	10.0	10.0	
Minimum Split (s)	26.8	26.8	12.6	27.6	35.6	
Total Split (s)	48.0	48.0	13.9	72.0	58.1	
Total Split (%)	40.0%	40.0%	11.6%	60.0%	48.4%	
Maximum Green (s)	43.2	43.2	8.9	66.4	52.5	
Yellow Time (s)	3.0	3.0	3.0	3.6	3.6	
All-Red Time (s)	1.8	1.8	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.8	4.8		5.6	5.6	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effect Green (s)	16.2	16.2		93.4	93.4	
Actuated g/C Ratio	0.14	0.14		0.78	0.78	
v/c Ratio	0.67	0.14		0.19	0.15	
Control Delay	62.3	14.8		12.4	2.9	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	62.3	14.8		12.4	2.9	
LOS	E	B		B	A	
Approach Delay	53.9			12.4	2.9	
Approach LOS	D			B	A	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.67
 Intersection Signal Delay: 16.6
 Intersection LOS: B
 Intersection Capacity Utilization 42.9%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 18: Northwest Boulevard & Kingsdale Shopping Center Signal



Timing Report, Sorted By Phase

7: Tremont Road & Zollinger Road

09/21/2020

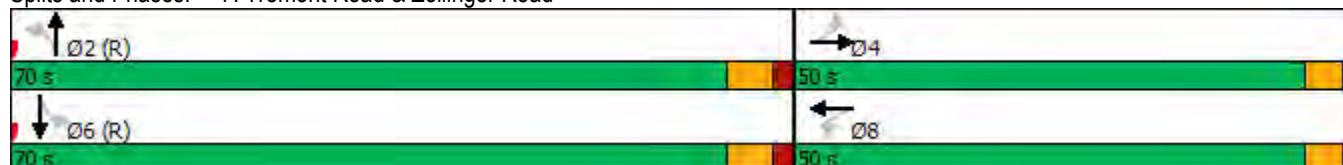


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	70	50	70	50
Maximum Split (%)	58.3%	41.7%	58.3%	41.7%
Minimum Split (s)	42	29.5	42	29.5
Yellow Time (s)	4	3.5	4	3.5
All-Red Time (s)	2	1	2	1
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	12	8	12	8
Flash Dont Walk (s)	24	17	24	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	70	0	70
End Time (s)	70	0	70	0
Yield/Force Off (s)	64	115.5	64	115.5
Yield/Force Off 170(s)	40	98.5	40	98.5
Local Start Time (s)	0	70	0	70
Local Yield (s)	64	115.5	64	115.5
Local Yield 170(s)	40	98.5	40	98.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 7: Tremont Road & Zollinger Road



HCM 6th Signalized Intersection Summary
 7: Tremont Road & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↶↷		↶	↷		↶	↷		↶	↷	
Traffic Volume (veh/h)	127	161	45	52	191	54	35	340	41	32	316	132
Future Volume (veh/h)	127	161	45	52	191	54	35	340	41	32	316	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	138	175	49	57	208	59	38	370	45	35	343	143
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	226	800	218	338	406	115	626	1018	124	557	780	325
Arrive On Green	0.29	0.29	0.29	0.10	0.10	0.10	0.62	0.62	0.62	1.00	1.00	1.00
Sat Flow, veh/h	1112	2760	752	1157	1401	397	910	1636	199	971	1254	523
Grp Volume(v), veh/h	138	111	113	57	0	267	38	0	415	35	0	486
Grp Sat Flow(s),veh/h/ln	1112	1777	1735	1157	0	1799	910	0	1835	971	0	1776
Q Serve(g_s), s	14.5	5.7	5.9	5.5	0.0	16.9	2.0	0.0	13.2	0.8	0.0	0.0
Cycle Q Clear(g_c), s	31.4	5.7	5.9	11.5	0.0	16.9	2.0	0.0	13.2	14.1	0.0	0.0
Prop In Lane	1.00		0.43	1.00		0.22	1.00		0.11	1.00		0.29
Lane Grp Cap(c), veh/h	226	515	503	338	0	522	626	0	1142	557	0	1106
V/C Ratio(X)	0.61	0.22	0.22	0.17	0.00	0.51	0.06	0.00	0.36	0.06	0.00	0.44
Avail Cap(c_a), veh/h	325	674	658	441	0	682	626	0	1142	557	0	1106
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	1.00	1.00	0.70	0.00	0.70	1.00	0.00	1.00	0.96	0.00	0.96
Uniform Delay (d), s/veh	49.6	32.3	32.4	46.5	0.0	46.2	8.9	0.0	11.0	1.2	0.0	0.0
Incr Delay (d2), s/veh	2.7	0.2	0.2	0.2	0.0	0.5	0.2	0.0	0.9	0.2	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	2.5	2.5	1.7	0.0	8.3	0.4	0.0	5.6	0.1	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.3	32.5	32.6	46.7	0.0	46.7	9.1	0.0	11.9	1.5	0.0	1.2
LnGrp LOS	D	C	C	D	A	D	A	A	B	A	A	A
Approach Vol, veh/h		362			324			453			521	
Approach Delay, s/veh		40.1			46.7			11.7			1.2	
Approach LOS		D			D			B			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		80.7		39.3		80.7		39.3				
Change Period (Y+Rc), s		6.0		4.5		6.0		4.5				
Max Green Setting (Gmax), s		64.0		45.5		64.0		45.5				
Max Q Clear Time (g_c+I1), s		15.2		33.4		16.1		18.9				
Green Ext Time (p_c), s		3.4		1.4		4.1		1.8				
Intersection Summary												
HCM 6th Ctrl Delay				21.4								
HCM 6th LOS				C								

Timing Report, Sorted By Phase
 8: Northwest Boulevard & Zollinger Road

09/21/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	36	26	31	27
Maximum Split (%)	30.0%	21.7%	25.8%	22.5%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	67	36	93
End Time (s)	36	93	67	0
Yield/Force Off (s)	31	88	62	115
Yield/Force Off 170(s)	20	77	51	104
Local Start Time (s)	0	67	36	93
Local Yield (s)	31	88	62	115
Local Yield 170(s)	20	77	51	104

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
 8: Northwest Boulevard & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	56	162	93	16	128	88	85	302	53	76	286	63
Future Volume (veh/h)	56	162	93	16	128	88	85	302	53	76	286	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	176	101	17	139	96	92	328	58	83	311	68
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	76	224	134	21	174	166	260	969	179	135	527	120
Arrive On Green	0.04	0.04	0.04	0.10	0.10	0.10	0.39	0.39	0.39	0.07	0.07	0.07
Sat Flow, veh/h	618	1815	1082	203	1658	1585	669	2496	460	623	2432	555
Grp Volume(v), veh/h	182	0	156	156	0	96	253	0	225	245	0	217
Grp Sat Flow(s),veh/h/ln	1839	0	1676	1860	0	1585	1837	0	1788	1839	0	1770
Q Serve(g_s), s	11.7	0.0	11.1	9.8	0.0	6.9	11.7	0.0	10.6	15.5	0.0	14.2
Cycle Q Clear(g_c), s	11.7	0.0	11.1	9.8	0.0	6.9	11.7	0.0	10.6	15.5	0.0	14.2
Prop In Lane	0.34		0.65	0.11		1.00	0.36		0.26	0.34		0.31
Lane Grp Cap(c), veh/h	227	0	207	195	0	166	713	0	694	398	0	384
V/C Ratio(X)	0.80	0.00	0.76	0.80	0.00	0.58	0.35	0.00	0.32	0.62	0.00	0.57
Avail Cap(c_a), veh/h	322	0	293	341	0	291	713	0	694	398	0	384
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	0.97	0.00	0.97	1.00	0.00	1.00	1.00	0.00	1.00	0.99	0.00	0.99
Uniform Delay (d), s/veh	56.1	0.0	55.8	52.5	0.0	51.2	26.0	0.0	25.7	50.8	0.0	50.2
Incr Delay (d2), s/veh	8.8	0.0	6.6	7.3	0.0	3.1	1.4	0.0	1.2	6.9	0.0	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	5.4	5.0	0.0	2.9	5.3	0.0	4.7	8.4	0.0	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.9	0.0	62.4	59.8	0.0	54.3	27.4	0.0	26.9	57.7	0.0	56.1
LnGrp LOS	E	A	E	E	A	D	C	A	C	E	A	E
Approach Vol, veh/h		338			252			478				462
Approach Delay, s/veh		63.7			57.7			27.2				57.0
Approach LOS		E			E			C				E
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		51.6		19.8		31.0		17.6				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		31.0		21.0		26.0		22.0				
Max Q Clear Time (g_c+I1), s		13.7		13.7		17.5		11.8				
Green Ext Time (p_c), s		2.6		1.1		1.7		0.8				
Intersection Summary												
HCM 6th Ctrl Delay				49.3								
HCM 6th LOS				D								

HCM 6th TWSC
 11: Tremont Road & Ridgecliff Road

09/21/2020

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	21	2	12	50	2	54	15	418	52	56	394	33
Future Vol, veh/h	21	2	12	50	2	54	15	418	52	56	394	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	190	-	-	290	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	2	13	54	2	59	16	454	57	61	428	36

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1113	1111	446	1091	1101	483	464	0	0	511	0	0
Stage 1	568	568	-	515	515	-	-	-	-	-	-	-
Stage 2	545	543	-	576	586	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	186	209	612	192	212	584	1097	-	-	1054	-	-
Stage 1	508	506	-	543	535	-	-	-	-	-	-	-
Stage 2	523	520	-	503	497	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	157	194	612	176	197	584	1097	-	-	1054	-	-
Mov Cap-2 Maneuver	157	194	-	176	197	-	-	-	-	-	-	-
Stage 1	500	477	-	535	527	-	-	-	-	-	-	-
Stage 2	462	512	-	462	468	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	25.4		27.3		0.3		1	
HCM LOS	D		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1097	-	-	214	274	1054	-
HCM Lane V/C Ratio	0.015	-	-	0.178	0.421	0.058	-
HCM Control Delay (s)	8.3	-	-	25.4	27.3	8.6	-
HCM Lane LOS	A	-	-	D	D	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	2	0.2	-

Timing Report, Sorted By Phase
 13: Tremont Road & Milden Road

09/21/2020

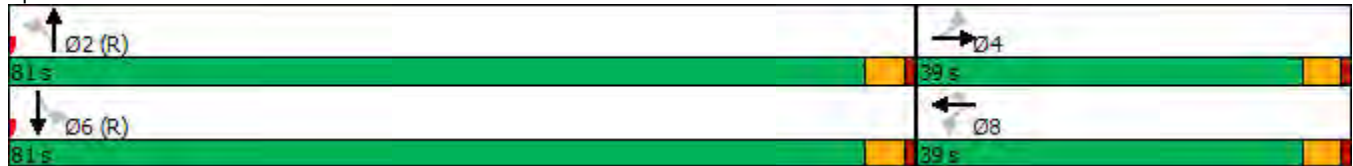


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	81	39	81	39
Maximum Split (%)	67.5%	32.5%	67.5%	32.5%
Minimum Split (s)	24.5	27.5	24.5	27.5
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	10	10	10	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	13	16	13	16
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	81	0	81
End Time (s)	81	0	81	0
Yield/Force Off (s)	76.5	115.5	76.5	115.5
Yield/Force Off 170(s)	63.5	99.5	63.5	99.5
Local Start Time (s)	0	81	0	81
Local Yield (s)	76.5	115.5	76.5	115.5
Local Yield 170(s)	63.5	99.5	63.5	99.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	55
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 13: Tremont Road & Milden Road



HCM 6th Signalized Intersection Summary
 13: Tremont Road & Milden Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	30	15	6	87	25	84	13	358	112	91	399	14
Future Volume (veh/h)	30	15	6	87	25	84	13	358	112	91	399	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	16	7	95	27	91	14	389	122	99	434	15
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	83	36	10	186	40	214	741	1079	338	762	1420	49
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	1.00	1.00	1.00	0.79	0.79	0.79
Sat Flow, veh/h	263	265	75	986	298	1585	941	1365	428	889	1797	62
Grp Volume(v), veh/h	56	0	0	122	0	91	14	0	511	99	0	449
Grp Sat Flow(s),veh/h/ln	604	0	0	1284	0	1585	941	0	1793	889	0	1859
Q Serve(g_s), s	2.8	0.0	0.0	0.0	0.0	6.3	0.2	0.0	0.0	3.2	0.0	8.0
Cycle Q Clear(g_c), s	14.0	0.0	0.0	11.2	0.0	6.3	8.2	0.0	0.0	3.2	0.0	8.0
Prop In Lane	0.59		0.12	0.78		1.00	1.00		0.24	1.00		0.03
Lane Grp Cap(c), veh/h	129	0	0	227	0	214	741	0	1417	762	0	1469
V/C Ratio(X)	0.43	0.00	0.00	0.54	0.00	0.43	0.02	0.00	0.36	0.13	0.00	0.31
Avail Cap(c_a), veh/h	349	0	0	451	0	456	741	0	1417	762	0	1469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.83	0.00	0.83	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.9	0.0	0.0	49.7	0.0	47.6	0.3	0.0	0.0	3.0	0.0	3.5
Incr Delay (d2), s/veh	2.3	0.0	0.0	2.0	0.0	1.3	0.0	0.0	0.6	0.4	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	0.0	3.7	0.0	2.6	0.0	0.0	0.2	0.6	0.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.2	0.0	0.0	51.7	0.0	49.0	0.4	0.0	0.6	3.3	0.0	4.0
LnGrp LOS	D	A	A	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		56			213			525			548	
Approach Delay, s/veh		54.2			50.5			0.6			3.9	
Approach LOS		D			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		99.3		20.7		99.3		20.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		76.5		34.5		76.5		34.5				
Max Q Clear Time (g_c+I1), s		10.2		16.0		10.0		13.2				
Green Ext Time (p_c), s		4.3		0.2		4.2		0.9				
Intersection Summary												
HCM 6th Ctrl Delay				12.1								
HCM 6th LOS				B								

HCM 6th TWSC
16: Northwest Boulevard & Trentwood Road

09/21/2020

Intersection						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	46	25	466	42	20	382
Future Vol, veh/h	46	25	466	42	20	382
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	50	27	507	46	22	415

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	782	277	0	0	553
Stage 1	530	-	-	-	-
Stage 2	252	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	331	720	-	-	1013
Stage 1	555	-	-	-	-
Stage 2	767	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	322	720	-	-	1013
Mov Cap-2 Maneuver	322	-	-	-	-
Stage 1	539	-	-	-	-
Stage 2	767	-	-	-	-

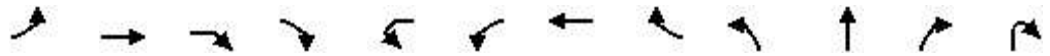
Approach	WB	NB	SB
HCM Control Delay, s	16.1	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	400	1013
HCM Lane V/C Ratio	-	-	0.193	0.021
HCM Control Delay (s)	-	-	16.1	8.6
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	97	234	163	80	75	153	540	9	175	239	71	32
Future Volume (vph)	97	234	163	80	75	153	540	9	175	239	71	32
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0			175		0	140		200	
Storage Lanes	1		0			1		0	1		2	
Taper Length (ft)	25					25			25			
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt		0.924					0.997				0.850	0.850
Flt Protected	0.950					0.950			0.950			
Satd. Flow (prot)	1770	3270	0	0	0	1770	3529	0	1770	1863	1583	1583
Flt Permitted	0.216					0.236			0.431			
Satd. Flow (perm)	402	3270	0	0	0	440	3529	0	803	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												199
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			442		
Travel Time (s)		22.6					18.2			12.1		
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
Adj. Flow (vph)	105	254	177	87	82	166	587	10	190	260	77	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	518	0	0	0	248	597	0	190	260	77	35
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA			Perm	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2				1	6		7	4		
Permitted Phases	2				6	6			4		4	Free
Minimum Split (s)	10.5	36.0			30.0	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	15.2	36.1			38.1	17.2	38.1		11.2	36.2	36.2	
Total Split (%)	10.9%	25.8%			27.2%	12.3%	27.2%		8.0%	25.9%	25.9%	
Maximum Green (s)	9.7	30.1			32.1	11.7	32.1		5.7	30.2	30.2	
Yellow Time (s)	3.5	4.0			4.0	3.5	4.0		3.5	4.0	4.0	
All-Red Time (s)	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	
Total Lost Time (s)	5.5	6.0				5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag			Lag	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0			10.0		10.0			10.0	10.0	
Flash Dont Walk (s)		20.0			14.0		14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0			0	0	
Act Effct Green (s)	40.3	30.1				44.3	32.1		36.4	30.2	30.2	140.0
Actuated g/C Ratio	0.29	0.22				0.32	0.23		0.26	0.22	0.22	1.00
v/c Ratio	0.50	0.74				0.99	0.74		0.77	0.65	0.23	0.02

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020

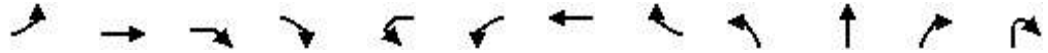


Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	21	127	232	143	6	258	98	127
Future Volume (vph)	21	127	232	143	6	258	98	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.320				0.950		
Satd. Flow (perm)	0	596	1863	1583	0	3433	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				128				199
Link Speed (mph)			35			35		
Link Distance (ft)			1258			355		
Travel Time (s)			24.5			6.9		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	138	252	155	7	280	107	138
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	161	252	155	0	287	107	138
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	14.0	14.0	39.0	15.2	36.5	36.5	36.5	
Total Split (%)	10.0%	10.0%	27.9%	10.9%	26.1%	26.1%	26.1%	
Maximum Green (s)	8.5	8.5	33.0	9.7	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		42.0	33.0	43.2		31.0	31.0	140.0
Actuated g/C Ratio		0.30	0.24	0.31		0.22	0.22	1.00
v/c Ratio		0.64	0.57	0.27		0.38	0.31	0.09

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020

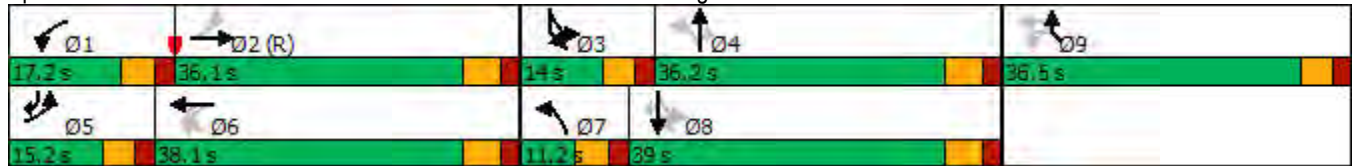


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Control Delay	41.3	58.5				94.5	56.4		63.3	58.6	47.4	0.0
Queue Delay	0.0	0.0				0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	41.3	58.5				94.5	56.4		63.3	58.6	47.4	0.0
LOS	D	E				F	E		E	E	D	A
Approach Delay		55.6					67.6			55.0		
Approach LOS		E					E			E		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	135
Control Type:	Pretimed
Maximum v/c Ratio:	0.99
Intersection Signal Delay:	52.4
Intersection LOS:	D
Intersection Capacity Utilization	80.1%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		50.2	53.3	5.7		48.0	48.4	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		50.2	53.3	5.7		48.0	48.4	0.1
LOS		D	D	A		D	D	A
Approach Delay			39.4			35.7		
Approach LOS			D			D		
Intersection Summary								

Lanes, Volumes, Timings

18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	200	92	139	305	239	180
Future Volume (vph)	200	92	139	305	239	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110	110	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Frt		0.850			0.936	
Flt Protected	0.950			0.985		
Satd. Flow (prot)	1770	1583	0	3486	3313	0
Flt Permitted	0.950			0.683		
Satd. Flow (perm)	1770	1583	0	2417	3313	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		100			196	
Link Speed (mph)	25			35	35	
Link Distance (ft)	368			1084	520	
Travel Time (s)	10.0			21.1	10.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	100	151	332	260	196
Shared Lane Traffic (%)						
Lane Group Flow (vph)	217	100	0	483	456	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			

Lanes, Volumes, Timings
 18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020

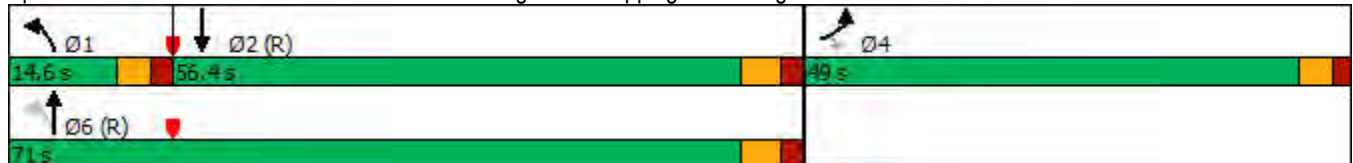


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	1	6	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0	7.0	10.0	10.0	
Minimum Split (s)	26.8	26.8	12.6	27.6	35.6	
Total Split (s)	49.0	49.0	14.6	71.0	56.4	
Total Split (%)	40.8%	40.8%	12.2%	59.2%	47.0%	
Maximum Green (s)	44.2	44.2	9.6	65.4	50.8	
Yellow Time (s)	3.0	3.0	3.0	3.6	3.6	
All-Red Time (s)	1.8	1.8	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.8	4.8		5.6	5.6	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effect Green (s)	20.3	20.3		89.3	89.3	
Actuated g/C Ratio	0.17	0.17		0.74	0.74	
v/c Ratio	0.73	0.29		0.27	0.18	
Control Delay	60.6	9.6		16.8	3.0	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	60.6	9.6		16.8	3.0	
LOS	E	A		B	A	
Approach Delay	44.5			16.8	3.0	
Approach LOS	D			B	A	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 18.8
 Intersection LOS: B
 Intersection Capacity Utilization 49.3%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 18: Northwest Boulevard & Kingsdale Shopping Center Signal



Timing Report, Sorted By Phase

7: Tremont Road & Zollinger Road

09/21/2020

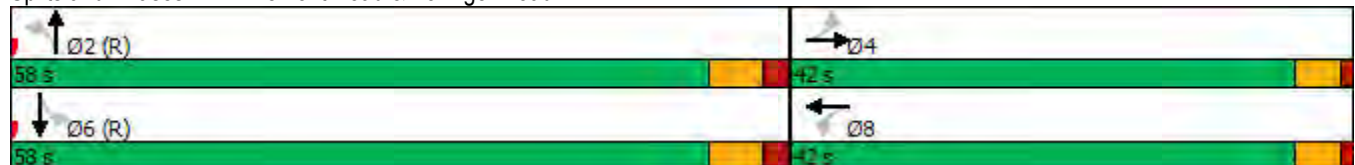


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	58	42	58	42
Maximum Split (%)	58.0%	42.0%	58.0%	42.0%
Minimum Split (s)	42	29.5	42	29.5
Yellow Time (s)	4	3.5	4	3.5
All-Red Time (s)	2	1	2	1
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	12	8	12	8
Flash Dont Walk (s)	24	17	24	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	58	0	58
End Time (s)	58	0	58	0
Yield/Force Off (s)	52	95.5	52	95.5
Yield/Force Off 170(s)	28	78.5	28	78.5
Local Start Time (s)	0	58	0	58
Local Yield (s)	52	95.5	52	95.5
Local Yield 170(s)	28	78.5	28	78.5

Intersection Summary

Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 7: Tremont Road & Zollinger Road



HCM 6th Signalized Intersection Summary
 7: Tremont Road & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (veh/h)	103	194	16	21	88	38	11	209	30	37	182	66
Future Volume (veh/h)	103	194	16	21	88	38	11	209	30	37	182	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	112	211	17	23	96	41	12	227	33	40	198	72
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	224	651	52	234	243	104	848	1117	162	799	916	333
Arrive On Green	0.20	0.20	0.20	0.06	0.06	0.06	0.70	0.70	0.70	1.00	1.00	1.00
Sat Flow, veh/h	1252	3333	266	1153	1244	531	1109	1596	232	1119	1309	476
Grp Volume(v), veh/h	112	112	116	23	0	137	12	0	260	40	0	270
Grp Sat Flow(s),veh/h/ln	1252	1777	1822	1153	0	1775	1109	0	1829	1119	0	1785
Q Serve(g_s), s	8.6	5.4	5.5	1.9	0.0	7.4	0.3	0.0	5.0	0.3	0.0	0.0
Cycle Q Clear(g_c), s	16.0	5.4	5.5	7.4	0.0	7.4	0.3	0.0	5.0	5.2	0.0	0.0
Prop In Lane	1.00		0.15	1.00		0.30	1.00		0.13	1.00		0.27
Lane Grp Cap(c), veh/h	224	347	356	234	0	347	848	0	1279	799	0	1249
V/C Ratio(X)	0.50	0.32	0.33	0.10	0.00	0.39	0.01	0.00	0.20	0.05	0.00	0.22
Avail Cap(c_a), veh/h	449	666	683	441	0	666	848	0	1279	799	0	1249
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	1.00	1.00	0.83	0.00	0.83	1.00	0.00	1.00	0.99	0.00	0.99
Uniform Delay (d), s/veh	42.4	34.5	34.6	43.7	0.0	41.1	4.6	0.0	5.3	0.2	0.0	0.0
Incr Delay (d2), s/veh	1.7	0.5	0.5	0.2	0.0	0.6	0.0	0.0	0.4	0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	2.3	2.4	0.6	0.0	3.4	0.1	0.0	1.8	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.1	35.1	35.1	43.9	0.0	41.7	4.6	0.0	5.6	0.3	0.0	0.4
LnGrp LOS	D	D	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		340			160			272			310	
Approach Delay, s/veh		38.1			42.0			5.6			0.4	
Approach LOS		D			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		76.0		24.0		76.0		24.0				
Change Period (Y+Rc), s		6.0		4.5		6.0		4.5				
Max Green Setting (Gmax), s		52.0		37.5		52.0		37.5				
Max Q Clear Time (g_c+I1), s		7.0		18.0		7.2		9.4				
Green Ext Time (p_c), s		1.9		1.5		2.1		0.8				

Intersection Summary		
HCM 6th Ctrl Delay		19.7
HCM 6th LOS		B

Timing Report, Sorted By Phase
 8: Northwest Boulevard & Zollinger Road

09/21/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	27	24	24	25
Maximum Split (%)	27.0%	24.0%	24.0%	25.0%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	51	27	75
End Time (s)	27	75	51	0
Yield/Force Off (s)	22	70	46	95
Yield/Force Off 170(s)	11	59	35	84
Local Start Time (s)	0	51	27	75
Local Yield (s)	22	70	46	95
Local Yield 170(s)	11	59	35	84

Intersection Summary

Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
 8: Northwest Boulevard & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	33	110	78	25	81	19	88	186	36	21	163	34
Future Volume (veh/h)	33	110	78	25	81	19	88	186	36	21	163	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	36	120	85	27	88	21	96	202	39	23	177	37
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	50	169	123	36	118	132	423	939	188	65	512	111
Arrive On Green	0.03	0.03	0.03	0.08	0.08	0.08	0.43	0.43	0.43	0.06	0.06	0.06
Sat Flow, veh/h	514	1724	1252	434	1415	1585	986	2189	437	340	2693	585
Grp Volume(v), veh/h	129	0	112	115	0	21	177	0	160	125	0	112
Grp Sat Flow(s),veh/h/ln	1845	0	1645	1849	0	1585	1821	0	1792	1853	0	1765
Q Serve(g_s), s	6.9	0.0	6.7	6.1	0.0	1.2	6.2	0.0	5.6	6.5	0.0	6.1
Cycle Q Clear(g_c), s	6.9	0.0	6.7	6.1	0.0	1.2	6.2	0.0	5.6	6.5	0.0	6.1
Prop In Lane	0.28		0.76	0.23		1.00	0.54		0.24	0.18		0.33
Lane Grp Cap(c), veh/h	181	0	161	154	0	132	781	0	768	352	0	335
V/C Ratio(X)	0.71	0.00	0.69	0.75	0.00	0.16	0.23	0.00	0.21	0.36	0.00	0.33
Avail Cap(c_a), veh/h	350	0	313	370	0	317	781	0	768	352	0	335
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.94	0.00	0.94	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.0	0.0	46.9	44.8	0.0	42.6	18.1	0.0	17.9	41.0	0.0	40.8
Incr Delay (d2), s/veh	4.9	0.0	4.9	7.1	0.0	0.6	0.7	0.0	0.6	2.8	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	3.1	3.0	0.0	0.5	2.7	0.0	2.4	3.3	0.0	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.9	0.0	51.8	51.9	0.0	43.2	18.8	0.0	18.5	43.8	0.0	43.5
LnGrp LOS	D	A	D	D	A	D	B	A	B	D	A	D
Approach Vol, veh/h		241			136			337				237
Approach Delay, s/veh		51.8			50.6			18.6				43.6
Approach LOS		D			D			B				D
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		47.9		14.8		24.0		13.3				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		22.0		19.0		19.0		20.0				
Max Q Clear Time (g_c+I1), s		8.2		8.9		8.5		8.1				
Green Ext Time (p_c), s		1.5		0.9		0.9		0.4				
Intersection Summary												
HCM 6th Ctrl Delay				37.8								
HCM 6th LOS				D								

HCM 6th TWSC
 11: Tremont Road & Ridgecliff Road

09/21/2020

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	8	7	377	378	15
Future Vol, veh/h	27	8	7	377	378	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	190	-	-	-
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	29	9	8	410	411	16

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	845	419	427	0	-	0
Stage 1	419	-	-	-	-	-
Stage 2	426	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	333	634	1132	-	-	-
Stage 1	664	-	-	-	-	-
Stage 2	659	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	331	634	1132	-	-	-
Mov Cap-2 Maneuver	331	-	-	-	-	-
Stage 1	659	-	-	-	-	-
Stage 2	659	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.8	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1132	-	372	-	-
HCM Lane V/C Ratio	0.007	-	0.102	-	-
HCM Control Delay (s)	8.2	-	15.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Timing Report, Sorted By Phase
 13: Tremont Road & Milden Road

09/21/2020

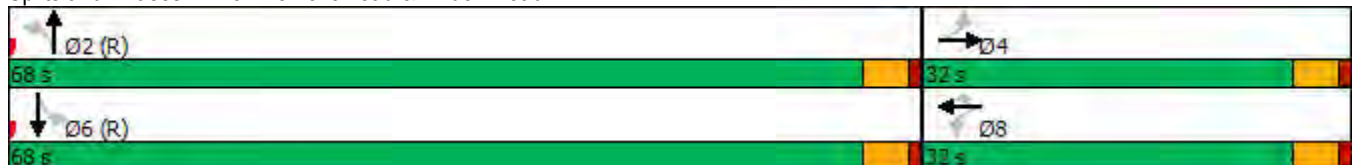


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	68	32	68	32
Maximum Split (%)	68.0%	32.0%	68.0%	32.0%
Minimum Split (s)	24.5	27.5	24.5	27.5
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	10	10	10	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	13	16	13	16
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	68	0	68
End Time (s)	68	0	68	0
Yield/Force Off (s)	63.5	95.5	63.5	95.5
Yield/Force Off 170(s)	50.5	79.5	50.5	79.5
Local Start Time (s)	0	68	0	68
Local Yield (s)	63.5	95.5	63.5	95.5
Local Yield 170(s)	50.5	79.5	50.5	79.5

Intersection Summary

Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	55
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 13: Tremont Road & Milden Road



HCM 6th Signalized Intersection Summary
 13: Tremont Road & Milden Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	15	6	7	22	8	29	8	331	36	63	273	7
Future Volume (veh/h)	15	6	7	22	8	29	8	331	36	63	273	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	7	8	24	9	32	9	360	39	68	297	8
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	50	38	158	50	147	911	1355	147	877	1481	40
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	1.00	1.00	1.00	0.82	0.82	0.82
Sat Flow, veh/h	628	533	404	1025	535	1585	1074	1658	180	986	1813	49
Grp Volume(v), veh/h	31	0	0	33	0	32	9	0	399	68	0	305
Grp Sat Flow(s),veh/h/ln	1566	0	0	1559	0	1585	1074	0	1838	986	0	1862
Q Serve(g_s), s	0.0	0.0	0.0	0.1	0.0	1.9	0.0	0.0	0.0	1.4	0.0	3.6
Cycle Q Clear(g_c), s	1.6	0.0	0.0	1.7	0.0	1.9	3.6	0.0	0.0	1.4	0.0	3.6
Prop In Lane	0.52		0.26	0.73		1.00	1.00		0.10	1.00		0.03
Lane Grp Cap(c), veh/h	200	0	0	207	0	147	911	0	1502	877	0	1521
V/C Ratio(X)	0.15	0.00	0.00	0.16	0.00	0.22	0.01	0.00	0.27	0.08	0.00	0.20
Avail Cap(c_a), veh/h	475	0	0	481	0	436	911	0	1502	877	0	1521
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	1.00	0.95	0.00	0.95	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.9	0.0	0.0	41.9	0.0	42.0	0.1	0.0	0.0	1.8	0.0	2.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.4	0.0	0.7	0.0	0.0	0.4	0.2	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.8	0.0	0.8	0.0	0.0	0.2	0.2	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.2	0.0	0.0	42.2	0.0	42.7	0.1	0.0	0.4	2.0	0.0	2.3
LnGrp LOS	D	A	A	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		31			65			408			373	
Approach Delay, s/veh		42.2			42.5			0.4			2.2	
Approach LOS		D			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		86.2		13.8		86.2		13.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		63.5		27.5		63.5		27.5				
Max Q Clear Time (g_c+I1), s		5.6		3.6		5.6		3.9				
Green Ext Time (p_c), s		3.0		0.1		2.5		0.2				
Intersection Summary												
HCM 6th Ctrl Delay				5.8								
HCM 6th LOS				A								

HCM 6th TWSC
16: Northwest Boulevard & Trentwood Road

09/21/2020

Intersection						
Int Delay, s/veh	1.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	TT		TT			TT
Traffic Vol, veh/h	38	29	223	11	16	236
Future Vol, veh/h	38	29	223	11	16	236
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	41	32	242	12	17	257

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	411	127	0	0	254
Stage 1	248	-	-	-	-
Stage 2	163	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	569	900	-	-	1308
Stage 1	770	-	-	-	-
Stage 2	849	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	560	900	-	-	1308
Mov Cap-2 Maneuver	560	-	-	-	-
Stage 1	758	-	-	-	-
Stage 2	849	-	-	-	-

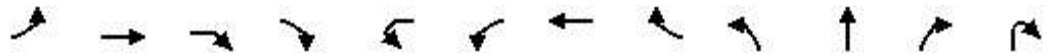
Approach	WB	NB	SB
HCM Control Delay, s	11	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	669	1308
HCM Lane V/C Ratio	-	-	0.109	0.013
HCM Control Delay (s)	-	-	11	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	160	729	135	61	27	87	253	10	102	167	159	27
Future Volume (vph)	160	729	135	61	27	87	253	10	102	167	159	27
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0			175		0	140		200	
Storage Lanes	1		0			1		0	1		2	
Taper Length (ft)	25					25			25			
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt		0.968					0.994				0.850	0.850
Flt Protected	0.950					0.950			0.950			
Satd. Flow (prot)	1770	3426	0	0	0	1770	3518	0	1770	1863	1583	1583
Flt Permitted	0.420					0.134			0.510			
Satd. Flow (perm)	782	3426	0	0	0	250	3518	0	950	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												284
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			449		
Travel Time (s)		22.6					18.2			12.2		
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
Adj. Flow (vph)	174	792	147	66	29	95	275	11	111	182	173	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	174	1005	0	0	0	124	286	0	111	182	173	29
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA			Perm	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2				1	6		7	4		
Permitted Phases	2				6	6			4		4	Free
Minimum Split (s)	10.5	36.0			30.0	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	18.2	43.0			35.8	11.0	35.8		10.5	33.3	33.3	
Total Split (%)	13.0%	30.7%			25.6%	7.9%	25.6%		7.5%	23.8%	23.8%	
Maximum Green (s)	12.7	37.0			29.8	5.5	29.8		5.0	27.3	27.3	
Yellow Time (s)	3.5	4.0			4.0	3.5	4.0		3.5	4.0	4.0	
All-Red Time (s)	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	
Total Lost Time (s)	5.5	6.0				5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag			Lag	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0			10.0		10.0			10.0	10.0	
Flash Dont Walk (s)		20.0			14.0		14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0			0	0	
Act Effct Green (s)	48.5	37.0				35.8	29.8		32.8	27.3	27.3	140.0
Actuated g/C Ratio	0.35	0.26				0.26	0.21		0.23	0.20	0.20	1.00
v/c Ratio	0.48	1.11				1.01	0.38		0.44	0.50	0.56	0.02

HY AM No Build

Synchro 10 Report

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	76	151	218	104	1	149	66	78
Future Volume (vph)	76	151	218	104	1	149	66	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.404				0.950		
Satd. Flow (perm)	0	753	1863	1583	0	3433	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				109				284
Link Speed (mph)			35			35		
Link Distance (ft)			1258			343		
Travel Time (s)			24.5			6.7		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	164	237	113	1	162	72	85
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	247	237	113	0	163	72	85
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	16.2	16.2	39.0	18.2	36.5	36.5	36.5	
Total Split (%)	11.6%	11.6%	27.9%	13.0%	26.1%	26.1%	26.1%	
Maximum Green (s)	10.7	10.7	33.0	12.7	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		44.0	33.0	46.2		31.0	31.0	140.0
Actuated g/C Ratio		0.31	0.24	0.33		0.22	0.22	1.00
v/c Ratio		0.79	0.54	0.19		0.21	0.21	0.05

HY AM No Build

Synchro 10 Report

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020

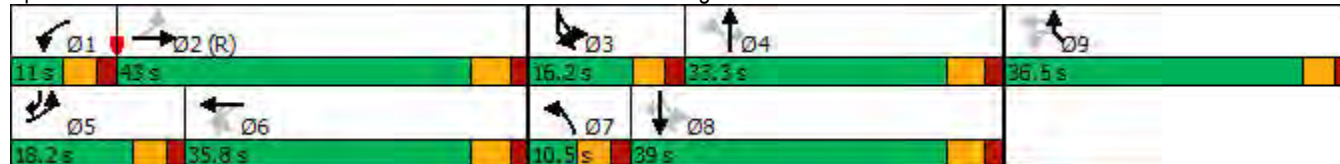


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Control Delay	38.3	112.0				123.0	49.0		45.0	55.8	58.9	0.0
Queue Delay	0.0	0.0				0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	38.3	112.0				123.0	49.0		45.0	55.8	58.9	0.0
LOS	D	F				F	D		D	E	E	A
Approach Delay		101.1					71.4			51.2		
Approach LOS		F					E			D		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	145
Control Type:	Pretimed
Maximum v/c Ratio:	1.11
Intersection Signal Delay:	70.6
Intersection LOS:	E
Intersection Capacity Utilization	84.7%
ICU Level of Service	E
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		58.8	52.2	3.9		45.5	46.4	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		58.8	52.2	3.9		45.5	46.4	0.1
LOS		E	D	A		D	D	A
Approach Delay		45.8				33.6		
Approach LOS		D				C		
Intersection Summary								

Lanes, Volumes, Timings

18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	40	3	31	192	199	60
Future Volume (vph)	40	3	31	192	199	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110	110	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Frt		0.850			0.965	
Flt Protected	0.950			0.993		
Satd. Flow (prot)	1770	1583	0	3514	3415	0
Flt Permitted	0.950			0.884		
Satd. Flow (perm)	1770	1583	0	3129	3415	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		3			54	
Link Speed (mph)	25			35	35	
Link Distance (ft)	368			1084	519	
Travel Time (s)	10.0			21.1	10.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	3	34	209	216	65
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	3	0	243	281	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			

HY AM No Build

Synchro 10 Report

Lanes, Volumes, Timings
 18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020

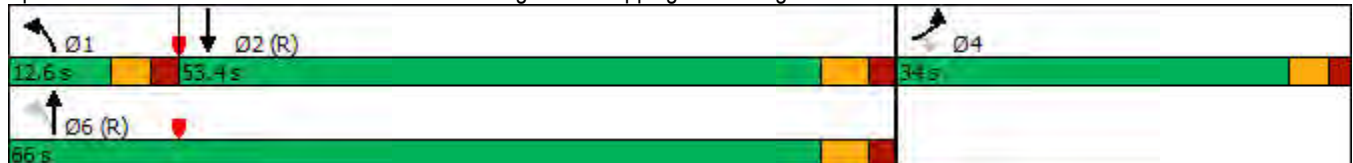


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	1	6	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0	7.0	10.0	10.0	
Minimum Split (s)	26.8	26.8	12.6	27.6	35.6	
Total Split (s)	34.0	34.0	12.6	66.0	53.4	
Total Split (%)	34.0%	34.0%	12.6%	66.0%	53.4%	
Maximum Green (s)	29.2	29.2	7.6	60.4	47.8	
Yellow Time (s)	3.0	3.0	3.0	3.6	3.6	
All-Red Time (s)	1.8	1.8	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.8	4.8		5.6	5.6	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effect Green (s)	8.7	8.7		88.2	88.2	
Actuated g/C Ratio	0.09	0.09		0.88	0.88	
v/c Ratio	0.28	0.02		0.09	0.09	
Control Delay	47.1	27.3		6.0	1.4	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	47.1	27.3		6.0	1.4	
LOS	D	C		A	A	
Approach Delay	45.9			6.0	1.4	
Approach LOS	D			A	A	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.28
 Intersection Signal Delay: 6.9
 Intersection LOS: A
 Intersection Capacity Utilization 36.7%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 18: Northwest Boulevard & Kingsdale Shopping Center Signal



Timing Report, Sorted By Phase

7: Tremont Road & Zollinger Road

09/21/2020

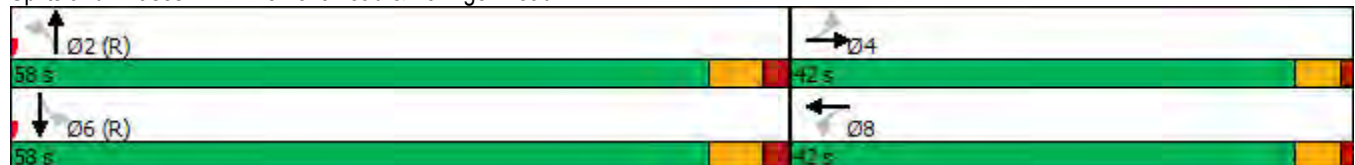


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	58	42	58	42
Maximum Split (%)	58.0%	42.0%	58.0%	42.0%
Minimum Split (s)	42	29.5	42	29.5
Yellow Time (s)	4	3.5	4	3.5
All-Red Time (s)	2	1	2	1
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	12	8	12	8
Flash Dont Walk (s)	24	17	24	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	58	0	58
End Time (s)	58	0	58	0
Yield/Force Off (s)	52	95.5	52	95.5
Yield/Force Off 170(s)	28	78.5	28	78.5
Local Start Time (s)	0	58	0	58
Local Yield (s)	52	95.5	52	95.5
Local Yield 170(s)	28	78.5	28	78.5

Intersection Summary

Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 7: Tremont Road & Zollinger Road



HCM 6th Signalized Intersection Summary
 7: Tremont Road & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↶↷		↶	↷		↶	↷		↶	↷	
Traffic Volume (veh/h)	137	194	16	21	88	38	11	246	30	37	211	94
Future Volume (veh/h)	137	194	16	21	88	38	11	246	30	37	211	94
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	149	211	17	23	96	41	12	267	33	40	229	102
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	260	746	60	269	278	119	776	1096	135	727	823	367
Arrive On Green	0.22	0.22	0.22	0.07	0.07	0.07	0.67	0.67	0.67	1.00	1.00	1.00
Sat Flow, veh/h	1252	3333	266	1153	1244	531	1049	1632	202	1079	1226	546
Grp Volume(v), veh/h	149	112	116	23	0	137	12	0	300	40	0	331
Grp Sat Flow(s),veh/h/ln	1252	1777	1822	1153	0	1775	1049	0	1834	1079	0	1772
Q Serve(g_s), s	11.5	5.2	5.3	1.9	0.0	7.3	0.4	0.0	6.4	0.4	0.0	0.0
Cycle Q Clear(g_c), s	18.8	5.2	5.3	7.2	0.0	7.3	0.4	0.0	6.4	6.8	0.0	0.0
Prop In Lane	1.00		0.15	1.00		0.30	1.00		0.11	1.00		0.31
Lane Grp Cap(c), veh/h	260	397	408	269	0	397	776	0	1231	727	0	1190
V/C Ratio(X)	0.57	0.28	0.29	0.09	0.00	0.35	0.02	0.00	0.24	0.06	0.00	0.28
Avail Cap(c_a), veh/h	450	666	683	443	0	666	776	0	1231	727	0	1190
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	1.00	1.00	0.83	0.00	0.83	1.00	0.00	1.00	0.98	0.00	0.98
Uniform Delay (d), s/veh	41.0	32.2	32.2	41.8	0.0	39.3	5.5	0.0	6.5	0.3	0.0	0.0
Incr Delay (d2), s/veh	2.0	0.4	0.4	0.1	0.0	0.4	0.0	0.0	0.5	0.1	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	2.2	2.3	0.6	0.0	3.4	0.1	0.0	2.5	0.0	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	32.5	32.6	41.9	0.0	39.8	5.5	0.0	6.9	0.5	0.0	0.6
LnGrp LOS	D	C	C	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		377			160			312			371	
Approach Delay, s/veh		36.7			40.1			6.9			0.6	
Approach LOS		D			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		73.1		26.9		73.1		26.9				
Change Period (Y+Rc), s		6.0		4.5		6.0		4.5				
Max Green Setting (Gmax), s		52.0		37.5		52.0		37.5				
Max Q Clear Time (g_c+I1), s		8.4		20.8		8.8		9.3				
Green Ext Time (p_c), s		2.2		1.6		2.6		0.8				
Intersection Summary												
HCM 6th Ctrl Delay				18.5								
HCM 6th LOS				B								

Timing Report, Sorted By Phase
 8: Northwest Boulevard & Zollinger Road

09/21/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	27	24	24	25
Maximum Split (%)	27.0%	24.0%	24.0%	25.0%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	51	27	75
End Time (s)	27	75	51	0
Yield/Force Off (s)	22	70	46	95
Yield/Force Off 170(s)	11	59	35	84
Local Start Time (s)	0	51	27	75
Local Yield (s)	22	70	46	95
Local Yield 170(s)	11	59	35	84

Intersection Summary	
Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
 8: Northwest Boulevard & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	33	110	78	25	81	38	88	225	36	36	194	34
Future Volume (veh/h)	33	110	78	25	81	38	88	225	36	36	194	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	36	120	85	27	88	41	96	245	39	39	211	37
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	50	169	123	37	119	134	375	1009	167	90	507	93
Arrive On Green	0.03	0.03	0.03	0.08	0.08	0.08	0.43	0.43	0.43	0.06	0.06	0.06
Sat Flow, veh/h	514	1724	1252	434	1415	1585	877	2360	390	475	2667	487
Grp Volume(v), veh/h	129	0	112	115	0	41	200	0	180	152	0	135
Grp Sat Flow(s),veh/h/ln	1845	0	1645	1849	0	1585	1826	0	1800	1847	0	1783
Q Serve(g_s), s	6.9	0.0	6.7	6.1	0.0	2.4	7.0	0.0	6.4	7.9	0.0	7.3
Cycle Q Clear(g_c), s	6.9	0.0	6.7	6.1	0.0	2.4	7.0	0.0	6.4	7.9	0.0	7.3
Prop In Lane	0.28		0.76	0.23		1.00	0.48		0.22	0.26		0.27
Lane Grp Cap(c), veh/h	181	0	161	156	0	134	781	0	769	351	0	339
V/C Ratio(X)	0.71	0.00	0.69	0.74	0.00	0.31	0.26	0.00	0.23	0.43	0.00	0.40
Avail Cap(c_a), veh/h	350	0	313	370	0	317	781	0	769	351	0	339
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	0.96	0.00	0.96	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.0	0.0	46.9	44.7	0.0	43.0	18.4	0.0	18.2	41.7	0.0	41.4
Incr Delay (d2), s/veh	5.0	0.0	5.0	6.6	0.0	1.3	0.8	0.0	0.7	3.8	0.0	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	3.1	3.0	0.0	1.0	3.0	0.0	2.7	4.1	0.0	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.0	0.0	51.9	51.3	0.0	44.3	19.2	0.0	18.9	45.5	0.0	44.9
LnGrp LOS	D	A	D	D	A	D	B	A	B	D	A	D
Approach Vol, veh/h		241			156			380				287
Approach Delay, s/veh		51.9			49.5			19.1				45.2
Approach LOS		D			D			B				D
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		47.7		14.8		24.0		13.4				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		22.0		19.0		19.0		20.0				
Max Q Clear Time (g_c+I1), s		9.0		8.9		9.9		8.1				
Green Ext Time (p_c), s		1.7		0.9		1.0		0.5				
Intersection Summary												
HCM 6th Ctrl Delay				38.0								
HCM 6th LOS				D								

HCM 6th TWSC
 11: Tremont Road & Ridgecliff Road

09/21/2020

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	27	2	8	37	2	39	7	377	48	48	378	15
Future Vol, veh/h	27	2	8	37	2	39	7	377	48	48	378	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	190	-	-	290	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	2	9	40	2	42	8	410	52	52	411	16

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	997	1001	419	981	983	436	427	0	0	462	0	0
Stage 1	523	523	-	452	452	-	-	-	-	-	-	-
Stage 2	474	478	-	529	531	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	223	243	634	229	249	620	1132	-	-	1099	-	-
Stage 1	537	530	-	587	570	-	-	-	-	-	-	-
Stage 2	571	556	-	533	526	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	198	230	634	215	236	620	1132	-	-	1099	-	-
Mov Cap-2 Maneuver	198	230	-	215	236	-	-	-	-	-	-	-
Stage 1	533	505	-	583	566	-	-	-	-	-	-	-
Stage 2	526	552	-	499	501	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	23.5		20.3		0.1		0.9	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1132	-	-	235	320	1099	-
HCM Lane V/C Ratio	0.007	-	-	0.171	0.265	0.047	-
HCM Control Delay (s)	8.2	-	-	23.5	20.3	8.4	-
HCM Lane LOS	A	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	1	0.1	-

Timing Report, Sorted By Phase
 13: Tremont Road & Milden Road

09/21/2020

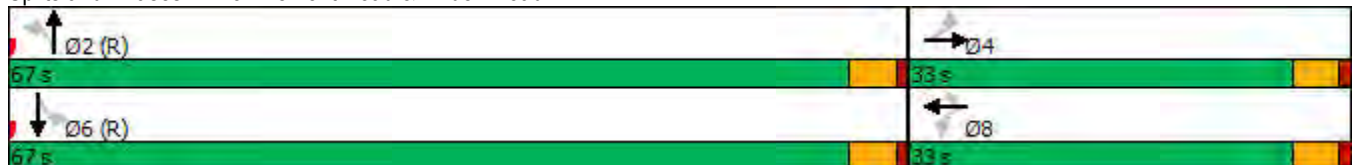


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	67	33	67	33
Maximum Split (%)	67.0%	33.0%	67.0%	33.0%
Minimum Split (s)	24.5	27.5	24.5	27.5
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	10	10	10	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	13	16	13	16
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	67	0	67
End Time (s)	67	0	67	0
Yield/Force Off (s)	62.5	95.5	62.5	95.5
Yield/Force Off 170(s)	49.5	79.5	49.5	79.5
Local Start Time (s)	0	67	0	67
Local Yield (s)	62.5	95.5	62.5	95.5
Local Yield 170(s)	49.5	79.5	49.5	79.5

Intersection Summary




















Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	55
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 13: Tremont Road & Milden Road



HCM 6th Signalized Intersection Summary
 13: Tremont Road & Milden Road

09/21/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	6	7	42	10	29	8	377	61	63	310	7
Future Volume (veh/h)	17	6	7	42	10	29	8	377	61	63	310	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	18	7	8	46	11	32	9	410	66	68	337	8
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	111	44	32	181	37	153	870	1278	206	819	1480	35
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	1.00	1.00	1.00	0.81	0.81	0.81
Sat Flow, veh/h	570	451	326	1198	379	1585	1036	1572	253	918	1819	43
Grp Volume(v), veh/h	33	0	0	57	0	32	9	0	476	68	0	345
Grp Sat Flow(s),veh/h/ln	1347	0	0	1577	0	1585	1036	0	1825	918	0	1863
Q Serve(g_s), s	0.1	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	1.5	0.0	4.2
Cycle Q Clear(g_c), s	3.0	0.0	0.0	2.9	0.0	1.9	4.3	0.0	0.0	1.5	0.0	4.2
Prop In Lane	0.55		0.24	0.81		1.00	1.00		0.14	1.00		0.02
Lane Grp Cap(c), veh/h	186	0	0	217	0	153	870	0	1484	819	0	1515
V/C Ratio(X)	0.18	0.00	0.00	0.26	0.00	0.21	0.01	0.00	0.32	0.08	0.00	0.23
Avail Cap(c_a), veh/h	468	0	0	494	0	452	870	0	1484	819	0	1515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	1.00	0.92	0.00	0.92	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.6	0.0	0.0	42.1	0.0	41.6	0.1	0.0	0.0	1.9	0.0	2.1
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.6	0.0	0.7	0.0	0.0	0.5	0.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	1.4	0.0	0.8	0.0	0.0	0.2	0.2	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.1	0.0	0.0	42.8	0.0	42.3	0.1	0.0	0.5	2.1	0.0	2.5
LnGrp LOS	D	A	A	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		33			89			485			413	
Approach Delay, s/veh		42.1			42.6			0.5			2.4	
Approach LOS		D			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		85.8		14.2		85.8		14.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		62.5		28.5		62.5		28.5				
Max Q Clear Time (g_c+I1), s		6.3		5.0		6.2		4.9				
Green Ext Time (p_c), s		3.8		0.1		2.9		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				6.3								
HCM 6th LOS				A								

HCM 6th TWSC
16: Northwest Boulevard & Trentwood Road

09/21/2020

Intersection						
Int Delay, s/veh	1.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	45	29	256	17	16	277
Future Vol, veh/h	45	29	256	17	16	277
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	49	32	278	18	17	301

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	472	148	0	0	296
Stage 1	287	-	-	-	-
Stage 2	185	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	521	872	-	-	1262
Stage 1	736	-	-	-	-
Stage 2	828	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	513	872	-	-	1262
Mov Cap-2 Maneuver	513	-	-	-	-
Stage 1	724	-	-	-	-
Stage 2	828	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.8	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	612	1262
HCM Lane V/C Ratio	-	-	0.131	0.014
HCM Control Delay (s)	-	-	11.8	7.9
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.5	0

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	160	729	153	70	34	101	253	10	110	187	159	38
Future Volume (vph)	160	729	153	70	34	101	253	10	110	187	159	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0				175	0	140		200	
Storage Lanes	1		0				1	0	1		1	
Taper Length (ft)	25						25		25			
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt		0.965					0.994				0.850	0.850
Flt Protected	0.950					0.950			0.950			
Satd. Flow (prot)	1770	3415	0	0	0	1770	3518	0	1770	1863	1583	1583
Flt Permitted	0.420					0.134			0.445			
Satd. Flow (perm)	782	3415	0	0	0	250	3518	0	829	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												242
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			435		
Travel Time (s)		22.6					18.2			11.9		
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
Adj. Flow (vph)	174	792	166	76	37	110	275	11	120	203	173	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	174	1034	0	0	0	147	286	0	120	203	173	41
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA			Perm	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2				1	6		7	4		
Permitted Phases	2				6	6			4		4	Free
Minimum Split (s)	10.5	36.0			30.0	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	18.2	43.0			35.8	11.0	35.8		10.5	33.6	33.6	
Total Split (%)	13.0%	30.7%			25.6%	7.9%	25.6%		7.5%	24.0%	24.0%	
Maximum Green (s)	12.7	37.0			29.8	5.5	29.8		5.0	27.6	27.6	
Yellow Time (s)	3.5	4.0			4.0	3.5	4.0		3.5	4.0	4.0	
All-Red Time (s)	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	
Total Lost Time (s)	5.5	6.0				5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag			Lag	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0			10.0		10.0			10.0	10.0	
Flash Dont Walk (s)		20.0			14.0		14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0			0	0	
Act Effct Green (s)	48.5	37.0				35.8	29.8		33.1	27.6	27.6	140.0
Actuated g/C Ratio	0.35	0.26				0.26	0.21		0.24	0.20	0.20	1.00
v/c Ratio	0.48	1.15				1.20	0.38		0.52	0.55	0.55	0.03

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020

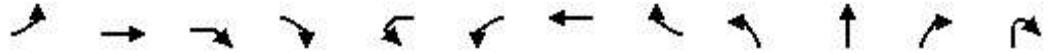


Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	76	167	243	104	1	163	79	84
Future Volume (vph)	76	167	243	104	1	163	79	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.369				0.950		
Satd. Flow (perm)	0	687	1863	1583	0	3433	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				109				242
Link Speed (mph)			35			35		
Link Distance (ft)			1258			350		
Travel Time (s)			24.5			6.8		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	182	264	113	1	177	86	91
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	265	264	113	0	178	86	91
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	15.9	15.9	39.0	18.2	36.5	36.5	36.5	
Total Split (%)	11.4%	11.4%	27.9%	13.0%	26.1%	26.1%	26.1%	
Maximum Green (s)	10.4	10.4	33.0	12.7	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		43.9	33.0	46.2		31.0	31.0	140.0
Actuated g/C Ratio		0.31	0.24	0.33		0.22	0.22	1.00
v/c Ratio		0.90	0.60	0.19		0.23	0.25	0.06

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020

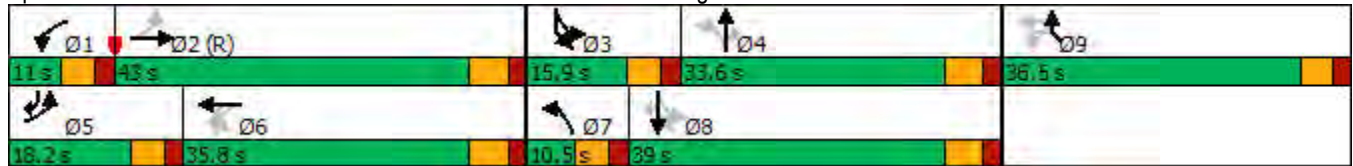


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Control Delay	38.3	124.6				178.2	49.0		48.7	57.2	58.4	0.0
Queue Delay	0.0	0.0				0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	38.3	124.6				178.2	49.0		48.7	57.2	58.4	0.0
LOS	D	F				F	D		D	E	E	A
Approach Delay		112.2					92.9			51.3		
Approach LOS		F					F			D		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	145
Control Type:	Pretimed
Maximum v/c Ratio:	1.20
Intersection Signal Delay:	78.7
Intersection LOS:	E
Intersection Capacity Utilization	87.6%
ICU Level of Service	E
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		74.1	54.3	3.9		45.8	47.1	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		74.1	54.3	3.9		45.8	47.1	0.1
LOS		E	D	A		D	D	A
Approach Delay			53.6			34.4		
Approach LOS			D			C		
Intersection Summary								

Lanes, Volumes, Timings

18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	79	49	89	192	199	108
Future Volume (vph)	79	49	89	192	199	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110	110	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Frt		0.850			0.947	
Flt Protected	0.950			0.984		
Satd. Flow (prot)	1770	1583	0	3483	3352	0
Flt Permitted	0.950			0.751		
Satd. Flow (perm)	1770	1583	0	2658	3352	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		53			117	
Link Speed (mph)	25			35	35	
Link Distance (ft)	368			1084	522	
Travel Time (s)	10.0			21.1	10.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	53	97	209	216	117
Shared Lane Traffic (%)						
Lane Group Flow (vph)	86	53	0	306	333	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			

Lanes, Volumes, Timings
 18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020

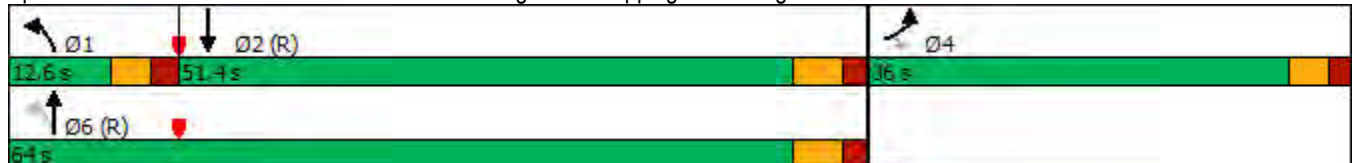


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	1	6	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0	7.0	10.0	10.0	
Minimum Split (s)	26.8	26.8	12.6	27.6	35.6	
Total Split (s)	36.0	36.0	12.6	64.0	51.4	
Total Split (%)	36.0%	36.0%	12.6%	64.0%	51.4%	
Maximum Green (s)	31.2	31.2	7.6	58.4	45.8	
Yellow Time (s)	3.0	3.0	3.0	3.6	3.6	
All-Red Time (s)	1.8	1.8	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.8	4.8		5.6	5.6	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effect Green (s)	10.6	10.6		82.7	82.7	
Actuated g/C Ratio	0.11	0.11		0.83	0.83	
v/c Ratio	0.46	0.25		0.14	0.12	
Control Delay	49.5	14.1		8.3	1.7	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	49.5	14.1		8.3	1.7	
LOS	D	B		A	A	
Approach Delay	36.0			8.3	1.7	
Approach LOS	D			A	A	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.46
 Intersection Signal Delay: 10.5
 Intersection LOS: B
 Intersection Capacity Utilization 37.3%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 18: Northwest Boulevard & Kingsdale Shopping Center Signal



Timing Report, Sorted By Phase
7: Tremont Road & Zollinger Road

09/21/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	70	50	70	50
Maximum Split (%)	58.3%	41.7%	58.3%	41.7%
Minimum Split (s)	42	29.5	42	29.5
Yellow Time (s)	4	3.5	4	3.5
All-Red Time (s)	2	1	2	1
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	12	8	12	8
Flash Dont Walk (s)	24	17	24	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	70	0	70
End Time (s)	70	0	70	0
Yield/Force Off (s)	64	115.5	64	115.5
Yield/Force Off 170(s)	40	98.5	40	98.5
Local Start Time (s)	0	70	0	70
Local Yield (s)	64	115.5	64	115.5
Local Yield 170(s)	40	98.5	40	98.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 7: Tremont Road & Zollinger Road



HCM 6th Signalized Intersection Summary
 7: Tremont Road & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (veh/h)	95	169	48	54	200	56	37	317	43	34	292	101
Future Volume (veh/h)	95	169	48	54	200	56	37	317	43	34	292	101
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	184	52	59	217	61	40	345	47	37	317	110
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	192	738	203	305	376	106	679	1038	141	603	855	297
Arrive On Green	0.27	0.27	0.27	0.09	0.09	0.09	0.64	0.64	0.64	1.00	1.00	1.00
Sat Flow, veh/h	1101	2754	757	1144	1404	395	961	1611	220	992	1327	460
Grp Volume(v), veh/h	103	117	119	59	0	278	40	0	392	37	0	427
Grp Sat Flow(s),veh/h/ln	1101	1777	1734	1144	0	1799	961	0	1831	992	0	1787
Q Serve(g_s), s	10.9	6.2	6.5	5.8	0.0	17.8	1.9	0.0	11.6	0.7	0.0	0.0
Cycle Q Clear(g_c), s	28.7	6.2	6.5	12.3	0.0	17.8	1.9	0.0	11.6	12.3	0.0	0.0
Prop In Lane	1.00		0.44	1.00		0.22	1.00		0.12	1.00		0.26
Lane Grp Cap(c), veh/h	192	476	465	305	0	482	679	0	1180	603	0	1152
V/C Ratio(X)	0.54	0.25	0.26	0.19	0.00	0.58	0.06	0.00	0.33	0.06	0.00	0.37
Avail Cap(c_a), veh/h	314	674	657	432	0	682	679	0	1180	603	0	1152
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	1.00	1.00	0.68	0.00	0.68	1.00	0.00	1.00	0.97	0.00	0.97
Uniform Delay (d), s/veh	51.3	34.4	34.5	48.7	0.0	48.1	7.9	0.0	9.7	0.9	0.0	0.0
Incr Delay (d2), s/veh	2.3	0.3	0.3	0.2	0.0	0.7	0.2	0.0	0.8	0.2	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	2.7	2.8	1.8	0.0	8.7	0.4	0.0	4.8	0.1	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.6	34.7	34.8	48.9	0.0	48.9	8.1	0.0	10.4	1.1	0.0	0.9
LnGrp LOS	D	C	C	D	A	D	A	A	B	A	A	A
Approach Vol, veh/h		339			337			432				464
Approach Delay, s/veh		40.5			48.9			10.2				0.9
Approach LOS		D			D			B				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		83.3		36.7		83.3		36.7				
Change Period (Y+Rc), s		6.0		4.5		6.0		4.5				
Max Green Setting (Gmax), s		64.0		45.5		64.0		45.5				
Max Q Clear Time (g_c+I1), s		13.6		30.7		14.3		19.8				
Green Ext Time (p_c), s		3.2		1.5		3.5		1.9				
Intersection Summary												
HCM 6th Ctrl Delay				22.3								
HCM 6th LOS				C								

Timing Report, Sorted By Phase

8: Northwest Boulevard & Zollinger Road

09/21/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	36	27	29	28
Maximum Split (%)	30.0%	22.5%	24.2%	23.3%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	65	36	92
End Time (s)	36	92	65	0
Yield/Force Off (s)	31	87	60	115
Yield/Force Off 170(s)	20	76	49	104
Local Start Time (s)	0	65	36	92
Local Yield (s)	31	87	60	115
Local Yield 170(s)	20	76	49	104

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
 8: Northwest Boulevard & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	58	170	98	17	135	71	89	273	55	59	258	66
Future Volume (veh/h)	58	170	98	17	135	71	89	273	55	59	258	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	63	185	107	18	147	77	97	297	60	64	280	72
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	79	235	141	22	182	174	292	936	197	107	483	130
Arrive On Green	0.04	0.04	0.04	0.11	0.11	0.11	0.39	0.39	0.39	0.07	0.07	0.07
Sat Flow, veh/h	607	1815	1092	203	1657	1585	741	2374	499	533	2416	649
Grp Volume(v), veh/h	191	0	164	165	0	77	240	0	214	221	0	195
Grp Sat Flow(s),veh/h/ln	1840	0	1674	1860	0	1585	1833	0	1780	1844	0	1754
Q Serve(g_s), s	12.3	0.0	11.6	10.4	0.0	5.5	11.0	0.0	9.9	14.0	0.0	12.9
Cycle Q Clear(g_c), s	12.3	0.0	11.6	10.4	0.0	5.5	11.0	0.0	9.9	14.0	0.0	12.9
Prop In Lane	0.33		0.65	0.11		1.00	0.40		0.28	0.29		0.37
Lane Grp Cap(c), veh/h	238	0	217	204	0	174	723	0	702	369	0	351
V/C Ratio(X)	0.80	0.00	0.76	0.81	0.00	0.44	0.33	0.00	0.30	0.60	0.00	0.56
Avail Cap(c_a), veh/h	337	0	307	357	0	304	723	0	702	369	0	351
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	0.96	0.00	0.96	1.00	0.00	1.00	1.00	0.00	1.00	0.99	0.00	0.99
Uniform Delay (d), s/veh	55.9	0.0	55.6	52.2	0.0	50.0	25.3	0.0	25.0	51.4	0.0	50.9
Incr Delay (d2), s/veh	8.6	0.0	6.3	7.4	0.0	1.8	1.2	0.0	1.1	7.0	0.0	6.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	0.0	5.6	5.2	0.0	2.2	5.0	0.0	4.4	7.7	0.0	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.5	0.0	61.9	59.6	0.0	51.7	26.6	0.0	26.2	58.4	0.0	57.0
LnGrp LOS	E	A	E	E	A	D	C	A	C	E	A	E
Approach Vol, veh/h		355			242			454				416
Approach Delay, s/veh		63.3			57.1			26.4				57.7
Approach LOS		E			E			C				E
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		52.3		20.5		29.0		18.2				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		31.0		22.0		24.0		23.0				
Max Q Clear Time (g_c+I1), s		13.0		14.3		16.0		12.4				
Green Ext Time (p_c), s		2.4		1.2		1.5		0.8				
Intersection Summary												
HCM 6th Ctrl Delay				49.3								
HCM 6th LOS				D								

HCM 6th TWSC
 11: Tremont Road & Ridgecliff Road

09/21/2020

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	22	13	16	441	416	35
Future Vol, veh/h	22	13	16	441	416	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	190	-	-	-
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	24	14	17	479	452	38

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	984	471	490	0	-	0
Stage 1	471	-	-	-	-	-
Stage 2	513	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	275	593	1073	-	-	-
Stage 1	628	-	-	-	-	-
Stage 2	601	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	271	593	1073	-	-	-
Mov Cap-2 Maneuver	271	-	-	-	-	-
Stage 1	618	-	-	-	-	-
Stage 2	601	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1073	-	339	-	-
HCM Lane V/C Ratio	0.016	-	0.112	-	-
HCM Control Delay (s)	8.4	-	17	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Timing Report, Sorted By Phase
 13: Tremont Road & Milden Road

09/21/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	81	39	81	39
Maximum Split (%)	67.5%	32.5%	67.5%	32.5%
Minimum Split (s)	24.5	27.5	24.5	27.5
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	10	10	10	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	13	16	13	16
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	81	0	81
End Time (s)	81	0	81	0
Yield/Force Off (s)	76.5	115.5	76.5	115.5
Yield/Force Off 170(s)	63.5	99.5	63.5	99.5
Local Start Time (s)	0	81	0	81
Local Yield (s)	76.5	115.5	76.5	115.5
Local Yield 170(s)	63.5	99.5	63.5	99.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	55
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 13: Tremont Road & Milden Road



HCM 6th Signalized Intersection Summary
 13: Tremont Road & Milden Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	30	16	6	64	24	88	14	325	90	95	369	15
Future Volume (veh/h)	30	16	6	64	24	88	14	325	90	95	369	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	17	7	70	26	96	15	353	98	103	401	16
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	82	37	10	155	48	174	798	1148	319	826	1456	58
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	1.00	1.00	1.00	0.82	0.82	0.82
Sat Flow, veh/h	319	341	92	934	434	1585	969	1409	391	940	1786	71
Grp Volume(v), veh/h	57	0	0	96	0	96	15	0	451	103	0	417
Grp Sat Flow(s),veh/h/ln	753	0	0	1368	0	1585	969	0	1800	940	0	1858
Q Serve(g_s), s	2.8	0.0	0.0	0.0	0.0	6.9	0.1	0.0	0.0	2.7	0.0	6.4
Cycle Q Clear(g_c), s	11.0	0.0	0.0	8.2	0.0	6.9	6.5	0.0	0.0	2.7	0.0	6.4
Prop In Lane	0.58		0.12	0.73		1.00	1.00		0.22	1.00		0.04
Lane Grp Cap(c), veh/h	130	0	0	202	0	174	798	0	1467	826	0	1514
V/C Ratio(X)	0.44	0.00	0.00	0.47	0.00	0.55	0.02	0.00	0.31	0.12	0.00	0.28
Avail Cap(c_a), veh/h	386	0	0	467	0	456	798	0	1467	826	0	1514
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	1.00	0.88	0.00	0.88	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.0	0.0	0.0	51.0	0.0	50.6	0.2	0.0	0.0	2.3	0.0	2.6
Incr Delay (d2), s/veh	2.3	0.0	0.0	1.7	0.0	2.7	0.0	0.0	0.5	0.3	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	0.0	2.9	0.0	2.9	0.0	0.0	0.2	0.5	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.3	0.0	0.0	52.8	0.0	53.3	0.3	0.0	0.5	2.6	0.0	3.1
LnGrp LOS	E	A	A	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		57			192			466			520	
Approach Delay, s/veh		55.3			53.0			0.5			3.0	
Approach LOS		E			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		102.3		17.7		102.3		17.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		76.5		34.5		76.5		34.5				
Max Q Clear Time (g_c+I1), s		8.5		13.0		8.4		10.2				
Green Ext Time (p_c), s		3.7		0.2		3.8		0.8				
Intersection Summary												
HCM 6th Ctrl Delay				12.2								
HCM 6th LOS				B								

HCM 6th TWSC
16: Northwest Boulevard & Trentwood Road

09/21/2020

Intersection						
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	41	27	442	37	21	356
Future Vol, veh/h	41	27	442	37	21	356
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	45	29	480	40	23	387

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	740	260	0	0	520
Stage 1	500	-	-	-	-
Stage 2	240	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	352	739	-	-	1042
Stage 1	575	-	-	-	-
Stage 2	777	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	342	739	-	-	1042
Mov Cap-2 Maneuver	342	-	-	-	-
Stage 1	559	-	-	-	-
Stage 2	777	-	-	-	-

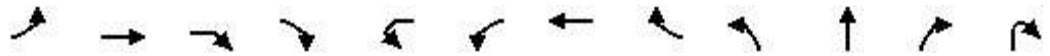
Approach	WB	NB	SB
HCM Control Delay, s	15	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	435	1042
HCM Lane V/C Ratio	-	-	0.17	0.022
HCM Control Delay (s)	-	-	15	8.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	102	248	152	71	71	144	569	10	171	224	74	19
Future Volume (vph)	102	248	152	71	71	144	569	10	171	224	74	19
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0			175		0	140		200	
Storage Lanes	1		0			1		0	1		2	
Taper Length (ft)	25					25			25			
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt		0.929					0.997				0.850	0.850
Flt Protected	0.950					0.950			0.950			
Satd. Flow (prot)	1770	3288	0	0	0	1770	3529	0	1770	1863	1583	1583
Flt Permitted	0.227					0.230			0.468			
Satd. Flow (perm)	423	3288	0	0	0	428	3529	0	872	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												199
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			439		
Travel Time (s)		22.6					18.2			12.0		
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
Adj. Flow (vph)	111	270	165	77	77	157	618	11	186	243	80	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	111	512	0	0	0	234	629	0	186	243	80	21
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA			Perm	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2				1	6		7	4		
Permitted Phases	2				6	6			4		4	Free
Minimum Split (s)	10.5	36.0			30.0	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	13.0	36.4			40.5	17.1	40.5		11.0	36.0	36.0	
Total Split (%)	9.3%	26.0%			28.9%	12.2%	28.9%		7.9%	25.7%	25.7%	
Maximum Green (s)	7.5	30.4			34.5	11.6	34.5		5.5	30.0	30.0	
Yellow Time (s)	3.5	4.0			4.0	3.5	4.0		3.5	4.0	4.0	
All-Red Time (s)	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	
Total Lost Time (s)	5.5	6.0				5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag			Lag	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0			10.0		10.0			10.0	10.0	
Flash Dont Walk (s)		20.0			14.0		14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0			0	0	
Act Effct Green (s)	38.4	30.4				46.6	34.5		36.0	30.0	30.0	140.0
Actuated g/C Ratio	0.27	0.22				0.33	0.25		0.26	0.21	0.21	1.00
v/c Ratio	0.59	0.72				0.92	0.72		0.72	0.61	0.24	0.01

HY PM No Build

Synchro 10 Report

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	22	116	216	151	6	251	85	124
Future Volume (vph)	22	116	216	151	6	251	85	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.347				0.950		
Satd. Flow (perm)	0	646	1863	1583	0	3433	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				135				199
Link Speed (mph)			35			35		
Link Distance (ft)			1258			357		
Travel Time (s)			24.5			7.0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	126	235	164	7	273	92	135
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	150	235	164	0	280	92	135
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	14.0	14.0	39.0	13.0	36.5	36.5	36.5	
Total Split (%)	10.0%	10.0%	27.9%	9.3%	26.1%	26.1%	26.1%	
Maximum Green (s)	8.5	8.5	33.0	7.5	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		42.0	33.0	41.0		31.0	31.0	140.0
Actuated g/C Ratio		0.30	0.24	0.29		0.22	0.22	1.00
v/c Ratio		0.57	0.54	0.29		0.37	0.26	0.09

HY PM No Build

Synchro 10 Report

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020

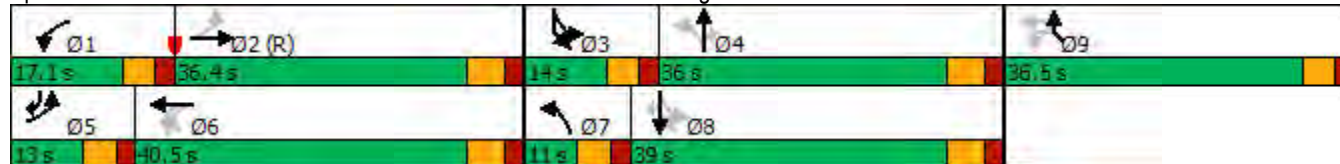


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Control Delay	47.6	57.4				78.4	54.0		59.0	57.1	47.8	0.0
Queue Delay	0.0	0.0				0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	47.6	57.4				78.4	54.0		59.0	57.1	47.8	0.0
LOS	D	E				E	D		E	E	D	A
Approach Delay		55.6					60.6			54.1		
Approach LOS		E					E			D		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	135
Control Type:	Pretimed
Maximum v/c Ratio:	0.92
Intersection Signal Delay:	50.0
Intersection LOS:	D
Intersection Capacity Utilization	77.9%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		46.1	52.1	6.1		47.9	47.5	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		46.1	52.1	6.1		47.9	47.5	0.1
LOS		D	D	A		D	D	A
Approach Delay			36.7			35.1		
Approach LOS			D			D		
Intersection Summary								

Lanes, Volumes, Timings

18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	154	33	80	322	252	136
Future Volume (vph)	154	33	80	322	252	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110	110	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Frt		0.850			0.947	
Flt Protected	0.950			0.990		
Satd. Flow (prot)	1770	1583	0	3504	3352	0
Flt Permitted	0.950			0.775		
Satd. Flow (perm)	1770	1583	0	2743	3352	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		36			107	
Link Speed (mph)	25			35	35	
Link Distance (ft)	368			1084	526	
Travel Time (s)	10.0			21.1	10.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	167	36	87	350	274	148
Shared Lane Traffic (%)						
Lane Group Flow (vph)	167	36	0	437	422	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			

HY PM No Build

Synchro 10 Report

Lanes, Volumes, Timings
 18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020

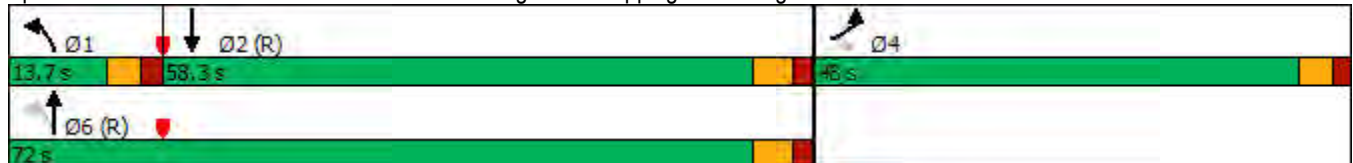


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	1	6	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0	7.0	10.0	10.0	
Minimum Split (s)	26.8	26.8	12.6	27.6	35.6	
Total Split (s)	48.0	48.0	13.7	72.0	58.3	
Total Split (%)	40.0%	40.0%	11.4%	60.0%	48.6%	
Maximum Green (s)	43.2	43.2	8.7	66.4	52.7	
Yellow Time (s)	3.0	3.0	3.0	3.6	3.6	
All-Red Time (s)	1.8	1.8	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.8	4.8		5.6	5.6	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effect Green (s)	16.8	16.8		92.8	92.8	
Actuated g/C Ratio	0.14	0.14		0.77	0.77	
v/c Ratio	0.68	0.14		0.21	0.16	
Control Delay	62.1	14.2		13.0	3.0	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	62.1	14.2		13.0	3.0	
LOS	E	B		B	A	
Approach Delay	53.6			13.0	3.0	
Approach LOS	D			B	A	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 16.8
 Intersection LOS: B
 Intersection Capacity Utilization 44.4%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 18: Northwest Boulevard & Kingsdale Shopping Center Signal



Timing Report, Sorted By Phase
7: Tremont Road & Zollinger Road

09/21/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	70	50	70	50
Maximum Split (%)	58.3%	41.7%	58.3%	41.7%
Minimum Split (s)	42	29.5	42	29.5
Yellow Time (s)	4	3.5	4	3.5
All-Red Time (s)	2	1	2	1
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	12	8	12	8
Flash Dont Walk (s)	24	17	24	17
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	70	0	70
End Time (s)	70	0	70	0
Yield/Force Off (s)	64	115.5	64	115.5
Yield/Force Off 170(s)	40	98.5	40	98.5
Local Start Time (s)	0	70	0	70
Local Yield (s)	64	115.5	64	115.5
Local Yield 170(s)	40	98.5	40	98.5

Intersection Summary

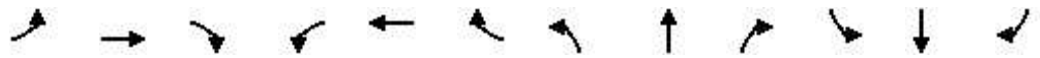
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 7: Tremont Road & Zollinger Road



HCM 6th Signalized Intersection Summary
 7: Tremont Road & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	169	48	54	200	56	37	355	43	34	330	137
Future Volume (veh/h)	131	169	48	54	200	56	37	355	43	34	330	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	142	184	52	59	217	61	40	386	47	37	359	149
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	229	827	227	345	422	119	606	1001	122	530	769	319
Arrive On Green	0.30	0.30	0.30	0.10	0.10	0.10	0.61	0.61	0.61	1.00	1.00	1.00
Sat Flow, veh/h	1101	2754	757	1144	1404	395	891	1635	199	955	1255	521
Grp Volume(v), veh/h	142	117	119	59	0	278	40	0	433	37	0	508
Grp Sat Flow(s),veh/h/ln	1101	1777	1734	1144	0	1799	891	0	1835	955	0	1777
Q Serve(g_s), s	15.0	5.9	6.2	5.8	0.0	17.6	2.2	0.0	14.4	1.0	0.0	0.0
Cycle Q Clear(g_c), s	32.6	5.9	6.2	12.0	0.0	17.6	2.2	0.0	14.4	15.3	0.0	0.0
Prop In Lane	1.00		0.44	1.00		0.22	1.00		0.11	1.00		0.29
Lane Grp Cap(c), veh/h	229	534	521	345	0	540	606	0	1123	530	0	1088
V/C Ratio(X)	0.62	0.22	0.23	0.17	0.00	0.51	0.07	0.00	0.39	0.07	0.00	0.47
Avail Cap(c_a), veh/h	316	674	657	435	0	682	606	0	1123	530	0	1088
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	1.00	1.00	0.68	0.00	0.68	1.00	0.00	1.00	0.96	0.00	0.96
Uniform Delay (d), s/veh	49.3	31.4	31.5	46.1	0.0	45.8	9.4	0.0	11.8	1.5	0.0	0.0
Incr Delay (d2), s/veh	2.7	0.2	0.2	0.2	0.0	0.5	0.2	0.0	1.0	0.2	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	2.6	2.6	1.8	0.0	8.6	0.5	0.0	6.1	0.1	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.1	31.7	31.8	46.3	0.0	46.3	9.7	0.0	12.8	1.7	0.0	1.4
LnGrp LOS	D	C	C	D	A	D	A	A	B	A	A	A
Approach Vol, veh/h		378			337			473			545	
Approach Delay, s/veh		39.4			46.3			12.5			1.4	
Approach LOS		D			D			B			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		79.5		40.5		79.5		40.5				
Change Period (Y+Rc), s		6.0		4.5		6.0		4.5				
Max Green Setting (Gmax), s		64.0		45.5		64.0		45.5				
Max Q Clear Time (g_c+I1), s		16.4		34.6		17.3		19.6				
Green Ext Time (p_c), s		3.6		1.4		4.4		1.9				
Intersection Summary												
HCM 6th Ctrl Delay				21.4								
HCM 6th LOS				C								

Timing Report, Sorted By Phase

8: Northwest Boulevard & Zollinger Road

09/21/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	37	25	32	26
Maximum Split (%)	30.8%	20.8%	26.7%	21.7%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	69	37	94
End Time (s)	37	94	69	0
Yield/Force Off (s)	32	89	64	115
Yield/Force Off 170(s)	21	78	53	104
Local Start Time (s)	0	69	37	94
Local Yield (s)	32	89	64	115
Local Yield 170(s)	21	78	53	104

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
8: Northwest Boulevard & Zollinger Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	58	170	98	17	135	91	89	314	55	78	299	66
Future Volume (veh/h)	58	170	98	17	135	91	89	314	55	78	299	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	63	185	107	18	147	99	97	341	60	85	325	72
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	77	232	139	22	181	174	251	925	170	137	548	127
Arrive On Green	0.04	0.04	0.04	0.11	0.11	0.11	0.37	0.37	0.37	0.07	0.07	0.07
Sat Flow, veh/h	607	1815	1092	203	1657	1585	677	2491	457	611	2434	563
Grp Volume(v), veh/h	191	0	164	165	0	99	263	0	235	256	0	226
Grp Sat Flow(s),veh/h/ln	1840	0	1674	1860	0	1585	1837	0	1788	1840	0	1769
Q Serve(g_s), s	12.4	0.0	11.6	10.4	0.0	7.1	12.6	0.0	11.4	16.2	0.0	14.8
Cycle Q Clear(g_c), s	12.4	0.0	11.6	10.4	0.0	7.1	12.6	0.0	11.4	16.2	0.0	14.8
Prop In Lane	0.33		0.65	0.11		1.00	0.37		0.26	0.33		0.32
Lane Grp Cap(c), veh/h	235	0	214	204	0	174	682	0	664	414	0	398
V/C Ratio(X)	0.81	0.00	0.77	0.81	0.00	0.57	0.39	0.00	0.35	0.62	0.00	0.57
Avail Cap(c_a), veh/h	307	0	279	326	0	277	682	0	664	414	0	398
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	0.97	0.00	0.97	1.00	0.00	1.00	1.00	0.00	1.00	0.99	0.00	0.99
Uniform Delay (d), s/veh	56.1	0.0	55.7	52.2	0.0	50.8	27.7	0.0	27.3	50.5	0.0	49.9
Incr Delay (d2), s/veh	11.6	0.0	8.8	7.8	0.0	2.9	1.7	0.0	1.5	6.7	0.0	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	0.0	5.8	5.3	0.0	2.9	5.8	0.0	5.1	8.8	0.0	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.7	0.0	64.5	60.1	0.0	53.7	29.3	0.0	28.8	57.3	0.0	55.6
LnGrp LOS	E	A	E	E	A	D	C	A	C	E	A	E
Approach Vol, veh/h		355			264			498				482
Approach Delay, s/veh		66.2			57.7			29.1				56.5
Approach LOS		E			E			C				E
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.6		20.3		32.0		18.1				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		32.0		20.0		27.0		21.0				
Max Q Clear Time (g_c+I1), s		14.6		14.4		18.2		12.4				
Green Ext Time (p_c), s		2.7		1.0		1.8		0.7				
Intersection Summary												
HCM 6th Ctrl Delay				50.3								
HCM 6th LOS				D								

HCM 6th TWSC
 11: Tremont Road & Ridgecliff Road

09/21/2020

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	22	2	13	50	2	54	16	439	52	56	414	35
Future Vol, veh/h	22	2	13	50	2	54	16	439	52	56	414	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	190	-	-	290	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	2	14	54	2	59	17	477	57	61	450	38

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1161	1159	469	1139	1150	506	488	0	0	534	0	0
Stage 1	591	591	-	540	540	-	-	-	-	-	-	-
Stage 2	570	568	-	599	610	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	172	196	594	178	198	566	1075	-	-	1034	-	-
Stage 1	493	494	-	526	521	-	-	-	-	-	-	-
Stage 2	506	506	-	488	485	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	144	181	594	163	183	566	1075	-	-	1034	-	-
Mov Cap-2 Maneuver	144	181	-	163	183	-	-	-	-	-	-	-
Stage 1	485	465	-	518	513	-	-	-	-	-	-	-
Stage 2	444	498	-	446	456	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	27.6		29.9		0.3		1	
HCM LOS	D		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1075	-	-	199	257	1034	-	-
HCM Lane V/C Ratio	0.016	-	-	0.202	0.448	0.059	-	-
HCM Control Delay (s)	8.4	-	-	27.6	29.9	8.7	-	-
HCM Lane LOS	A	-	-	D	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	2.2	0.2	-	-

Timing Report, Sorted By Phase
 13: Tremont Road & Milden Road

09/21/2020

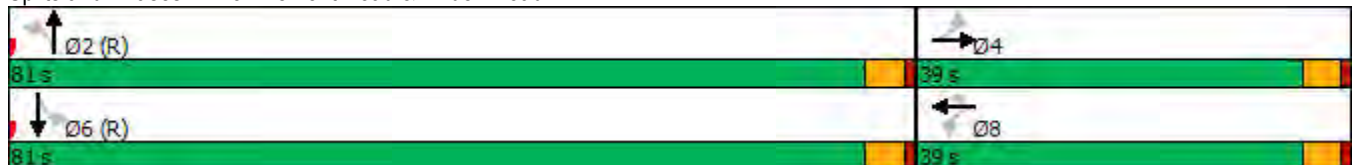


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	81	39	81	39
Maximum Split (%)	67.5%	32.5%	67.5%	32.5%
Minimum Split (s)	24.5	27.5	24.5	27.5
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	10	10	10	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	13	16	13	16
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	81	0	81
End Time (s)	81	0	81	0
Yield/Force Off (s)	76.5	115.5	76.5	115.5
Yield/Force Off 170(s)	63.5	99.5	63.5	99.5
Local Start Time (s)	0	81	0	81
Local Yield (s)	76.5	115.5	76.5	115.5
Local Yield 170(s)	63.5	99.5	63.5	99.5

Intersection Summary

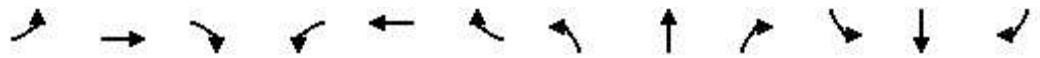
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	55
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 13: Tremont Road & Milden Road



HCM 6th Signalized Intersection Summary
 13: Tremont Road & Milden Road

09/21/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	32	16	6	90	26	88	14	373	116	95	417	15
Future Volume (veh/h)	32	16	6	90	26	88	14	373	116	95	417	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	35	17	7	98	28	96	15	405	126	103	453	16
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	85	37	10	191	42	222	718	1074	334	745	1409	50
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	1.00	1.00	1.00	0.78	0.78	0.78
Sat Flow, veh/h	269	262	71	986	297	1585	924	1368	426	873	1796	63
Grp Volume(v), veh/h	59	0	0	126	0	96	15	0	531	103	0	469
Grp Sat Flow(s),veh/h/ln	602	0	0	1283	0	1585	924	0	1794	873	0	1859
Q Serve(g_s), s	3.1	0.0	0.0	0.0	0.0	6.7	0.2	0.0	0.0	3.5	0.0	8.7
Cycle Q Clear(g_c), s	14.6	0.0	0.0	11.5	0.0	6.7	8.9	0.0	0.0	3.5	0.0	8.7
Prop In Lane	0.59		0.12	0.78		1.00	1.00		0.24	1.00		0.03
Lane Grp Cap(c), veh/h	132	0	0	233	0	222	718	0	1408	745	0	1459
V/C Ratio(X)	0.45	0.00	0.00	0.54	0.00	0.43	0.02	0.00	0.38	0.14	0.00	0.32
Avail Cap(c_a), veh/h	344	0	0	450	0	456	718	0	1408	745	0	1459
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	1.00	0.82	0.00	0.82	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.9	0.0	0.0	49.3	0.0	47.2	0.4	0.0	0.0	3.1	0.0	3.7
Incr Delay (d2), s/veh	2.3	0.0	0.0	1.9	0.0	1.3	0.0	0.0	0.6	0.4	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.0	3.8	0.0	2.7	0.0	0.0	0.2	0.6	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.3	0.0	0.0	51.2	0.0	48.5	0.5	0.0	0.6	3.5	0.0	4.3
LnGrp LOS	D	A	A	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		59			222			546			572	
Approach Delay, s/veh		54.3			50.1			0.6			4.2	
Approach LOS		D			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		98.7		21.3		98.7		21.3				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		76.5		34.5		76.5		34.5				
Max Q Clear Time (g_c+I1), s		10.9		16.6		10.7		13.5				
Green Ext Time (p_c), s		4.5		0.2		4.4		1.0				
Intersection Summary												
HCM 6th Ctrl Delay				12.2								
HCM 6th LOS				B								

HCM 6th TWSC
 16: Northwest Boulevard & Trentwood Road

09/21/2020

Intersection						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	48	27	487	44	21	399
Future Vol, veh/h	48	27	487	44	21	399
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	52	29	529	48	23	434

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	816	289	0	0	577	0
Stage 1	553	-	-	-	-	-
Stage 2	263	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	315	708	-	-	993	-
Stage 1	540	-	-	-	-	-
Stage 2	757	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	305	708	-	-	993	-
Mov Cap-2 Maneuver	305	-	-	-	-	-
Stage 1	523	-	-	-	-	-
Stage 2	757	-	-	-	-	-

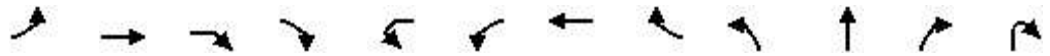
Approach	WB	NB	SB
HCM Control Delay, s	16.9	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	384	993
HCM Lane V/C Ratio	-	-	0.212	0.023
HCM Control Delay (s)	-	-	16.9	8.7
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.8	0.1

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	102	246	171	83	78	160	567	10	183	250	74	33
Future Volume (vph)	102	246	171	83	78	160	567	10	183	250	74	33
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0			175		0	140		200	
Storage Lanes	1		0			1		0	1		2	
Taper Length (ft)	25					25			25			
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt		0.924					0.997				0.850	0.850
Flt Protected	0.950					0.950			0.950			
Satd. Flow (prot)	1770	3270	0	0	0	1770	3529	0	1770	1863	1583	1583
Flt Permitted	0.222					0.209			0.429			
Satd. Flow (perm)	414	3270	0	0	0	389	3529	0	799	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												199
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			495		
Travel Time (s)		22.6					18.2			13.5		
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
Adj. Flow (vph)	111	267	186	90	85	174	616	11	199	272	80	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	111	543	0	0	0	259	627	0	199	272	80	36
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA			Perm	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2				1	6		7	4		
Permitted Phases	2				6	6			4		4	Free
Minimum Split (s)	10.5	36.0			30.0	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	13.6	36.5			40.1	17.2	40.1		10.8	34.8	34.8	
Total Split (%)	9.7%	26.1%			28.6%	12.3%	28.6%		7.7%	24.9%	24.9%	
Maximum Green (s)	8.1	30.5			34.1	11.7	34.1		5.3	28.8	28.8	
Yellow Time (s)	3.5	4.0			4.0	3.5	4.0		3.5	4.0	4.0	
All-Red Time (s)	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	
Total Lost Time (s)	5.5	6.0				5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag			Lag	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0			10.0		10.0			10.0	10.0	
Flash Dont Walk (s)		20.0			14.0		14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0			0	0	
Act Effct Green (s)	39.1	30.5				46.3	34.1		34.6	28.8	28.8	140.0
Actuated g/C Ratio	0.28	0.22				0.33	0.24		0.25	0.21	0.21	1.00
v/c Ratio	0.57	0.76				1.06	0.73		0.85	0.71	0.25	0.02

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	22	133	242	151	6	270	102	133
Future Volume (vph)	22	133	242	151	6	270	102	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.269				0.950		
Satd. Flow (perm)	0	501	1863	1583	0	3433	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				118				199
Link Speed (mph)			35			35		
Link Distance (ft)			1258			352		
Travel Time (s)			24.5			6.9		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	145	263	164	7	293	111	145
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	169	263	164	0	300	111	145
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	15.0	15.0	39.0	13.6	36.5	36.5	36.5	
Total Split (%)	10.7%	10.7%	27.9%	9.7%	26.1%	26.1%	26.1%	
Maximum Green (s)	9.5	9.5	33.0	8.1	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		43.0	33.0	41.6		31.0	31.0	140.0
Actuated g/C Ratio		0.31	0.24	0.30		0.22	0.22	1.00
v/c Ratio		0.71	0.60	0.30		0.39	0.32	0.09

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020

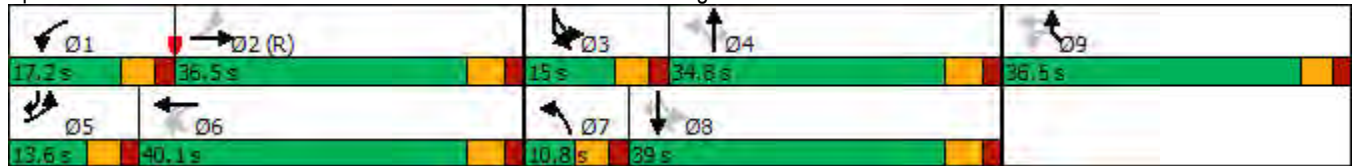


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Control Delay	45.7	59.4				112.3	54.5		75.6	63.1	48.9	0.0
Queue Delay	0.0	0.0				0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	45.7	59.4				112.3	54.5		75.6	63.1	48.9	0.0
LOS	D	E				F	D		E	E	D	A
Approach Delay		57.0					71.4			61.5		
Approach LOS		E					E			E		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	135
Control Type:	Pretimed
Maximum v/c Ratio:	1.06
Intersection Signal Delay:	55.3
Intersection LOS:	E
Intersection Capacity Utilization	82.6%
ICU Level of Service	E
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/21/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		54.6	54.2	7.5		48.3	48.6	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		54.6	54.2	7.5		48.3	48.6	0.1
LOS		D	D	A		D	D	A
Approach Delay			41.5			35.8		
Approach LOS			D			D		
Intersection Summary								

Lanes, Volumes, Timings

18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	208	94	143	320	251	187
Future Volume (vph)	208	94	143	320	251	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110	110	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Frt		0.850			0.936	
Flt Protected	0.950			0.985		
Satd. Flow (prot)	1770	1583	0	3486	3313	0
Flt Permitted	0.950			0.679		
Satd. Flow (perm)	1770	1583	0	2403	3313	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		102			196	
Link Speed (mph)	25			35	35	
Link Distance (ft)	368			1084	520	
Travel Time (s)	10.0			21.1	10.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	226	102	155	348	273	203
Shared Lane Traffic (%)						
Lane Group Flow (vph)	226	102	0	503	476	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	
Detector Template	Left	Right	Left	Thru	Thru	
Leading Detector (ft)	20	20	20	100	100	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	20	20	6	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			

Lanes, Volumes, Timings
 18: Northwest Boulevard & Kingsdale Shopping Center Signal

09/21/2020

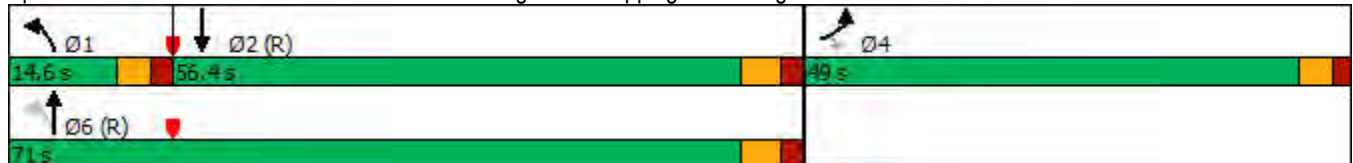


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	1	6	2	
Switch Phase						
Minimum Initial (s)	8.0	8.0	7.0	10.0	10.0	
Minimum Split (s)	26.8	26.8	12.6	27.6	35.6	
Total Split (s)	49.0	49.0	14.6	71.0	56.4	
Total Split (%)	40.8%	40.8%	12.2%	59.2%	47.0%	
Maximum Green (s)	44.2	44.2	9.6	65.4	50.8	
Yellow Time (s)	3.0	3.0	3.0	3.6	3.6	
All-Red Time (s)	1.8	1.8	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.8	4.8		5.6	5.6	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	23.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effect Green (s)	20.9	20.9		88.7	88.7	
Actuated g/C Ratio	0.17	0.17		0.74	0.74	
v/c Ratio	0.73	0.28		0.28	0.19	
Control Delay	60.4	9.3		17.6	3.3	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	60.4	9.3		17.6	3.3	
LOS	E	A		B	A	
Approach Delay	44.5			17.6	3.3	
Approach LOS	D			B	A	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 19.1
 Intersection LOS: B
 Intersection Capacity Utilization 50.8%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

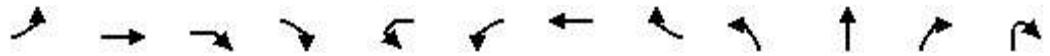


Capacity Analysis with Improvements

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	153	695	128	59	25	83	241	9	97	160	152	25
Future Volume (vph)	153	695	128	59	25	83	241	9	97	160	152	25
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		465			175		0	140		200	
Storage Lanes	1		1			1		0	1		2	
Taper Length (ft)	25					25			25			
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850				0.994				0.850	0.850
Flt Protected	0.950					0.950			0.950			
Satd. Flow (prot)	1770	3539	1583	0	0	1770	3518	0	1770	1863	1583	1583
Flt Permitted	0.483					0.138			0.533			
Satd. Flow (perm)	900	3539	1583	0	0	257	3518	0	993	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												242
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			440		
Travel Time (s)		22.6					18.2			12.0		
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
Adj. Flow (vph)	166	755	139	64	27	90	262	10	105	174	165	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	166	755	203	0	0	117	272	0	105	174	165	27
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA	Perm		Perm	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2				1	6		7	4		
Permitted Phases	2		2		6	6			4		4	Free
Minimum Split (s)	10.5	36.0	36.0		30.0	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	15.0	41.9	41.9		38.9	12.0	38.9		10.6	33.4	33.4	
Total Split (%)	10.7%	29.9%	29.9%		27.8%	8.6%	27.8%		7.6%	23.9%	23.9%	
Maximum Green (s)	9.5	35.9	35.9		32.9	6.5	32.9		5.1	27.4	27.4	
Yellow Time (s)	3.5	4.0	4.0		4.0	3.5	4.0		3.5	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	
Lost Time Adjust (s)	0.0	0.0	0.0			0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.5	6.0	6.0			5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag	Lag		Lag	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0	10.0		10.0		10.0			10.0	10.0	
Flash Dont Walk (s)		20.0	20.0		14.0		14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0	0		0		0			0	0	
Act Effct Green (s)	45.9	35.9	35.9			39.9	32.9		33.0	27.4	27.4	140.0
Actuated g/C Ratio	0.33	0.26	0.26			0.28	0.24		0.24	0.20	0.20	1.00
v/c Ratio	0.47	0.83	0.50			0.82	0.33		0.40	0.48	0.53	0.02

OY AM No Build with Improvements

Synchro 10 Report

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	73	143	208	99	1	142	63	75
Future Volume (vph)	73	143	208	99	1	142	63	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.420				0.954		
Satd. Flow (perm)	0	782	1863	1583	0	3447	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				109				242
Link Speed (mph)			35			35		
Link Distance (ft)			1258			362		
Travel Time (s)			24.5			7.1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	155	226	108	1	154	68	82
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	234	226	108	0	155	68	82
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	16.2	16.2	39.0	15.0	36.5	36.5	36.5	
Total Split (%)	11.6%	11.6%	27.9%	10.7%	26.1%	26.1%	26.1%	
Maximum Green (s)	10.7	10.7	33.0	9.5	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		44.1	33.0	43.0		31.0	31.0	140.0
Actuated g/C Ratio		0.32	0.24	0.31		0.22	0.22	1.00
v/c Ratio		0.73	0.51	0.19		0.20	0.19	0.05

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020

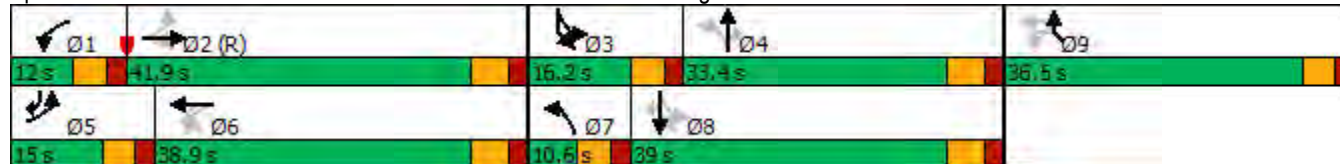


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Control Delay	38.6	58.4	49.5			75.2	45.7		43.3	55.0	57.8	0.0
Queue Delay	0.0	0.0	0.0			0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	38.6	58.4	49.5			75.2	45.7		43.3	55.0	57.8	0.0
LOS	D	E	D			E	D		D	E	E	A
Approach Delay		53.8					54.6			50.2		
Approach LOS		D					D			D		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	135
Control Type:	Pretimed
Maximum v/c Ratio:	0.83
Intersection Signal Delay:	49.1
Intersection LOS:	D
Intersection Capacity Utilization	76.2%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		53.7	51.4	3.9		45.3	46.2	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		53.7	51.4	3.9		45.3	46.2	0.1
LOS		D	D	A		D	D	A
Approach Delay			43.3			33.3		
Approach LOS			D			C		
Intersection Summary								

Timing Report, Sorted By Phase
 8: Northwest Boulevard & Zollinger Road

09/22/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	37	33	30	33
Maximum Split (%)	37.0%	33.0%	30.0%	33.0%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	67	37	67
End Time (s)	37	0	67	0
Yield/Force Off (s)	32	95	62	95
Yield/Force Off 170(s)	21	84	51	84
Local Start Time (s)	0	67	37	67
Local Yield (s)	32	95	62	95
Local Yield 170(s)	21	84	51	84

Intersection Summary

Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
8: Northwest Boulevard & Zollinger Road

09/22/2020

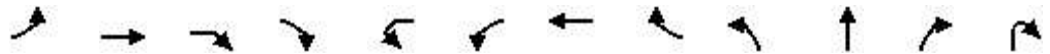


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	31	105	75	24	77	18	84	177	34	20	156	32
Future Volume (veh/h)	31	105	75	24	77	18	84	177	34	20	156	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	114	82	26	84	20	91	192	37	22	170	35
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	73	194	144	69	168	215	457	1018	203	85	676	144
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.46	0.46	0.46	0.08	0.08	0.08
Sat Flow, veh/h	196	1434	1062	181	1241	1585	985	2191	437	340	2702	578
Grp Volume(v), veh/h	113	0	117	110	0	20	168	0	152	120	0	107
Grp Sat Flow(s),veh/h/ln	1181	0	1511	1422	0	1585	1821	0	1792	1853	0	1766
Q Serve(g_s), s	2.3	0.0	7.2	0.9	0.0	1.1	5.5	0.0	5.0	6.1	0.0	5.7
Cycle Q Clear(g_c), s	10.5	0.0	7.2	8.2	0.0	1.1	5.5	0.0	5.0	6.1	0.0	5.7
Prop In Lane	0.30		0.70	0.24		1.00	0.54		0.24	0.18		0.33
Lane Grp Cap(c), veh/h	207	0	205	237	0	215	846	0	832	463	0	442
V/C Ratio(X)	0.55	0.00	0.57	0.46	0.00	0.09	0.20	0.00	0.18	0.26	0.00	0.24
Avail Cap(c_a), veh/h	445	0	423	475	0	444	846	0	832	463	0	442
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	0.94	0.00	0.94	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.2	0.0	40.5	40.0	0.0	37.8	15.8	0.0	15.7	37.2	0.0	37.0
Incr Delay (d2), s/veh	2.1	0.0	2.3	1.4	0.0	0.2	0.5	0.0	0.5	1.4	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	2.8	2.6	0.0	0.4	2.3	0.0	2.1	3.0	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.3	0.0	42.8	41.4	0.0	38.0	16.3	0.0	16.2	38.5	0.0	38.3
LnGrp LOS	D	A	D	D	A	D	B	A	B	D	A	D
Approach Vol, veh/h		230			130			320				227
Approach Delay, s/veh		43.1			40.9			16.2				38.4
Approach LOS		D			D			B				D
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		51.4		18.6		30.0		18.6				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		32.0		28.0		25.0		28.0				
Max Q Clear Time (g_c+I1), s		7.5		12.5		8.1		10.2				
Green Ext Time (p_c), s		1.8		1.1		1.1		0.5				
Intersection Summary												
HCM 6th Ctrl Delay				32.1								
HCM 6th LOS				C								

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	153	695	146	68	32	97	241	9	105	180	152	36
Future Volume (vph)	153	695	146	68	32	97	241	9	105	180	152	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		390				175	0	140		200	
Storage Lanes	1		2				2	0	1		2	
Taper Length (ft)	25						25		25			
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850	0.850			0.994				0.850	0.850
Flt Protected	0.950				0.950	0.950			0.950			
Satd. Flow (prot)	1770	3539	1583	1583	1770	1770	3518	0	1770	1863	1583	1583
Flt Permitted	0.427				0.140	0.140			0.485			
Satd. Flow (perm)	795	3539	1583	1583	261	261	3518	0	903	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												284
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			455		
Travel Time (s)		22.6					18.2			12.4		
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
Adj. Flow (vph)	166	755	159	74	35	105	262	10	114	196	165	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	166	755	159	74	35	105	272	0	114	196	165	39
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		24					24			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA	Perm	Free	pm+pt	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2			1	1	6		7	4		
Permitted Phases	2		2	Free	6	6			4		4	Free
Minimum Split (s)	10.5	36.0	36.0		10.5	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	18.0	40.5	40.5		12.0	12.0	34.5		11.8	33.0	33.0	
Total Split (%)	12.9%	28.9%	28.9%		8.6%	8.6%	24.6%		8.4%	23.6%	23.6%	
Maximum Green (s)	12.5	34.5	34.5		6.5	6.5	28.5		6.3	27.0	27.0	
Yellow Time (s)	3.5	4.0	4.0		3.5	3.5	4.0		3.5	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	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.5	6.0	6.0		5.5	5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag	Lag		Lead	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0	10.0				10.0			10.0	10.0	
Flash Dont Walk (s)		20.0	20.0				14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0	0				0			0	0	
Act Effct Green (s)	47.0	34.5	34.5	140.0	35.5	35.5	28.5		33.8	27.0	27.0	140.0
Actuated g/C Ratio	0.34	0.25	0.25	1.00	0.25	0.25	0.20		0.24	0.19	0.19	1.00
v/c Ratio	0.47	0.87	0.41	0.05	0.26	0.77	0.38		0.44	0.55	0.54	0.02

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020

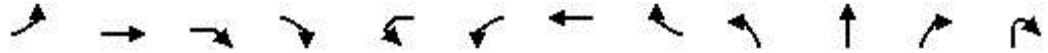


Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations		↓	↑	↑		↑	↑	↑
Traffic Volume (vph)	73	159	233	99	1	156	76	81
Future Volume (vph)	73	159	233	99	1	156	76	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.375				0.954		
Satd. Flow (perm)	0	699	1863	1583	0	3447	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				109				284
Link Speed (mph)			35			35		
Link Distance (ft)			1258			336		
Travel Time (s)			24.5			6.5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	173	253	108	1	170	83	88
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	252	253	108	0	171	83	88
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	18.0	18.0	39.2	18.0	36.5	36.5	36.5	
Total Split (%)	12.9%	12.9%	28.0%	12.9%	26.1%	26.1%	26.1%	
Maximum Green (s)	12.5	12.5	33.2	12.5	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		45.5	33.2	46.2		31.0	31.0	140.0
Actuated g/C Ratio		0.32	0.24	0.33		0.22	0.22	1.00
v/c Ratio		0.78	0.57	0.18		0.22	0.24	0.06

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020

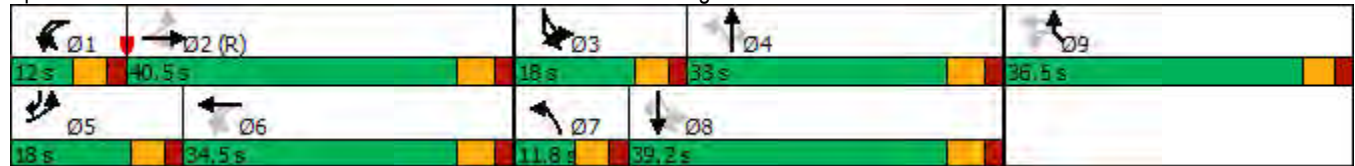


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Control Delay	39.1	62.0	48.0	0.1	37.0	70.9	50.0		42.8	57.5	58.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	39.1	62.0	48.0	0.1	37.0	70.9	50.0		42.8	57.5	58.4	0.0
LOS	D	E	D	A	D	E	D		D	E	E	A
Approach Delay		52.8					54.2			50.2		
Approach LOS		D					D			D		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	135
Control Type:	Pretimed
Maximum v/c Ratio:	0.87
Intersection Signal Delay:	49.0
Intersection LOS:	D
Intersection Capacity Utilization	76.5%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		56.6	53.1	3.5		45.6	47.0	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		56.6	53.1	3.5		45.6	47.0	0.1
LOS		E	D	A		D	D	A
Approach Delay		45.8				34.2		
Approach LOS		D				C		
Intersection Summary								

Timing Report, Sorted By Phase

8: Northwest Boulevard & Zollinger Road

09/22/2020

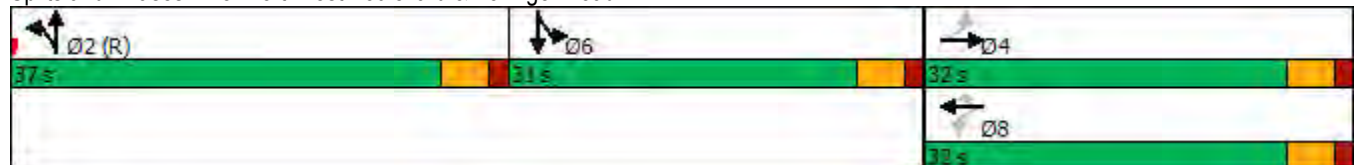


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	37	32	31	32
Maximum Split (%)	37.0%	32.0%	31.0%	32.0%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	68	37	68
End Time (s)	37	0	68	0
Yield/Force Off (s)	32	95	63	95
Yield/Force Off 170(s)	21	84	52	84
Local Start Time (s)	0	68	37	68
Local Yield (s)	32	95	63	95
Local Yield 170(s)	21	84	52	84

Intersection Summary

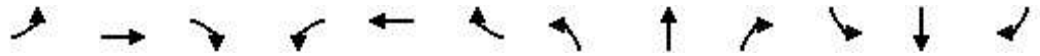
Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
 8: Northwest Boulevard & Zollinger Road

09/22/2020

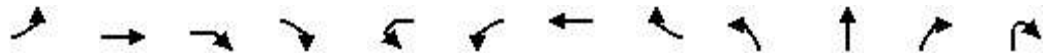


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	31	105	75	24	77	37	84	216	34	35	187	32
Future Volume (veh/h)	31	105	75	24	77	37	84	216	34	35	187	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	114	82	26	84	40	91	235	37	38	203	35
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	73	194	144	69	168	215	396	1077	176	125	694	125
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.45	0.45	0.45	0.09	0.09	0.09
Sat Flow, veh/h	195	1430	1061	181	1239	1585	871	2369	387	482	2670	479
Grp Volume(v), veh/h	113	0	117	110	0	40	191	0	172	146	0	130
Grp Sat Flow(s),veh/h/ln	1174	0	1511	1420	0	1585	1827	0	1801	1846	0	1784
Q Serve(g_s), s	2.4	0.0	7.2	0.9	0.0	2.2	6.4	0.0	5.8	7.4	0.0	6.8
Cycle Q Clear(g_c), s	10.5	0.0	7.2	8.2	0.0	2.2	6.4	0.0	5.8	7.4	0.0	6.8
Prop In Lane	0.30		0.70	0.24		1.00	0.48		0.21	0.26		0.27
Lane Grp Cap(c), veh/h	206	0	205	237	0	215	830	0	818	480	0	464
V/C Ratio(X)	0.55	0.00	0.57	0.46	0.00	0.19	0.23	0.00	0.21	0.30	0.00	0.28
Avail Cap(c_a), veh/h	426	0	408	458	0	428	830	0	818	480	0	464
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.96	0.00	0.96	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.2	0.0	40.5	40.0	0.0	38.3	16.6	0.0	16.5	37.2	0.0	37.0
Incr Delay (d2), s/veh	2.2	0.0	2.4	1.4	0.0	0.4	0.6	0.0	0.6	1.6	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	2.8	2.6	0.0	0.9	2.7	0.0	2.4	3.7	0.0	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.4	0.0	42.9	41.4	0.0	38.7	17.3	0.0	17.0	38.8	0.0	38.5
LnGrp LOS	D	A	D	D	A	D	B	A	B	D	A	D
Approach Vol, veh/h		230			150			363				276
Approach Delay, s/veh		43.1			40.7			17.2				38.7
Approach LOS		D			D			B				D
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		50.5		18.5		31.0		18.5				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		32.0		27.0		26.0		27.0				
Max Q Clear Time (g_c+I1), s		8.4		12.5		9.4		10.2				
Green Ext Time (p_c), s		2.0		1.0		1.3		0.6				
Intersection Summary												
HCM 6th Ctrl Delay				32.3								
HCM 6th LOS				C								

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	97	236	144	68	68	137	542	9	163	213	71	18
Future Volume (vph)	97	236	144	68	68	137	542	9	163	213	71	18
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		465			175		0	140		200	
Storage Lanes	1		1			1		0	1		2	
Taper Length (ft)	25					25			25			
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850				0.997				0.850	0.850
Flt Protected	0.950					0.950			0.950			
Satd. Flow (prot)	1770	3539	1583	0	0	1770	3529	0	1770	1863	1583	1583
Flt Permitted	0.215					0.507			0.522			
Satd. Flow (perm)	400	3539	1583	0	0	944	3529	0	972	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												199
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			420		
Travel Time (s)		22.6					18.2			11.5		
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
Adj. Flow (vph)	105	257	157	74	74	149	589	10	177	232	77	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	257	231	0	0	223	599	0	177	232	77	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA	Perm		Perm	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2				1	6		7	4		
Permitted Phases	2		2		6	6			4		4	Free
Minimum Split (s)	10.5	36.0	36.0		30.0	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	13.2	36.5	36.5		38.3	15.0	38.3		13.0	34.2	34.2	
Total Split (%)	9.4%	26.1%	26.1%		27.4%	10.7%	27.4%		9.3%	24.4%	24.4%	
Maximum Green (s)	7.7	30.5	30.5		32.3	9.5	32.3		7.5	28.2	28.2	
Yellow Time (s)	3.5	4.0	4.0		4.0	3.5	4.0		3.5	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	
Lost Time Adjust (s)	0.0	0.0	0.0			0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.5	6.0	6.0			5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag	Lag		Lag	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0	10.0		10.0		10.0			10.0	10.0	
Flash Dont Walk (s)		20.0	20.0		14.0		14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0	0		0		0			0	0	
Act Effct Green (s)	38.7	30.5	30.5			42.3	32.3		36.2	28.2	28.2	140.0
Actuated g/C Ratio	0.28	0.22	0.22			0.30	0.23		0.26	0.20	0.20	1.00
v/c Ratio	0.57	0.33	0.67			0.65	0.74		0.60	0.62	0.24	0.01

OY PM No Build with Improvements

Synchro 10 Report

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	21	110	206	143	6	239	81	118
Future Volume (vph)	21	110	206	143	6	239	81	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.329				0.946		
Satd. Flow (perm)	0	613	1863	1583	0	3419	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				146				199
Link Speed (mph)			35			35		
Link Distance (ft)			1258			367		
Travel Time (s)			24.5			7.1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	120	224	155	7	260	88	128
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	143	224	155	0	267	88	128
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	17.8	17.8	39.0	13.2	36.5	36.5	36.5	
Total Split (%)	12.7%	12.7%	27.9%	9.4%	26.1%	26.1%	26.1%	
Maximum Green (s)	12.3	12.3	33.0	7.7	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		45.8	33.0	41.2		31.0	31.0	140.0
Actuated g/C Ratio		0.33	0.24	0.29		0.22	0.22	1.00
v/c Ratio		0.47	0.51	0.27		0.35	0.25	0.08

OY PM No Build with Improvements

Synchro 10 Report

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020

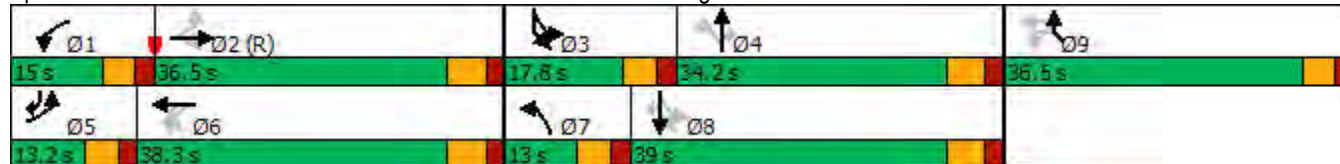


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Control Delay	47.3	47.6	61.0			48.4	56.2		48.2	59.1	49.4	0.0
Queue Delay	0.0	0.0	0.0			0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	47.3	47.6	61.0			48.4	56.2		48.2	59.1	49.4	0.0
LOS	D	D	E			D	E		D	E	D	A
Approach Delay		52.8					54.1			51.5		
Approach LOS		D					D			D		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	135
Control Type:	Pretimed
Maximum v/c Ratio:	0.74
Intersection Signal Delay:	46.7
Intersection LOS:	D
Intersection Capacity Utilization	71.3%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		39.7	51.3	4.6		47.6	47.3	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		39.7	51.3	4.6		47.6	47.3	0.1
LOS		D	D	A		D	D	A
Approach Delay			34.2			35.0		
Approach LOS			C			C		
Intersection Summary								

Timing Report, Sorted By Phase

8: Northwest Boulevard & Zollinger Road

09/22/2020

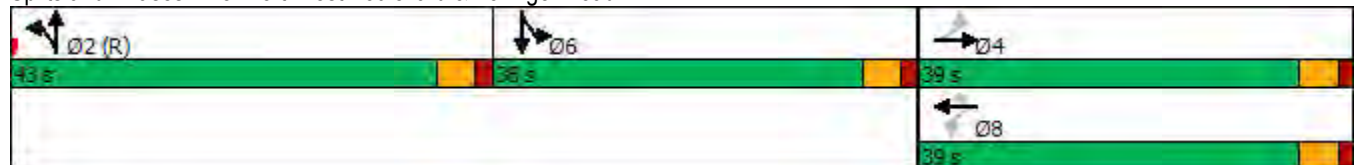


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	43	39	38	39
Maximum Split (%)	35.8%	32.5%	31.7%	32.5%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	81	43	81
End Time (s)	43	0	81	0
Yield/Force Off (s)	38	115	76	115
Yield/Force Off 170(s)	27	104	65	104
Local Start Time (s)	0	81	43	81
Local Yield (s)	38	115	76	115
Local Yield 170(s)	27	104	65	104

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
8: Northwest Boulevard & Zollinger Road

09/22/2020

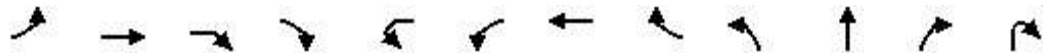


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	56	162	93	16	128	68	85	261	53	57	245	63
Future Volume (veh/h)	56	162	93	16	128	68	85	261	53	57	245	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	176	101	17	139	74	92	284	58	62	266	68
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	98	281	183	52	338	326	290	935	199	149	663	177
Arrive On Green	0.14	0.14	0.14	0.21	0.21	0.21	0.39	0.39	0.39	0.09	0.09	0.09
Sat Flow, veh/h	276	1366	888	92	1641	1585	735	2373	505	543	2412	643
Grp Volume(v), veh/h	163	0	175	156	0	74	229	0	205	211	0	185
Grp Sat Flow(s),veh/h/ln	989	0	1542	1733	0	1585	1834	0	1780	1843	0	1755
Q Serve(g_s), s	8.5	0.0	12.7	0.1	0.0	4.7	10.4	0.0	9.4	13.0	0.0	12.0
Cycle Q Clear(g_c), s	21.2	0.0	12.7	12.8	0.0	4.7	10.4	0.0	9.4	13.0	0.0	12.0
Prop In Lane	0.38		0.58	0.11		1.00	0.40		0.28	0.29		0.37
Lane Grp Cap(c), veh/h	245	0	317	390	0	326	723	0	701	507	0	483
V/C Ratio(X)	0.66	0.00	0.55	0.40	0.00	0.23	0.32	0.00	0.29	0.42	0.00	0.38
Avail Cap(c_a), veh/h	363	0	437	525	0	449	723	0	701	507	0	483
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	0.97	0.00	0.97	1.00	0.00	1.00	1.00	0.00	1.00	0.99	0.00	0.99
Uniform Delay (d), s/veh	51.6	0.0	46.6	41.3	0.0	39.7	25.2	0.0	24.9	45.4	0.0	45.0
Incr Delay (d2), s/veh	3.0	0.0	1.5	0.7	0.0	0.3	1.2	0.0	1.1	2.5	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	5.2	4.0	0.0	1.8	4.7	0.0	4.2	6.8	0.0	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.6	0.0	48.0	42.0	0.0	40.0	26.3	0.0	25.9	47.9	0.0	47.3
LnGrp LOS	D	A	D	D	A	D	C	A	C	D	A	D
Approach Vol, veh/h		338			230			434				396
Approach Delay, s/veh		51.2			41.3			26.1				47.6
Approach LOS		D			D			C				D
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		52.3		29.7		38.0		29.7				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		38.0		34.0		33.0		34.0				
Max Q Clear Time (g_c+I1), s		12.4		23.2		15.0		14.8				
Green Ext Time (p_c), s		2.6		1.4		2.1		1.0				
Intersection Summary												
HCM 6th Ctrl Delay				40.8								
HCM 6th LOS				D								

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	97	234	163	80	75	153	540	9	175	239	71	32
Future Volume (vph)	97	234	163	80	75	153	540	9	175	239	71	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		390			175		0	140		200	
Storage Lanes	1		2			1		0	1		2	
Taper Length (ft)	25					25			25			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850	0.850			0.997				0.850	0.850
Flt Protected	0.950					0.950			0.950			
Satd. Flow (prot)	1770	3539	1583	1583	0	1770	3529	0	1770	1863	1583	1583
Flt Permitted	0.220					0.507			0.420			
Satd. Flow (perm)	410	3539	1583	1583	0	944	3529	0	782	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												199
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			442		
Travel Time (s)		22.6					18.2			12.1		
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
Adj. Flow (vph)	105	254	177	87	82	166	587	10	190	260	77	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	254	177	87	0	248	597	0	190	260	77	35
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA	Perm	Free	Perm	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2				1	6		7	4		
Permitted Phases	2		2	Free	6	6			4		4	Free
Minimum Split (s)	10.5	36.0	36.0		30.0	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	13.0	36.5	36.5		38.5	15.0	38.5		13.0	37.0	37.0	
Total Split (%)	9.3%	26.1%	26.1%		27.5%	10.7%	27.5%		9.3%	26.4%	26.4%	
Maximum Green (s)	7.5	30.5	30.5		32.5	9.5	32.5		7.5	31.0	31.0	
Yellow Time (s)	3.5	4.0	4.0		4.0	3.5	4.0		3.5	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	
Lost Time Adjust (s)	0.0	0.0	0.0			0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.5	6.0	6.0			5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag	Lag		Lag	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0	10.0		10.0		10.0			10.0	10.0	
Flash Dont Walk (s)		20.0	20.0		14.0		14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0	0		0		0			0	0	
Act Effct Green (s)	38.5	30.5	30.5	140.0		42.5	32.5		39.0	31.0	31.0	140.0
Actuated g/C Ratio	0.28	0.22	0.22	1.00		0.30	0.23		0.28	0.22	0.22	1.00
v/c Ratio	0.57	0.33	0.51	0.05		0.73	0.73		0.70	0.63	0.22	0.02

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations		↓	↑	↑		↑	↑	↑
Traffic Volume (vph)	21	127	232	143	6	258	98	127
Future Volume (vph)	21	127	232	143	6	258	98	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.337				0.947		
Satd. Flow (perm)	0	628	1863	1583	0	3422	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				130				199
Link Speed (mph)			35			35		
Link Distance (ft)			1258			355		
Travel Time (s)			24.5			6.9		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	138	252	155	7	280	107	138
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	161	252	155	0	287	107	138
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	15.0	15.0	39.0	13.0	36.5	36.5	36.5	
Total Split (%)	10.7%	10.7%	27.9%	9.3%	26.1%	26.1%	26.1%	
Maximum Green (s)	9.5	9.5	33.0	7.5	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		43.0	33.0	41.0		31.0	31.0	140.0
Actuated g/C Ratio		0.31	0.24	0.29		0.22	0.22	1.00
v/c Ratio		0.60	0.57	0.28		0.38	0.31	0.09

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020

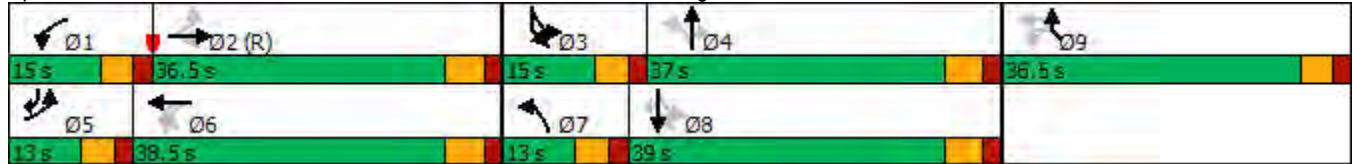


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Control Delay	47.5	47.6	54.4	0.1		52.9	55.7		54.3	57.2	46.6	0.0
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	47.5	47.6	54.4	0.1		52.9	55.7		54.3	57.2	46.6	0.0
LOS	D	D	D	A		D	E		D	E	D	A
Approach Delay		42.8					54.9			51.2		
Approach LOS		D					D			D		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	135
Control Type:	Pretimed
Maximum v/c Ratio:	0.73
Intersection Signal Delay:	45.5
Intersection LOS:	D
Intersection Capacity Utilization	74.2%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		45.4	53.3	5.9		48.1	48.4	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		45.4	53.3	5.9		48.1	48.4	0.1
LOS		D	D	A		D	D	A
Approach Delay			38.1			35.7		
Approach LOS			D			D		
Intersection Summary								

Timing Report, Sorted By Phase
 8: Northwest Boulevard & Zollinger Road

09/22/2020

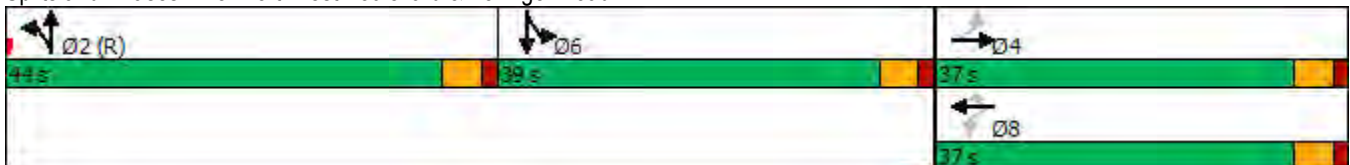


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	44	37	39	37
Maximum Split (%)	36.7%	30.8%	32.5%	30.8%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	83	44	83
End Time (s)	44	0	83	0
Yield/Force Off (s)	39	115	78	115
Yield/Force Off 170(s)	28	104	67	104
Local Start Time (s)	0	83	44	83
Local Yield (s)	39	115	78	115
Local Yield 170(s)	28	104	67	104

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
 8: Northwest Boulevard & Zollinger Road

09/22/2020

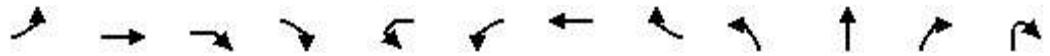


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	56	162	93	16	128	88	85	302	53	76	286	63
Future Volume (veh/h)	56	162	93	16	128	88	85	302	53	76	286	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	176	101	17	139	96	92	328	58	83	311	68
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	96	269	172	52	324	303	268	999	184	176	689	157
Arrive On Green	0.38	0.38	0.38	0.19	0.19	0.19	0.40	0.40	0.40	0.09	0.09	0.09
Sat Flow, veh/h	289	1403	896	100	1694	1585	669	2496	460	623	2432	555
Grp Volume(v), veh/h	164	0	174	156	0	96	253	0	225	245	0	217
Grp Sat Flow(s),veh/h/ln	1048	0	1541	1794	0	1585	1837	0	1788	1839	0	1770
Q Serve(g_s), s	8.2	0.0	10.8	0.0	0.0	6.3	11.5	0.0	10.4	15.2	0.0	13.9
Cycle Q Clear(g_c), s	19.3	0.0	10.8	10.9	0.0	6.3	11.5	0.0	10.4	15.2	0.0	13.9
Prop In Lane	0.37		0.58	0.11		1.00	0.36		0.26	0.34		0.31
Lane Grp Cap(c), veh/h	242	0	295	377	0	303	735	0	716	521	0	502
V/C Ratio(X)	0.68	0.00	0.59	0.41	0.00	0.32	0.34	0.00	0.31	0.47	0.00	0.43
Avail Cap(c_a), veh/h	356	0	411	507	0	423	735	0	716	521	0	502
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	0.97	0.00	0.97	1.00	0.00	1.00	1.00	0.00	1.00	0.99	0.00	0.99
Uniform Delay (d), s/veh	36.9	0.0	33.3	42.8	0.0	41.8	25.0	0.0	24.7	45.9	0.0	45.3
Incr Delay (d2), s/veh	3.2	0.0	1.8	0.7	0.0	0.6	1.3	0.0	1.2	3.0	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	3.6	4.1	0.0	2.5	5.2	0.0	4.6	7.9	0.0	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.1	0.0	35.1	43.5	0.0	42.4	26.3	0.0	25.8	48.9	0.0	48.0
LnGrp LOS	D	A	D	D	A	D	C	A	C	D	A	D
Approach Vol, veh/h		338			252			478				462
Approach Delay, s/veh		37.5			43.1			26.1				48.4
Approach LOS		D			D			C				D
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		53.2		27.8		39.0		27.8				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		39.0		32.0		34.0		32.0				
Max Q Clear Time (g_c+I1), s		13.5		21.3		17.2		12.9				
Green Ext Time (p_c), s		2.9		1.4		2.4		1.1				
Intersection Summary												
HCM 6th Ctrl Delay				38.2								
HCM 6th LOS				D								

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	160	729	135	61	27	87	253	10	102	167	159	27
Future Volume (vph)	160	729	135	61	27	87	253	10	102	167	159	27
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		365			175		0	140		200	
Storage Lanes	1		2			1		0	1		2	
Taper Length (ft)	25					25			25			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850	0.850			0.994				0.850	0.850
Flt Protected	0.950					0.950			0.950			
Satd. Flow (prot)	1770	3539	1583	1583	0	1770	3518	0	1770	1863	1583	1583
Flt Permitted	0.498					0.118			0.504			
Satd. Flow (perm)	928	3539	1583	1583	0	220	3518	0	939	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												199
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			449		
Travel Time (s)		22.6					18.2			12.2		
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
Adj. Flow (vph)	174	792	147	66	29	95	275	11	111	182	173	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	174	792	147	66	0	124	286	0	111	182	173	29
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA	Perm	Free	Perm	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2				1	6		7	4		
Permitted Phases	2		2	Free	6	6			4		4	Free
Minimum Split (s)	10.5	36.0	36.0		30.0	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	14.0	41.1	41.1		40.0	12.9	40.0		10.5	33.6	33.6	
Total Split (%)	10.0%	29.4%	29.4%		28.6%	9.2%	28.6%		7.5%	24.0%	24.0%	
Maximum Green (s)	8.5	35.1	35.1		34.0	7.4	34.0		5.0	27.6	27.6	
Yellow Time (s)	3.5	4.0	4.0		4.0	3.5	4.0		3.5	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	
Lost Time Adjust (s)	0.0	0.0	0.0			0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.5	6.0	6.0			5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag	Lag		Lag	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0	10.0		10.0		10.0			10.0	10.0	
Flash Dont Walk (s)		20.0	20.0		14.0		14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0	0		0		0			0	0	
Act Effct Green (s)	44.1	35.1	35.1	140.0		41.9	34.0		33.1	27.6	27.6	140.0
Actuated g/C Ratio	0.32	0.25	0.25	1.00		0.30	0.24		0.24	0.20	0.20	1.00
v/c Ratio	0.51	0.89	0.37	0.04		0.84	0.33		0.44	0.50	0.55	0.02

HY AM No Build with Improvements

Synchro 10 Report

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020

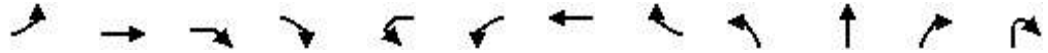


Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	76	151	218	104	1	149	66	78
Future Volume (vph)	76	151	218	104	1	149	66	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.408				0.954		
Satd. Flow (perm)	0	760	1863	1583	0	3447	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				109				199
Link Speed (mph)			35			35		
Link Distance (ft)			1258			343		
Travel Time (s)			24.5			6.7		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	164	237	113	1	162	72	85
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	247	237	113	0	163	72	85
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	15.9	15.9	39.0	14.0	36.5	36.5	36.5	
Total Split (%)	11.4%	11.4%	27.9%	10.0%	26.1%	26.1%	26.1%	
Maximum Green (s)	10.4	10.4	33.0	8.5	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		43.9	33.0	42.0		31.0	31.0	140.0
Actuated g/C Ratio		0.31	0.24	0.30		0.22	0.22	1.00
v/c Ratio		0.79	0.54	0.21		0.21	0.21	0.05

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020

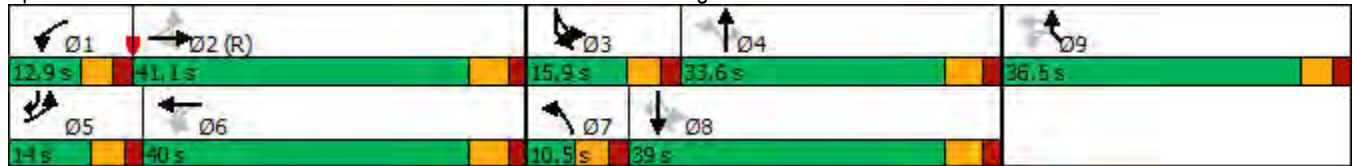


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Control Delay	40.4	64.1	46.6	0.0		77.5	45.0		44.9	55.4	58.4	0.0
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	40.4	64.1	46.6	0.0		77.5	45.0		44.9	55.4	58.4	0.0
LOS	D	E	D	A		E	D		D	E	E	A
Approach Delay		54.8				54.8			50.8			
Approach LOS		D				D			D			

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	135
Control Type:	Pretimed
Maximum v/c Ratio:	0.89
Intersection Signal Delay:	50.2
Intersection LOS:	D
Intersection Capacity Utilization	78.5%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		59.1	52.2	4.4		45.4	46.4	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		59.1	52.2	4.4		45.4	46.4	0.1
LOS		E	D	A		D	D	A
Approach Delay		46.0				33.6		
Approach LOS		D				C		
Intersection Summary								

Timing Report, Sorted By Phase

8: Northwest Boulevard & Zollinger Road

09/22/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	37	33	30	33
Maximum Split (%)	37.0%	33.0%	30.0%	33.0%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	67	37	67
End Time (s)	37	0	67	0
Yield/Force Off (s)	32	95	62	95
Yield/Force Off 170(s)	21	84	51	84
Local Start Time (s)	0	67	37	67
Local Yield (s)	32	95	62	95
Local Yield 170(s)	21	84	51	84

Intersection Summary

Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
 8: Northwest Boulevard & Zollinger Road

09/22/2020

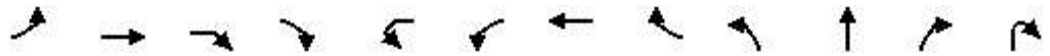


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	33	110	78	25	81	19	88	186	36	21	163	34
Future Volume (veh/h)	33	110	78	25	81	19	88	186	36	21	163	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	36	120	85	27	88	21	96	202	39	23	177	37
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	207	152	70	177	229	449	997	199	85	673	146
Arrive On Green	0.05	0.05	0.05	0.14	0.14	0.14	0.46	0.46	0.46	0.08	0.08	0.08
Sat Flow, veh/h	196	1428	1050	174	1222	1585	986	2189	437	340	2693	585
Grp Volume(v), veh/h	118	0	123	115	0	21	177	0	160	125	0	112
Grp Sat Flow(s),veh/h/ln	1161	0	1513	1397	0	1585	1821	0	1792	1853	0	1765
Q Serve(g_s), s	2.6	0.0	7.9	0.8	0.0	1.1	5.9	0.0	5.3	6.3	0.0	5.9
Cycle Q Clear(g_c), s	11.4	0.0	7.9	8.8	0.0	1.1	5.9	0.0	5.3	6.3	0.0	5.9
Prop In Lane	0.30		0.69	0.23		1.00	0.54		0.24	0.18		0.33
Lane Grp Cap(c), veh/h	215	0	219	246	0	229	829	0	816	463	0	441
V/C Ratio(X)	0.55	0.00	0.56	0.47	0.00	0.09	0.21	0.00	0.20	0.27	0.00	0.25
Avail Cap(c_a), veh/h	437	0	424	469	0	444	829	0	816	463	0	441
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	0.94	0.00	0.94	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.4	0.0	44.5	39.3	0.0	37.1	16.4	0.0	16.3	37.3	0.0	37.1
Incr Delay (d2), s/veh	2.1	0.0	2.1	1.4	0.0	0.2	0.6	0.0	0.5	1.4	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	3.2	2.6	0.0	0.5	2.5	0.0	2.2	3.1	0.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.5	0.0	46.6	40.7	0.0	37.2	17.0	0.0	16.8	38.8	0.0	38.5
LnGrp LOS	D	A	D	D	A	D	B	A	B	D	A	D
Approach Vol, veh/h		241			136			337				237
Approach Delay, s/veh		47.0			40.1			16.9				38.6
Approach LOS		D			D			B				D
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		50.5		19.5		30.0		19.5				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		32.0		28.0		25.0		28.0				
Max Q Clear Time (g_c+I1), s		7.9		13.4		8.3		10.8				
Green Ext Time (p_c), s		1.9		1.1		1.1		0.5				
Intersection Summary												
HCM 6th Ctrl Delay				33.3								
HCM 6th LOS				C								

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	160	729	153	70	34	101	253	10	110	187	159	38
Future Volume (vph)	160	729	153	70	34	101	253	10	110	187	159	38
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		490				175	0	140		200	
Storage Lanes	1		1				1	0	1		1	
Taper Length (ft)	25						25		25			
Lane Util. Factor	1.00	0.91	1.00	0.91	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850				0.994				0.850	0.850
Flt Protected	0.950					0.950			0.950			
Satd. Flow (prot)	1770	5085	1583	0	0	1770	3518	0	1770	1863	1583	1583
Flt Permitted	0.460					0.185			0.484			
Satd. Flow (perm)	857	5085	1583	0	0	345	3518	0	902	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												242
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			435		
Travel Time (s)		22.6					18.2			11.9		
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
Adj. Flow (vph)	174	792	166	76	37	110	275	11	120	203	173	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	174	792	242	0	0	147	286	0	120	203	173	41
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA	Perm		Perm	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2				1	6		7	4		
Permitted Phases	2		2		6	6			4		4	Free
Minimum Split (s)	10.5	36.0	36.0		30.0	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	17.0	36.5	36.5		34.5	15.0	34.5		11.9	33.0	33.0	
Total Split (%)	12.1%	26.1%	26.1%		24.6%	10.7%	24.6%		8.5%	23.6%	23.6%	
Maximum Green (s)	11.5	30.5	30.5		28.5	9.5	28.5		6.4	27.0	27.0	
Yellow Time (s)	3.5	4.0	4.0		4.0	3.5	4.0		3.5	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	
Lost Time Adjust (s)	0.0	0.0	0.0			0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.5	6.0	6.0			5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag	Lag		Lag	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0	10.0		10.0		10.0			10.0	10.0	
Flash Dont Walk (s)		20.0	20.0		14.0		14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0	0		0		0			0	0	
Act Effct Green (s)	42.5	30.5	30.5			38.5	28.5		33.9	27.0	27.0	140.0
Actuated g/C Ratio	0.30	0.22	0.22			0.28	0.20		0.24	0.19	0.19	1.00
v/c Ratio	0.52	0.72	0.70			0.77	0.40		0.47	0.57	0.57	0.03

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	76	167	243	104	1	163	79	84
Future Volume (vph)	76	167	243	104	1	163	79	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.362				0.954		
Satd. Flow (perm)	0	674	1863	1583	0	3447	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				109				242
Link Speed (mph)			35			35		
Link Distance (ft)			1258			350		
Travel Time (s)			24.5			6.8		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	182	264	113	1	177	86	91
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	265	264	113	0	178	86	91
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	19.0	19.0	40.1	17.0	36.5	36.5	36.5	
Total Split (%)	13.6%	13.6%	28.6%	12.1%	26.1%	26.1%	26.1%	
Maximum Green (s)	13.5	13.5	34.1	11.5	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		46.5	34.1	46.1		31.0	31.0	140.0
Actuated g/C Ratio		0.33	0.24	0.33		0.22	0.22	1.00
v/c Ratio		0.81	0.58	0.19		0.23	0.25	0.06

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020

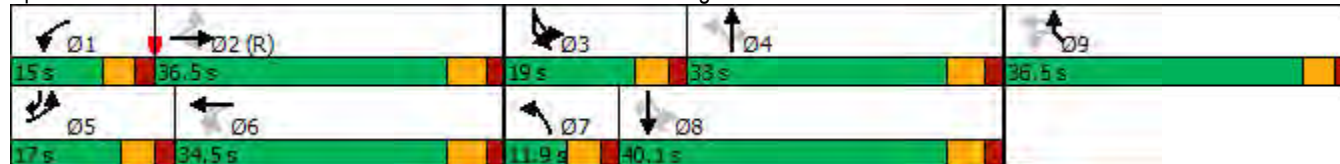


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Control Delay	41.8	54.9	62.8			62.5	50.3		43.1	58.2	59.4	0.0
Queue Delay	0.0	0.0	0.0			0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	41.8	54.9	62.8			62.5	50.3		43.1	58.2	59.4	0.0
LOS	D	D	E			E	D		D	E	E	A
Approach Delay		54.6					54.4			50.8		
Approach LOS		D					D			D		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	135
Control Type:	Pretimed
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	50.0
Intersection LOS:	D
Intersection Capacity Utilization	74.5%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		57.6	52.7	3.9		45.7	47.1	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		57.6	52.7	3.9		45.7	47.1	0.1
LOS		E	D	A		D	D	A
Approach Delay			46.2			34.4		
Approach LOS			D			C		
Intersection Summary								

Timing Report, Sorted By Phase

8: Northwest Boulevard & Zollinger Road

09/22/2020



Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	38	31	31	31
Maximum Split (%)	38.0%	31.0%	31.0%	31.0%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	69	38	69
End Time (s)	38	0	69	0
Yield/Force Off (s)	33	95	64	95
Yield/Force Off 170(s)	22	84	53	84
Local Start Time (s)	0	69	38	69
Local Yield (s)	33	95	64	95
Local Yield 170(s)	22	84	53	84

Intersection Summary

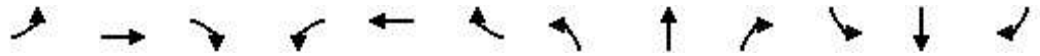
Cycle Length	100
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
8: Northwest Boulevard & Zollinger Road

09/22/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	33	110	78	25	81	38	88	225	36	36	194	34
Future Volume (veh/h)	33	110	78	25	81	38	88	225	36	36	194	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	36	120	85	27	88	41	96	245	39	39	211	37
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	205	151	69	176	229	391	1052	174	124	693	127
Arrive On Green	0.05	0.05	0.05	0.14	0.14	0.14	0.45	0.45	0.45	0.09	0.09	0.09
Sat Flow, veh/h	193	1423	1048	174	1219	1585	877	2360	390	475	2667	487
Grp Volume(v), veh/h	118	0	123	115	0	41	200	0	180	152	0	135
Grp Sat Flow(s),veh/h/ln	1150	0	1513	1392	0	1585	1826	0	1800	1847	0	1783
Q Serve(g_s), s	2.6	0.0	7.9	0.9	0.0	2.3	6.8	0.0	6.2	7.7	0.0	7.1
Cycle Q Clear(g_c), s	11.4	0.0	7.9	8.8	0.0	2.3	6.8	0.0	6.2	7.7	0.0	7.1
Prop In Lane	0.30		0.69	0.23		1.00	0.48		0.22	0.26		0.27
Lane Grp Cap(c), veh/h	213	0	218	245	0	229	814	0	802	480	0	464
V/C Ratio(X)	0.56	0.00	0.56	0.47	0.00	0.18	0.25	0.00	0.22	0.32	0.00	0.29
Avail Cap(c_a), veh/h	402	0	393	435	0	412	814	0	802	480	0	464
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	0.96	0.00	0.96	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.4	0.0	44.5	39.3	0.0	37.6	17.3	0.0	17.1	37.4	0.0	37.1
Incr Delay (d2), s/veh	2.2	0.0	2.2	1.4	0.0	0.4	0.7	0.0	0.6	1.7	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	3.2	2.6	0.0	0.9	2.9	0.0	2.6	3.9	0.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.6	0.0	46.7	40.7	0.0	38.0	18.0	0.0	17.7	39.1	0.0	38.7
LnGrp LOS	D	A	D	D	A	D	B	A	B	D	A	D
Approach Vol, veh/h		241			156			380				287
Approach Delay, s/veh		47.1			40.0			17.9				38.9
Approach LOS		D			D			B				D
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.6		19.4		31.0		19.4				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		33.0		26.0		26.0		26.0				
Max Q Clear Time (g_c+I1), s		8.8		13.4		9.7		10.8				
Green Ext Time (p_c), s		2.2		1.0		1.4		0.6				
Intersection Summary												
HCM 6th Ctrl Delay				33.4								
HCM 6th LOS				C								

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	102	248	152	71	71	144	569	10	171	224	74	19
Future Volume (vph)	102	248	152	71	71	144	569	10	171	224	74	19
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		365			175		0	140		200	
Storage Lanes	1		2			1		0	1		2	
Taper Length (ft)	25					25			25			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850	0.850			0.997				0.850	0.850
Flt Protected	0.950					0.950			0.950			
Satd. Flow (prot)	1770	3539	1583	1583	0	1770	3529	0	1770	1863	1583	1583
Flt Permitted	0.210					0.470			0.496			
Satd. Flow (perm)	391	3539	1583	1583	0	875	3529	0	924	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												199
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			439		
Travel Time (s)		22.6					18.2			12.0		
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
Adj. Flow (vph)	111	270	165	77	77	157	618	11	186	243	80	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	111	270	165	77	0	234	629	0	186	243	80	21
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA	Perm	Free	Perm	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2				1	6		7	4		
Permitted Phases	2		2	Free	6	6			4		4	Free
Minimum Split (s)	10.5	36.0	36.0		30.0	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	12.0	36.2	36.2		39.4	15.2	39.4		13.1	34.3	34.3	
Total Split (%)	8.6%	25.9%	25.9%		28.1%	10.9%	28.1%		9.4%	24.5%	24.5%	
Maximum Green (s)	6.5	30.2	30.2		33.4	9.7	33.4		7.6	28.3	28.3	
Yellow Time (s)	3.5	4.0	4.0		4.0	3.5	4.0		3.5	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	
Lost Time Adjust (s)	0.0	0.0	0.0			0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.5	6.0	6.0			5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag	Lag		Lag	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0	10.0		10.0		10.0			10.0	10.0	
Flash Dont Walk (s)		20.0	20.0		14.0		14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0	0		0		0			0	0	
Act Effct Green (s)	37.2	30.2	30.2	140.0		43.6	33.4		36.4	28.3	28.3	140.0
Actuated g/C Ratio	0.27	0.22	0.22	1.00		0.31	0.24		0.26	0.20	0.20	1.00
v/c Ratio	0.66	0.35	0.48	0.05		0.70	0.75		0.65	0.65	0.25	0.01

HY PM No Build with Improvements

Synchro 10 Report

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	22	116	216	151	6	251	85	124
Future Volume (vph)	22	116	216	151	6	251	85	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.311				0.948		
Satd. Flow (perm)	0	579	1863	1583	0	3426	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				139				199
Link Speed (mph)			35			35		
Link Distance (ft)			1258			357		
Travel Time (s)			24.5			7.0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	126	235	164	7	273	92	135
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	150	235	164	0	280	92	135
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	17.8	17.8	39.0	12.0	36.5	36.5	36.5	
Total Split (%)	12.7%	12.7%	27.9%	8.6%	26.1%	26.1%	26.1%	
Maximum Green (s)	12.3	12.3	33.0	6.5	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		45.8	33.0	40.0		31.0	31.0	140.0
Actuated g/C Ratio		0.33	0.24	0.29		0.22	0.22	1.00
v/c Ratio		0.51	0.54	0.30		0.37	0.26	0.09

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020

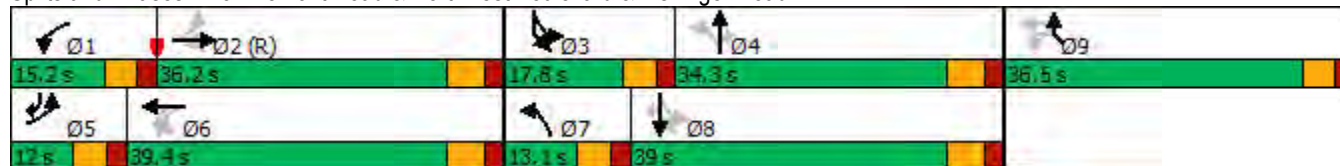


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	
Control Delay	56.3	48.2	53.6	0.1		51.0	55.8		50.9	60.3	49.4	0.0	
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	56.3	48.2	53.6	0.1		51.0	55.8		50.9	60.3	49.4	0.0	
LOS	E	D	D	A		D	E		D	E	D	A	
Approach Delay		45.1					54.5				53.0		
Approach LOS		D					D				D		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	135
Control Type:	Pretimed
Maximum v/c Ratio:	0.75
Intersection Signal Delay:	45.7
Intersection LOS:	D
Intersection Capacity Utilization	73.6%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		40.8	52.1	5.9		47.9	47.5	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		40.8	52.1	5.9		47.9	47.5	0.1
LOS		D	D	A		D	D	A
Approach Delay			35.2			35.1		
Approach LOS			D			D		
Intersection Summary								

Timing Report, Sorted By Phase

8: Northwest Boulevard & Zollinger Road

09/22/2020

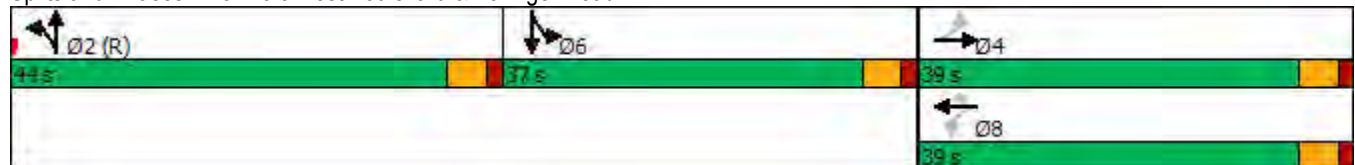


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	44	39	37	39
Maximum Split (%)	36.7%	32.5%	30.8%	32.5%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	81	44	81
End Time (s)	44	0	81	0
Yield/Force Off (s)	39	115	76	115
Yield/Force Off 170(s)	28	104	65	104
Local Start Time (s)	0	81	44	81
Local Yield (s)	39	115	76	115
Local Yield 170(s)	28	104	65	104

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
 8: Northwest Boulevard & Zollinger Road

09/22/2020

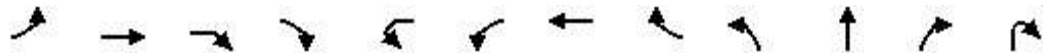


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	58	170	98	17	135	71	89	273	55	59	258	66
Future Volume (veh/h)	58	170	98	17	135	71	89	273	55	59	258	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	63	185	107	18	147	77	97	297	60	64	280	72
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	288	189	53	342	333	295	945	199	142	644	173
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.40	0.40	0.40	0.09	0.09	0.09
Sat Flow, veh/h	275	1370	900	93	1629	1585	741	2374	499	533	2416	649
Grp Volume(v), veh/h	172	0	183	165	0	77	240	0	214	221	0	195
Grp Sat Flow(s),veh/h/ln	1005	0	1540	1722	0	1585	1833	0	1780	1844	0	1754
Q Serve(g_s), s	8.9	0.0	12.8	0.1	0.0	4.8	10.9	0.0	9.9	13.7	0.0	12.6
Cycle Q Clear(g_c), s	21.7	0.0	12.8	12.9	0.0	4.8	10.9	0.0	9.9	13.7	0.0	12.6
Prop In Lane	0.37		0.58	0.11		1.00	0.40		0.28	0.29		0.37
Lane Grp Cap(c), veh/h	252	0	324	395	0	333	730	0	709	492	0	468
V/C Ratio(X)	0.68	0.00	0.57	0.42	0.00	0.23	0.33	0.00	0.30	0.45	0.00	0.42
Avail Cap(c_a), veh/h	364	0	436	522	0	449	730	0	709	492	0	468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	0.96	0.00	0.96	1.00	0.00	1.00	1.00	0.00	1.00	0.99	0.00	0.99
Uniform Delay (d), s/veh	47.4	0.0	42.5	41.1	0.0	39.4	25.0	0.0	24.7	46.4	0.0	45.9
Incr Delay (d2), s/veh	3.1	0.0	1.5	0.7	0.0	0.4	1.2	0.0	1.1	2.9	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	5.0	4.3	0.0	1.9	4.9	0.0	4.3	7.2	0.0	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.5	0.0	44.0	41.8	0.0	39.7	26.2	0.0	25.8	49.3	0.0	48.6
LnGrp LOS	D	A	D	D	A	D	C	A	C	D	A	D
Approach Vol, veh/h		355			242			454				416
Approach Delay, s/veh		47.1			41.1			26.0				49.0
Approach LOS		D			D			C				D
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		52.8		30.2		37.0		30.2				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		39.0		34.0		32.0		34.0				
Max Q Clear Time (g_c+I1), s		12.9		23.7		15.7		14.9				
Green Ext Time (p_c), s		2.7		1.5		2.1		1.0				
Intersection Summary												
HCM 6th Ctrl Delay				40.1								
HCM 6th LOS				D								

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Lane Configurations												
Traffic Volume (vph)	102	246	171	83	78	160	567	10	183	250	74	33
Future Volume (vph)	102	246	171	83	78	160	567	10	183	250	74	33
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		490			175		0	140		200	
Storage Lanes	1		1			1		0	1		2	
Taper Length (ft)	25					25			25			
Lane Util. Factor	1.00	0.91	1.00	0.91	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850				0.997				0.850	0.850
Flt Protected	0.950					0.950			0.950			
Satd. Flow (prot)	1770	5085	1583	0	0	1770	3529	0	1770	1863	1583	1583
Flt Permitted	0.191					0.563			0.369			
Satd. Flow (perm)	356	5085	1583	0	0	1049	3529	0	687	1863	1583	1583
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												199
Link Speed (mph)		35					35			25		
Link Distance (ft)		1160					934			495		
Travel Time (s)		22.6					18.2			13.5		
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
Adj. Flow (vph)	111	267	186	90	85	174	616	11	199	272	80	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	111	267	276	0	0	259	627	0	199	272	80	36
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)		12					12			12		
Link Offset(ft)		0					0			0		
Crosswalk Width(ft)		16					16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15	15		9	15		9	9
Turn Type	pm+pt	NA	Perm		Perm	pm+pt	NA		pm+pt	NA	Perm	Free
Protected Phases	5	2				1	6		7	4		
Permitted Phases	2		2		6	6			4		4	Free
Minimum Split (s)	10.5	36.0	36.0		30.0	10.5	30.0		10.5	33.0	33.0	
Total Split (s)	14.2	38.0	38.0		38.8	15.0	38.8		11.5	39.5	39.5	
Total Split (%)	10.1%	27.1%	27.1%		27.7%	10.7%	27.7%		8.2%	28.2%	28.2%	
Maximum Green (s)	8.7	32.0	32.0		32.8	9.5	32.8		6.0	33.5	33.5	
Yellow Time (s)	3.5	4.0	4.0		4.0	3.5	4.0		3.5	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	
Lost Time Adjust (s)	0.0	0.0	0.0			0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.5	6.0	6.0			5.5	6.0		5.5	6.0	6.0	
Lead/Lag	Lead	Lag	Lag		Lag	Lead	Lag		Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes	
Walk Time (s)		10.0	10.0		10.0		10.0			10.0	10.0	
Flash Dont Walk (s)		20.0	20.0		14.0		14.0			17.0	17.0	
Pedestrian Calls (#/hr)		0	0		0		0			0	0	
Act Effct Green (s)	41.2	32.0	32.0			42.8	32.8		40.0	33.5	33.5	140.0
Actuated g/C Ratio	0.29	0.23	0.23			0.31	0.23		0.29	0.24	0.24	1.00
v/c Ratio	0.58	0.23	0.76			0.70	0.76		0.82	0.61	0.21	0.02

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations								
Traffic Volume (vph)	22	133	242	151	6	270	102	133
Future Volume (vph)	22	133	242	151	6	270	102	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		120		0	150	
Storage Lanes		1		1		2	2	
Taper Length (ft)		25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.97	1.00	1.00
Frt				0.850			0.850	0.850
Flt Protected		0.950				0.950		
Satd. Flow (prot)	0	1770	1863	1583	0	3433	1583	1583
Flt Permitted		0.369				0.946		
Satd. Flow (perm)	0	687	1863	1583	0	3419	1583	1583
Right Turn on Red				Yes				Yes
Satd. Flow (RTOR)				115				199
Link Speed (mph)			35			35		
Link Distance (ft)			1258			352		
Travel Time (s)			24.5			6.9		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	145	263	164	7	293	111	145
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	169	263	164	0	300	111	145
Enter Blocked Intersection	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Left	Right	Right
Median Width(ft)			12			24		
Link Offset(ft)			0			0		
Crosswalk Width(ft)			16			16		
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15		9	15	15	9	9
Turn Type	pm+pt	pm+pt	NA	pm+ov	Perm	Perm	Prot	Free
Protected Phases	3	3	8	5			9	
Permitted Phases	8	8		8	9	9		Free
Minimum Split (s)	10.5	10.5	39.0	10.5	36.5	36.5	36.5	
Total Split (s)	11.0	11.0	39.0	14.2	36.5	36.5	36.5	
Total Split (%)	7.9%	7.9%	27.9%	10.1%	26.1%	26.1%	26.1%	
Maximum Green (s)	5.5	5.5	33.0	8.7	31.0	31.0	31.0	
Yellow Time (s)	3.5	3.5	4.0	3.5	3.5	3.5	3.5	
All-Red Time (s)	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	
Total Lost Time (s)		5.5	6.0	5.5		5.5	5.5	
Lead/Lag	Lead	Lead	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Walk Time (s)			10.0		11.0	11.0	11.0	
Flash Dont Walk (s)			23.0		16.0	16.0	16.0	
Pedestrian Calls (#/hr)			0		0	0	0	
Act Effct Green (s)		39.0	33.0	42.2		31.0	31.0	140.0
Actuated g/C Ratio		0.28	0.24	0.30		0.22	0.22	1.00
v/c Ratio		0.73	0.60	0.29		0.40	0.32	0.09

Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020

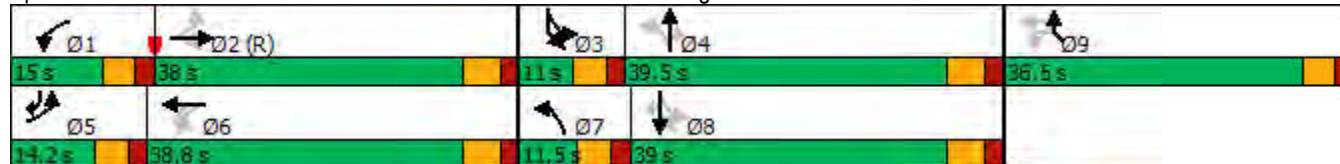


Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2
Control Delay	46.0	44.6	65.5			50.3	56.8		68.6	54.2	44.5	0.0
Queue Delay	0.0	0.0	0.0			0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	46.0	44.6	65.5			50.3	56.8		68.6	54.2	44.5	0.0
LOS	D	D	E			D	E		E	D	D	A
Approach Delay		53.6					54.9			54.5		
Approach LOS		D					D			D		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle:	135
Control Type:	Pretimed
Maximum v/c Ratio:	0.82
Intersection Signal Delay:	49.1
Intersection LOS:	D
Intersection Capacity Utilization	76.1%
ICU Level of Service	D
Analysis Period (min)	15

Splits and Phases: 3: Tremont Road & Northwest Boulevard & Fishinger Road



Lanes, Volumes, Timings

3: Tremont Road & Northwest Boulevard & Fishinger Road

09/22/2020



Lane Group	SBL2	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Control Delay		59.4	54.2	7.7		48.4	48.6	0.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		59.4	54.2	7.7		48.4	48.6	0.1
LOS		E	D	A		D	D	A
Approach Delay			42.9			35.8		
Approach LOS			D			D		
Intersection Summary								

Timing Report, Sorted By Phase

8: Northwest Boulevard & Zollinger Road

09/22/2020

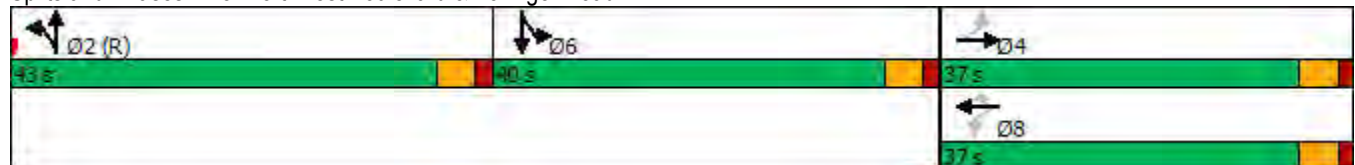


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	43	37	40	37
Maximum Split (%)	35.8%	30.8%	33.3%	30.8%
Minimum Split (s)	23	23	23	23
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5
Minimum Initial (s)	8	8	8	8
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	11	11	11	11
Dual Entry	No	No	No	No
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	83	43	83
End Time (s)	43	0	83	0
Yield/Force Off (s)	38	115	78	115
Yield/Force Off 170(s)	27	104	67	104
Local Start Time (s)	0	83	43	83
Local Yield (s)	38	115	78	115
Local Yield 170(s)	27	104	67	104

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	

Splits and Phases: 8: Northwest Boulevard & Zollinger Road



HCM 6th Signalized Intersection Summary
 8: Northwest Boulevard & Zollinger Road

09/22/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	
Traffic Volume (veh/h)	58	170	98	17	135	91	89	314	55	78	299	66
Future Volume (veh/h)	58	170	98	17	135	91	89	314	55	78	299	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	63	185	107	18	147	99	97	341	60	85	325	72
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	97	275	179	53	329	313	261	961	176	178	710	164
Arrive On Green	0.40	0.40	0.40	0.20	0.20	0.20	0.39	0.39	0.39	0.10	0.10	0.10
Sat Flow, veh/h	286	1393	904	99	1666	1585	677	2491	457	611	2434	563
Grp Volume(v), veh/h	173	0	182	165	0	99	263	0	235	256	0	226
Grp Sat Flow(s),veh/h/ln	1044	0	1539	1765	0	1585	1837	0	1788	1840	0	1769
Q Serve(g_s), s	8.9	0.0	11.2	0.0	0.0	6.4	12.3	0.0	11.1	15.8	0.0	14.5
Cycle Q Clear(g_c), s	20.3	0.0	11.2	11.3	0.0	6.4	12.3	0.0	11.1	15.8	0.0	14.5
Prop In Lane	0.36		0.59	0.11		1.00	0.37		0.26	0.33		0.32
Lane Grp Cap(c), veh/h	247	0	304	382	0	313	708	0	690	537	0	516
V/C Ratio(X)	0.70	0.00	0.60	0.43	0.00	0.32	0.37	0.00	0.34	0.48	0.00	0.44
Avail Cap(c_a), veh/h	352	0	410	502	0	423	708	0	690	537	0	516
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	0.97	0.00	0.97	1.00	0.00	1.00	1.00	0.00	1.00	0.99	0.00	0.99
Uniform Delay (d), s/veh	36.4	0.0	32.5	42.4	0.0	41.2	26.4	0.0	26.1	45.6	0.0	44.9
Incr Delay (d2), s/veh	3.5	0.0	1.8	0.8	0.0	0.6	1.5	0.0	1.3	3.0	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	3.7	4.4	0.0	2.5	5.6	0.0	5.0	8.2	0.0	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.9	0.0	34.3	43.1	0.0	41.8	27.9	0.0	27.4	48.5	0.0	47.6
LnGrp LOS	D	A	C	D	A	D	C	A	C	D	A	D
Approach Vol, veh/h		355			264			498				482
Approach Delay, s/veh		37.0			42.6			27.7				48.1
Approach LOS		D			D			C				D
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		51.3		28.7		40.0		28.7				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		38.0		32.0		35.0		32.0				
Max Q Clear Time (g_c+I1), s		14.3		22.3		17.8		13.3				
Green Ext Time (p_c), s		2.9		1.4		2.6		1.1				
Intersection Summary												
HCM 6th Ctrl Delay				38.4								
HCM 6th LOS				D								

Appendix F

Queuing Analysis

Baseline Queuing Analysis

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	B21	SB	SB
Directions Served	L	T	TR>	<L	T	TR	L	T	R	T	<L	T
Maximum Queue (ft)	200	987	945	200	553	506	162	331	224	73	145	1045
Average Queue (ft)	157	743	723	160	281	237	54	132	145	5	135	572
95th Queue (ft)	257	1188	1172	247	658	611	145	288	236	40	168	1187
Link Distance (ft)		1116	1116		847	847		268		472		1210
Upstream Blk Time (%)		12	11		0			3				6
Queuing Penalty (veh)		0	0		0			10				0
Storage Bay Dist (ft)	175			175			140		200		120	
Storage Blk Time (%)	3	65		54	2		2	4	6		54	20
Queuing Penalty (veh)	10	100		65	2		6	11	15		166	62

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	SB	NW	NW	NW
Directions Served	R	<L	L	R
Maximum Queue (ft)	145	85	76	73
Average Queue (ft)	59	30	24	16
95th Queue (ft)	152	70	64	55
Link Distance (ft)		186	186	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	120			150
Storage Blk Time (%)	0			
Queuing Penalty (veh)	0			

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	89	156	124	66	151	26	122	53	160
Average Queue (ft)	46	60	51	9	62	3	34	7	32
95th Queue (ft)	94	123	102	38	124	15	89	31	103
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	8	7			1		2		1
Queuing Penalty (veh)	7	7			0		0		0

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	111	151	161	36	160	142	120	121
Average Queue (ft)	47	59	69	10	76	48	55	62
95th Queue (ft)	93	123	129	31	134	103	101	114
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	54	30
Average Queue (ft)	19	2
95th Queue (ft)	43	15
Link Distance (ft)	982	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		190
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	62	64	55	23	166	63	126
Average Queue (ft)	22	19	20	2	46	15	24
95th Queue (ft)	54	49	54	12	119	43	87
Link Distance (ft)	502	360			853		436
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		6	3		1		0
Queuing Penalty (veh)		2	1		0		0

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	SB	B20
Directions Served	LR	LT	T
Maximum Queue (ft)	65	30	72
Average Queue (ft)	30	2	14
95th Queue (ft)	55	16	55
Link Distance (ft)	686	327	186
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	75	31	82	96	40	53
Average Queue (ft)	29	5	24	20	6	13
95th Queue (ft)	62	22	62	64	27	44
Link Distance (ft)		328	1005	1005	450	450
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Network Summary

Network wide Queuing Penalty: 464

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	B22	SB	SB
Directions Served	L	T	TR>	<L	T	TR	L	T	R	T	<L	T
Maximum Queue (ft)	200	1140	1125	200	866	868	164	348	225	127	145	1212
Average Queue (ft)	148	877	860	189	567	487	75	170	145	20	141	949
95th Queue (ft)	252	1347	1322	238	1034	976	175	347	251	120	157	1487
Link Distance (ft)		1116	1116		843	843		285		376		1210
Upstream Blk Time (%)		21	22		24	4		7				39
Queuing Penalty (veh)		0	0		0	0		28				0
Storage Bay Dist (ft)	175			175			140		200		120	
Storage Blk Time (%)	1	66		85	2		3	12	10		69	24
Queuing Penalty (veh)	5	102		102	2		12	34	28		230	80

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	SB	NW	NW	NW
Directions Served	R	<L	L	R
Maximum Queue (ft)	145	94	103	105
Average Queue (ft)	55	42	33	24
95th Queue (ft)	146	83	78	71
Link Distance (ft)		165	165	
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	120			150
Storage Blk Time (%)	0		0	0
Queuing Penalty (veh)	0		0	0

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	90	186	151	59	127	32	157	61	168
Average Queue (ft)	56	66	56	13	60	4	40	9	38
95th Queue (ft)	101	149	116	38	114	21	106	35	119
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)							0		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	11	9			0		3		2
Queuing Penalty (veh)	11	11			0		0		1

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	141	157	137	54	192	142	127	141
Average Queue (ft)	53	62	69	19	85	54	64	72
95th Queue (ft)	106	122	121	43	153	110	110	122
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (ft)	60	89	14	38
Average Queue (ft)	21	36	1	7
95th Queue (ft)	45	71	7	23
Link Distance (ft)	979	304		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			190	290
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	74	103	55	23	176	58	120
Average Queue (ft)	22	38	25	2	62	19	29
95th Queue (ft)	53	85	61	12	137	48	87
Link Distance (ft)	502	360			853		426
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		15	4		2		0
Queuing Penalty (veh)		4	2		0		0

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	SB	B20
Directions Served	LR	LT	T
Maximum Queue (ft)	80	29	57
Average Queue (ft)	33	3	12
95th Queue (ft)	59	17	42
Link Distance (ft)	688	360	165
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	105	54	114	105	51	72
Average Queue (ft)	47	24	42	36	11	25
95th Queue (ft)	91	48	90	89	38	60
Link Distance (ft)		328	1005	1005	458	458
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	1					
Queuing Penalty (veh)	0					

Network Summary

Network wide Queuing Penalty: 653

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	B21	B22	SB
Directions Served	L	T	TR>	<L	T	TR	L	T	R	T	T	<L
Maximum Queue (ft)	190	287	340	200	561	516	165	339	225	334	95	145
Average Queue (ft)	75	151	201	164	298	248	128	241	98	159	36	106
95th Queue (ft)	150	249	302	247	570	512	215	404	243	541	196	167
Link Distance (ft)		1116	1116		843	843		262		525	226	
Upstream Blk Time (%)								32		12	10	
Queuing Penalty (veh)								142		51	42	
Storage Bay Dist (ft)	175			175			140		200			120
Storage Blk Time (%)	0	6		38	5		41	19	0			10
Queuing Penalty (veh)	0	6		104	11		125	49	2			34

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	SB	SB	NW	NW	NW	NW
Directions Served	T	R	<L	L	R	>
Maximum Queue (ft)	463	145	154	160	150	30
Average Queue (ft)	220	80	65	71	34	1
95th Queue (ft)	405	163	118	128	95	22
Link Distance (ft)	1210		206	206		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		120			150	150
Storage Blk Time (%)	25	0		0	0	0
Queuing Penalty (veh)	68	1		1	0	0

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	90	148	145	155	299	73	181	108	232
Average Queue (ft)	48	53	58	49	145	12	72	13	80
95th Queue (ft)	97	122	120	137	253	42	160	52	179
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)							1		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	9	8		0	12	0	6		5
Queuing Penalty (veh)	7	7		0	6	0	2		2

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	182	190	210	62	193	173	190	203
Average Queue (ft)	88	87	101	26	107	85	110	109
95th Queue (ft)	155	159	176	53	179	154	172	180
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	NB	NB
Directions Served	LR	L	T
Maximum Queue (ft)	104	68	90
Average Queue (ft)	41	15	39
95th Queue (ft)	166	92	234
Link Distance (ft)	982		436
Upstream Blk Time (%)			3
Queuing Penalty (veh)			11
Storage Bay Dist (ft)		190	
Storage Blk Time (%)			7
Queuing Penalty (veh)			1

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	101	195	64	45	334	135	169
Average Queue (ft)	38	75	43	7	101	33	51
95th Queue (ft)	85	151	70	28	290	79	130
Link Distance (ft)	502	360			853		436
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		31	13		8	0	1
Queuing Penalty (veh)		26	11		1	0	1

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	NB	SB
Directions Served	LR	T	LT
Maximum Queue (ft)	64	4	35
Average Queue (ft)	32	0	5
95th Queue (ft)	54	3	25
Link Distance (ft)	686	448	334
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	133	202	153	180	70	84
Average Queue (ft)	87	30	57	69	16	32
95th Queue (ft)	138	107	114	144	51	71
Link Distance (ft)		328	1005	1005	448	448
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	10	0				
Queuing Penalty (veh)	3	0				

Network Summary

Network wide Queuing Penalty: 713

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	B22	B24	SB
Directions Served	L	T	TR>	<L	T	TR	L	T	R	T	T	<L
Maximum Queue (ft)	200	544	613	200	752	693	165	351	225	497	348	145
Average Queue (ft)	89	263	373	187	451	385	162	315	147	381	211	113
95th Queue (ft)	191	490	623	241	802	731	174	387	302	652	466	176
Link Distance (ft)		1116	1116		848	848		260		400	325	
Upstream Blk Time (%)					4	0		70		60	31	
Queuing Penalty (veh)					0	0		346		294	150	
Storage Bay Dist (ft)	175			175			140		200			120
Storage Blk Time (%)	0	15		61	7		74	30	1			17
Queuing Penalty (veh)	0	14		164	16		253	84	3			63

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	SB	SB	NW	NW	NW	NW
Directions Served	T	R	<L	L	R	>
Maximum Queue (ft)	569	145	152	192	168	23
Average Queue (ft)	279	88	64	65	31	1
95th Queue (ft)	525	177	125	134	94	17
Link Distance (ft)	1210		172	172		
Upstream Blk Time (%)			0	0	0	
Queuing Penalty (veh)			1	1	0	
Storage Bay Dist (ft)		120			150	150
Storage Blk Time (%)	30	0		1	0	
Queuing Penalty (veh)	88	1		2	0	

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	89	252	228	144	388	99	201	111	304
Average Queue (ft)	62	81	70	36	158	18	108	14	121
95th Queue (ft)	103	222	180	113	300	64	206	62	250
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)							7		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	20	7		0	13	0	17	0	12
Queuing Penalty (veh)	16	8		0	7	0	6	0	4

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	161	194	214	60	245	211	204	210
Average Queue (ft)	89	90	100	29	131	104	122	125
95th Queue (ft)	143	157	174	55	215	190	185	197
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (ft)	200	328	214	434	44
Average Queue (ft)	72	172	26	206	10
95th Queue (ft)	204	387	137	541	31
Link Distance (ft)	979	306		426	
Upstream Blk Time (%)		38		18	
Queuing Penalty (veh)		0		82	
Storage Bay Dist (ft)			190		290
Storage Blk Time (%)				38	
Queuing Penalty (veh)				6	

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	149	282	64	104	688	146	233
Average Queue (ft)	51	112	43	10	254	36	72
95th Queue (ft)	118	230	70	55	695	88	171
Link Distance (ft)	502	360			853		426
Upstream Blk Time (%)					3		
Queuing Penalty (veh)					18		
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		34	28		27	0	1
Queuing Penalty (veh)		29	31		4	1	1

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	NB	SB	B20
Directions Served	LR	TR	LT	T
Maximum Queue (ft)	74	4	43	38
Average Queue (ft)	36	0	5	6
95th Queue (ft)	62	0	25	29
Link Distance (ft)	687	460	331	172
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	134	277	194	186	85	132
Average Queue (ft)	105	84	91	87	21	42
95th Queue (ft)	150	227	164	171	60	95
Link Distance (ft)		328	1005	1005	460	460
Upstream Blk Time (%)		0				
Queuing Penalty (veh)		0				
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	17					
Queuing Penalty (veh)	16					

Network Summary

Network wide Queuing Penalty: 1707

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	B21	SB
Directions Served	L	T	TR>	<L	T	TR	L	T	R	>	T	<L
Maximum Queue (ft)	200	1142	1154	200	690	632	163	304	222	42	43	145
Average Queue (ft)	154	868	846	183	375	328	53	117	129	3	2	138
95th Queue (ft)	260	1300	1295	242	750	705	141	232	218	45	32	165
Link Distance (ft)		1116	1116		844	844		291			461	
Upstream Blk Time (%)		22	21		0			1				
Queuing Penalty (veh)		0	0		0			3				
Storage Bay Dist (ft)	175			175			140		200	200		120
Storage Blk Time (%)	4	67		76	1		3	5	4	0		59
Queuing Penalty (veh)	17	107		95	1		12	14	10	0		192

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	SB	SB	NW	NW	NW
Directions Served	T	R	<L	L	R
Maximum Queue (ft)	1082	145	96	110	96
Average Queue (ft)	696	56	44	36	24
95th Queue (ft)	1341	145	89	85	68
Link Distance (ft)	1210		181	181	
Upstream Blk Time (%)	20				
Queuing Penalty (veh)	0				
Storage Bay Dist (ft)		120			150
Storage Blk Time (%)	18	0		0	
Queuing Penalty (veh)	59	0		0	

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	89	173	142	77	133	24	123	85	136
Average Queue (ft)	49	64	58	12	61	3	35	11	29
95th Queue (ft)	93	133	110	36	111	13	94	44	91
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)							0		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	6	9			0		2		1
Queuing Penalty (veh)	6	10			0		0		0

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	130	160	178	32	171	131	118	135
Average Queue (ft)	48	62	76	11	78	52	53	61
95th Queue (ft)	99	127	141	32	138	107	94	114
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	47	31
Average Queue (ft)	18	2
95th Queue (ft)	43	15
Link Distance (ft)	982	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		190
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	62	78	55	27	146	62	99
Average Queue (ft)	21	23	26	2	47	17	18
95th Queue (ft)	50	58	61	14	118	46	65
Link Distance (ft)	502	360			853		436
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		7	4		1		0
Queuing Penalty (veh)		2	1		0		0

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	NB	SB	B20
Directions Served	LR	TR	LT	T
Maximum Queue (ft)	66	4	30	68
Average Queue (ft)	31	0	3	9
95th Queue (ft)	54	3	19	43
Link Distance (ft)	687	458	344	181
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	70	36	66	107	40	58
Average Queue (ft)	29	4	19	24	6	12
95th Queue (ft)	61	21	53	75	27	43
Link Distance (ft)		328	1005	1005	458	458
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Network Summary

Network wide Queuing Penalty: 530

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	B22	SB
Directions Served	L	T	TR>	<L	T	TR	L	T	R	>	T	<L
Maximum Queue (ft)	200	1152	1153	200	866	848	164	292	280	180	8	145
Average Queue (ft)	152	1039	1031	197	656	507	72	140	139	16	0	141
95th Queue (ft)	259	1332	1345	217	1061	1018	167	257	239	109	6	157
Link Distance (ft)		1116	1116		834	834		303	303		374	
Upstream Blk Time (%)		50	54		42	6		0	0			
Queuing Penalty (veh)		0	0		0	0		1	0			
Storage Bay Dist (ft)	175			175			140			200		120
Storage Blk Time (%)	2	71		94	1		3	13	5	0		63
Queuing Penalty (veh)	8	113		120	2		6	15	2	0		219

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	SB	SB	NW	NW	NW
Directions Served	T	R	<L	L	R
Maximum Queue (ft)	1175	145	123	123	128
Average Queue (ft)	839	54	60	59	51
95th Queue (ft)	1495	144	105	106	102
Link Distance (ft)	1210		222	222	
Upstream Blk Time (%)	30				
Queuing Penalty (veh)	0				
Storage Bay Dist (ft)		120			150
Storage Blk Time (%)	25	0		0	0
Queuing Penalty (veh)	85	0		0	0

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	89	161	132	92	178	36	165	53	195
Average Queue (ft)	56	61	60	13	69	5	47	8	38
95th Queue (ft)	97	124	111	48	139	22	116	31	118
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)							0		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	12	8			1		3		2
Queuing Penalty (veh)	11	11			0		0		1

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	111	136	163	60	173	142	136	146
Average Queue (ft)	49	61	78	20	91	55	69	77
95th Queue (ft)	90	114	139	46	156	114	114	130
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (ft)	58	87	21	10	44
Average Queue (ft)	24	35	2	0	5
95th Queue (ft)	52	70	11	7	22
Link Distance (ft)	979	293		426	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			190		290
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	78	95	62	42	185	63	144
Average Queue (ft)	27	33	24	2	65	17	29
95th Queue (ft)	62	73	61	14	148	47	93
Link Distance (ft)	502	360			853		426
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		13	4		2		0
Queuing Penalty (veh)		4	2		0		0

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	77	35
Average Queue (ft)	32	2
95th Queue (ft)	58	17
Link Distance (ft)	684	349
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	113	84	95	99	53	66
Average Queue (ft)	52	28	44	32	12	22
95th Queue (ft)	99	63	85	80	39	56
Link Distance (ft)		328	1005	1005	460	460
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	1					
Queuing Penalty (veh)	0					

Network Summary

Network wide Queuing Penalty: 601

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	B21	B23	SB
Directions Served	L	T	TR>	<L	T	TR	L	T	R	T	T	<L
Maximum Queue (ft)	200	405	447	200	535	496	165	364	225	590	250	145
Average Queue (ft)	92	203	282	170	364	315	145	279	118	249	64	113
95th Queue (ft)	186	358	458	249	751	693	211	443	272	674	238	175
Link Distance (ft)		1116	1116		839	839		276		495	255	
Upstream Blk Time (%)					7	0		45		25	5	
Queuing Penalty (veh)					0	0		204		114	24	
Storage Bay Dist (ft)	175			175			140		200			120
Storage Blk Time (%)	1	10		40	7		48	25	0			13
Queuing Penalty (veh)	2	10		114	14		150	65	0			50

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	SB	SB	NW	NW	NW	NW	B20
Directions Served	T	R	<L	L	R	>	T
Maximum Queue (ft)	510	145	153	177	155	28	7
Average Queue (ft)	257	86	74	74	41	1	0
95th Queue (ft)	474	170	134	146	109	20	6
Link Distance (ft)	1210		190	190			325
Upstream Blk Time (%)			0	0	0		
Queuing Penalty (veh)			0	1	0		
Storage Bay Dist (ft)		120			150	150	
Storage Blk Time (%)	31	1		1	0	0	
Queuing Penalty (veh)	89	3		2	0	0	

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	90	160	155	154	291	87	186	107	248
Average Queue (ft)	52	60	60	43	150	13	82	19	85
95th Queue (ft)	98	129	120	128	259	44	173	71	195
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)							2		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	11	8		0	13	0	10	0	5
Queuing Penalty (veh)	10	7		0	7	0	4	1	2

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	181	202	223	53	203	189	208	212
Average Queue (ft)	81	93	112	29	114	92	118	117
95th Queue (ft)	145	173	192	48	185	172	182	188
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (ft)	64	31	192	10
Average Queue (ft)	21	6	23	0
95th Queue (ft)	47	26	132	8
Link Distance (ft)	982		436	255
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		190		
Storage Blk Time (%)			3	
Queuing Penalty (veh)			0	

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	98	214	57	26	245	125	172
Average Queue (ft)	42	80	46	4	82	35	50
95th Queue (ft)	81	165	66	19	189	80	128
Link Distance (ft)	502	360			853		436
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		34	12		4	0	1
Queuing Penalty (veh)		29	11		1	0	1

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	SB	B20
Directions Served	LR	LT	T
Maximum Queue (ft)	70	48	22
Average Queue (ft)	32	8	1
95th Queue (ft)	56	31	12
Link Distance (ft)	686	325	190
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	134	196	159	171	79	109
Average Queue (ft)	94	46	65	70	18	34
95th Queue (ft)	147	152	125	144	55	82
Link Distance (ft)		328	1005	1005	465	465
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	12					
Queuing Penalty (veh)	4					

Network Summary

Network wide Queuing Penalty: 918

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	B22	B24	SB
Directions Served	L	T	TR>	<L	T	TR	L	T	R	T	T	<L
Maximum Queue (ft)	199	862	916	200	829	790	165	401	225	447	369	145
Average Queue (ft)	89	493	667	193	549	500	158	355	132	341	251	115
95th Queue (ft)	182	1021	1116	226	994	950	195	461	298	590	513	178
Link Distance (ft)		1116	1116		848	848		307		361	349	
Upstream Blk Time (%)		6	8		25	4		74		69	40	
Queuing Penalty (veh)		0	0		0	0		383		355	204	
Storage Bay Dist (ft)	175			175			140		200			120
Storage Blk Time (%)	0	15		70	7		72	26	0			20
Queuing Penalty (veh)	0	15		197	17		257	76	0			79

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	SB	SB	NW	NW	NW	NW
Directions Served	T	R	<L	L	R	>
Maximum Queue (ft)	749	145	149	161	144	52
Average Queue (ft)	350	93	69	69	39	2
95th Queue (ft)	720	178	131	136	122	25
Link Distance (ft)	1210		164	164		
Upstream Blk Time (%)	0		0	0	0	
Queuing Penalty (veh)	0		0	0	0	
Storage Bay Dist (ft)		120			150	150
Storage Blk Time (%)	32	1		0	0	0
Queuing Penalty (veh)	98	3		1	0	0

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	90	453	401	154	549	100	221	106	374
Average Queue (ft)	67	131	113	53	191	20	134	13	123
95th Queue (ft)	108	355	309	149	402	70	242	53	271
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)							32		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	38	6			24	0	38		11
Queuing Penalty (veh)	31	8			13	0	14		4

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	202	225	208	94	234	186	235	232
Average Queue (ft)	99	104	107	34	137	109	122	125
95th Queue (ft)	167	193	177	65	213	188	197	198
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (ft)	256	318	214	445	51
Average Queue (ft)	89	197	37	265	8
95th Queue (ft)	244	411	166	603	31
Link Distance (ft)	979	306		426	
Upstream Blk Time (%)		47		30	
Queuing Penalty (veh)		0		147	
Storage Bay Dist (ft)			190		290
Storage Blk Time (%)			0	54	
Queuing Penalty (veh)			0	9	

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	214	366	63	100	871	120	252
Average Queue (ft)	72	131	48	7	441	36	83
95th Queue (ft)	181	267	68	43	1035	83	186
Link Distance (ft)	502	360			853		426
Upstream Blk Time (%)		2			17		
Queuing Penalty (veh)		0			92		
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		32	43		47	0	2
Queuing Penalty (veh)		28	49		7	0	2

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	NB	SB	B20
Directions Served	LR	T	LT	T
Maximum Queue (ft)	79	7	40	23
Average Queue (ft)	36	0	7	1
95th Queue (ft)	63	5	29	12
Link Distance (ft)	688	461	339	164
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	134	336	217	213	88	128
Average Queue (ft)	112	113	105	97	25	40
95th Queue (ft)	154	284	182	183	67	94
Link Distance (ft)		328	1005	1005	461	461
Upstream Blk Time (%)		1				
Queuing Penalty (veh)		0				
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	24					
Queuing Penalty (veh)	23					

Network Summary

Network wide Queuing Penalty: 2111

Queuing Analysis with Improvements

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	B21	SB
Directions Served	L	T	T	R>	<L	T	TR	L	T	R	T	<L
Maximum Queue (ft)	200	409	375	242	161	158	127	163	312	224	35	145
Average Queue (ft)	147	267	238	112	72	78	41	40	124	134	2	137
95th Queue (ft)	248	391	357	204	143	142	107	122	270	230	25	165
Link Distance (ft)		1115	1115			847	847		268		472	
Upstream Blk Time (%)									2			
Queuing Penalty (veh)									7			
Storage Bay Dist (ft)	175			465	175			140		200		120
Storage Blk Time (%)	1	28			1	0		0	4	5		52
Queuing Penalty (veh)	4	44			1	0		2	12	13		160

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	SB	SB	NW	NW	NW	NW
Directions Served	T	R	<L	L	R	>
Maximum Queue (ft)	1002	145	104	103	98	40
Average Queue (ft)	557	54	28	26	14	1
95th Queue (ft)	1172	136	71	70	59	24
Link Distance (ft)	1210		186	186		
Upstream Blk Time (%)	6				0	
Queuing Penalty (veh)	0				0	
Storage Bay Dist (ft)		120			150	150
Storage Blk Time (%)	18	0		0	0	0
Queuing Penalty (veh)	57	1		0	0	0

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	87	132	110	46	143	15	123	60	174
Average Queue (ft)	42	56	52	10	62	3	29	8	31
95th Queue (ft)	84	107	99	31	122	11	83	34	97
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	5	6			0		2	0	1
Queuing Penalty (veh)	4	6			0		0	0	0

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	115	144	144	28	150	125	98	117
Average Queue (ft)	45	55	64	8	66	49	48	58
95th Queue (ft)	91	113	115	27	124	103	88	105
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	NB	SB
Directions Served	LR	L	TR
Maximum Queue (ft)	44	31	4
Average Queue (ft)	20	3	0
95th Queue (ft)	41	19	3
Link Distance (ft)	982		269
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		190	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	67	65	50	42	165	54	140
Average Queue (ft)	22	20	24	4	45	16	26
95th Queue (ft)	55	51	56	24	113	44	86
Link Distance (ft)	502	360			853		436
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		6	4		1		0
Queuing Penalty (veh)		2	1		0		0

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	SB	B20
Directions Served	LR	LT	T
Maximum Queue (ft)	61	35	57
Average Queue (ft)	30	3	10
95th Queue (ft)	54	18	43
Link Distance (ft)	686	327	186
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	68	31	61	87	35	53
Average Queue (ft)	24	5	20	20	6	10
95th Queue (ft)	57	23	55	68	27	38
Link Distance (ft)		328	1005	1005	450	450
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	110					
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 313

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	>	<	L	T	TR	L	T	R
Maximum Queue (ft)	200	470	447	243	27	104	165	192	162	164	362	225
Average Queue (ft)	131	279	248	102	2	20	68	82	44	79	198	164
95th Queue (ft)	245	434	395	211	11	82	153	180	132	181	389	267
Link Distance (ft)		1116	1116					836	836		286	
Upstream Blk Time (%)												11
Queuing Penalty (veh)												46
Storage Bay Dist (ft)	175			390	390	175	175			140		200
Storage Blk Time (%)	0	29	1	0		0	4	0		7	13	14
Queuing Penalty (veh)	1	44	2	0		0	6	0		25	39	41

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	B22	SB	SB	SB	NW	NW	NW	NW
Directions Served	T	<L	T	R	<L	L	R	>
Maximum Queue (ft)	263	145	1203	145	106	108	120	37
Average Queue (ft)	24	140	746	47	49	46	28	2
95th Queue (ft)	125	162	1277	136	95	94	79	29
Link Distance (ft)	376		1203		167	167		
Upstream Blk Time (%)	0		4				0	
Queuing Penalty (veh)	0		0				0	
Storage Bay Dist (ft)		120		120			150	150
Storage Blk Time (%)		64	21	0		0	0	0
Queuing Penalty (veh)		211	70	1		0	0	0

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	90	193	147	89	164	16	142	76	166
Average Queue (ft)	58	73	56	12	63	3	46	11	41
95th Queue (ft)	102	153	116	52	124	13	115	44	115
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)							0		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	12	9			1		3		2
Queuing Penalty (veh)	11	12			0		0		1

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	134	154	154	50	189	142	122	146
Average Queue (ft)	54	56	71	17	78	48	62	68
95th Queue (ft)	101	114	132	41	145	101	107	121
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (ft)	51	86	14	46
Average Queue (ft)	20	34	1	9
95th Queue (ft)	45	67	8	30
Link Distance (ft)	979	304		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			190	290
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	63	91	55	18	177	71	121
Average Queue (ft)	19	35	28	2	64	19	31
95th Queue (ft)	50	74	64	13	146	49	88
Link Distance (ft)	502	360			853		426
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		13	4		2		0
Queuing Penalty (veh)		4	2		0		0

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	SB	B20
Directions Served	LR	LT	T
Maximum Queue (ft)	72	39	63
Average Queue (ft)	33	3	12
95th Queue (ft)	57	20	43
Link Distance (ft)	688	360	167
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	114	56	102	122	53	91
Average Queue (ft)	53	23	46	41	11	27
95th Queue (ft)	95	50	89	96	39	69
Link Distance (ft)		328	1005	1005	458	458
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	1					
Queuing Penalty (veh)	0					

Network Summary

Network wide Queuing Penalty: 516

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	B21	SB
Directions Served	L	T	T	R>	<L	T	TR	L	T	R	T	<L
Maximum Queue (ft)	146	255	298	357	200	503	458	165	329	206	122	145
Average Queue (ft)	56	109	83	184	172	301	250	102	163	72	12	102
95th Queue (ft)	115	233	259	361	247	551	498	192	308	179	97	165
Link Distance (ft)		1115	1115			843	843		262		525	
Upstream Blk Time (%)									6			
Queuing Penalty (veh)									27			
Storage Bay Dist (ft)	175			465	175			140		200		120
Storage Blk Time (%)	0	0	1	2	39	6		11	12	0		7
Queuing Penalty (veh)	0	0	2	2	108	12		34	29	0		25

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	SB	SB	NW	NW	NW	NW
Directions Served	T	R	<L	L	R	>
Maximum Queue (ft)	405	145	135	148	96	7
Average Queue (ft)	190	86	68	70	33	0
95th Queue (ft)	360	170	118	124	82	5
Link Distance (ft)	1210		206	206		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		120			150	150
Storage Blk Time (%)	23	0		0	0	
Queuing Penalty (veh)	63	1		0	0	

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	89	160	169	154	315	100	176	92	248
Average Queue (ft)	45	51	58	42	144	14	71	14	75
95th Queue (ft)	90	114	119	123	252	49	151	50	186
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)							1		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	9	7			11	0	7		5
Queuing Penalty (veh)	7	6			6	0	2		2

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	177	184	181	59	184	175	170	185
Average Queue (ft)	91	96	95	25	98	83	96	94
95th Queue (ft)	151	166	159	51	165	153	155	167
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	38	31
Average Queue (ft)	19	4
95th Queue (ft)	39	21
Link Distance (ft)	982	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		190
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	100	152	61	62	256	82	162
Average Queue (ft)	40	63	44	6	82	30	46
95th Queue (ft)	85	128	65	33	189	65	122
Link Distance (ft)	502	360			853		436
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		28	11		4		0
Queuing Penalty (veh)		24	10		1		0

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	SB	B20
Directions Served	LR	LT	T
Maximum Queue (ft)	69	39	11
Average Queue (ft)	30	5	1
95th Queue (ft)	56	24	9
Link Distance (ft)	686	334	206
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	134	203	149	172	72	98
Average Queue (ft)	92	41	61	71	17	31
95th Queue (ft)	142	134	121	143	51	77
Link Distance (ft)		328	1005	1005	448	448
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	12					
Queuing Penalty (veh)	4					

Network Summary

Network wide Queuing Penalty: 366

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	B22
Directions Served	L	T	T	R	>	<L	T	TR	L	T	R	T
Maximum Queue (ft)	167	180	226	261	114	200	734	670	165	328	225	214
Average Queue (ft)	62	99	70	125	7	190	443	374	124	208	88	29
95th Queue (ft)	123	162	165	238	65	228	827	746	209	363	220	154
Link Distance (ft)		1115	1115				848	848		259		400
Upstream Blk Time (%)							5	0		11		1
Queuing Penalty (veh)							0	0		54		3
Storage Bay Dist (ft)	175			390	390	175			140		200	
Storage Blk Time (%)	0	0	0	0	0	63	4		16	20	0	
Queuing Penalty (veh)	0	0	0	0	0	171	10		54	56	0	

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	B24	SB	SB	SB	NW	NW	NW	NW	B20
Directions Served	T	<L	T	R	<L	L	R	>	T
Maximum Queue (ft)	31	145	627	145	142	175	136	59	11
Average Queue (ft)	1	117	287	91	70	72	31	1	0
95th Queue (ft)	23	176	550	178	127	137	96	20	8
Link Distance (ft)	325		1210		172	172			331
Upstream Blk Time (%)					0	0	0		
Queuing Penalty (veh)					0	1	0		
Storage Bay Dist (ft)		120		120			150	150	
Storage Blk Time (%)		19	34	0		1	0		
Queuing Penalty (veh)		72	98	2		2	0		

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	90	216	180	154	288	79	186	124	271
Average Queue (ft)	60	72	69	42	143	13	89	14	99
95th Queue (ft)	105	170	139	127	243	44	188	55	222
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)							3		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	16	9		0	12	0	11		8
Queuing Penalty (veh)	13	11		0	6	0	4		2

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	172	210	194	61	214	192	212	212
Average Queue (ft)	89	98	93	28	121	90	109	108
95th Queue (ft)	148	170	168	51	194	169	178	177
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (ft)	51	116	17	52
Average Queue (ft)	20	45	3	13
95th Queue (ft)	45	86	13	36
Link Distance (ft)	979	306		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			190	290
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	97	195	64	31	234	129	204
Average Queue (ft)	38	92	47	6	94	37	61
95th Queue (ft)	81	167	67	23	192	90	147
Link Distance (ft)	502	360			853		426
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		38	10		4	0	1
Queuing Penalty (veh)		32	11		1	0	1

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	SB	B20
Directions Served	LR	LT	T
Maximum Queue (ft)	68	51	58
Average Queue (ft)	34	7	12
95th Queue (ft)	62	31	41
Link Distance (ft)	687	331	172
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	134	319	192	208	92	126
Average Queue (ft)	111	94	96	90	24	42
95th Queue (ft)	150	247	169	180	64	98
Link Distance (ft)		328	1005	1005	460	460
Upstream Blk Time (%)		0				
Queuing Penalty (veh)		0				
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	17					
Queuing Penalty (veh)	16					

Network Summary

Network wide Queuing Penalty: 623

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	>	<L	T	TR	L	T	R	>
Maximum Queue (ft)	200	437	408	220	13	154	189	150	164	295	224	85
Average Queue (ft)	144	288	251	78	0	63	84	47	48	116	132	5
95th Queue (ft)	252	411	366	165	3	129	153	123	126	230	221	55
Link Distance (ft)		1115	1115				844	844		291		
Upstream Blk Time (%)										1		
Queuing Penalty (veh)										5		
Storage Bay Dist (ft)	175			365	365	175			140		200	200
Storage Blk Time (%)	2	29	0	0	0	0	0	0	1	4	4	0
Queuing Penalty (veh)	6	46	1	0	0	0	0	0	2	12	11	0

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	B21	SB	SB	SB	NW	NW	NW	NW
Directions Served	T	<L	T	R	<L	L	R	>
Maximum Queue (ft)	8	145	1170	145	89	126	115	22
Average Queue (ft)	0	141	751	47	38	36	25	1
95th Queue (ft)	6	159	1331	134	77	88	74	12
Link Distance (ft)	461		1210		181	181		
Upstream Blk Time (%)			15		0	0		
Queuing Penalty (veh)			0		0	0		
Storage Bay Dist (ft)		120		120		150	150	
Storage Blk Time (%)		65	17	0	0	0		
Queuing Penalty (veh)		211	58	1	0	0		

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	90	158	132	47	149	15	122	93	174
Average Queue (ft)	46	62	57	11	65	2	32	12	40
95th Queue (ft)	93	125	109	34	124	11	89	52	123
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)							0		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	6	8			0		2		2
Queuing Penalty (veh)	6	9			0		0		1

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	106	152	176	37	151	125	121	134
Average Queue (ft)	49	58	73	11	70	47	47	58
95th Queue (ft)	90	114	134	33	123	103	95	109
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	55	25
Average Queue (ft)	19	3
95th Queue (ft)	46	19
Link Distance (ft)	982	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		190
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	77	85	52	28	166	79	115
Average Queue (ft)	21	25	23	2	41	21	27
95th Queue (ft)	56	60	58	14	112	55	84
Link Distance (ft)	502	360			853		436
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		7	4		1		0
Queuing Penalty (veh)		2	1		0		0

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	SB	B20
Directions Served	LR	LT	T
Maximum Queue (ft)	53	35	61
Average Queue (ft)	30	4	7
95th Queue (ft)	50	22	38
Link Distance (ft)	687	344	181
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	79	30	87	94	48	65
Average Queue (ft)	29	4	22	22	9	16
95th Queue (ft)	64	20	63	70	33	50
Link Distance (ft)		328	1005	1005	458	458
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Network Summary

Network wide Queuing Penalty: 371

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	R>	<L	T	TR	L	T	R	>
Maximum Queue (ft)	200	376	362	276	306	172	147	134	164	329	247	177
Average Queue (ft)	138	249	215	145	160	69	67	39	81	152	127	13
95th Queue (ft)	243	353	319	235	275	146	126	104	175	285	220	97
Link Distance (ft)		1115	1115	1115			818	818		307	307	
Upstream Blk Time (%)										3	0	
Queuing Penalty (veh)										7	1	
Storage Bay Dist (ft)	175				490	175			140			200
Storage Blk Time (%)	1	25				0	0		4	14	3	0
Queuing Penalty (veh)	3	41				1	0		8	16	1	0

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	B22	B22	SB	SB	SB	NW	NW	NW
Directions Served	T	T	<L	T	R	<L	L	R
Maximum Queue (ft)	62	11	145	1141	145	115	143	151
Average Queue (ft)	3	0	140	711	63	63	70	61
95th Queue (ft)	38	8	161	1284	158	107	125	116
Link Distance (ft)	374	374		1210		212	212	
Upstream Blk Time (%)				9				
Queuing Penalty (veh)				0				
Storage Bay Dist (ft)			120		120			150
Storage Blk Time (%)			59	27	0		0	1
Queuing Penalty (veh)			206	93	1		0	0

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	90	178	140	85	150	24	154	106	188
Average Queue (ft)	58	62	59	13	72	3	43	15	49
95th Queue (ft)	99	136	115	48	132	15	110	55	138
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)							0		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	11	7			1		2		2
Queuing Penalty (veh)	11	9			0		0		1

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	108	158	149	58	164	149	127	128
Average Queue (ft)	50	56	64	19	83	52	61	71
95th Queue (ft)	93	115	118	43	145	106	110	122
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (ft)	64	90	16	17	37
Average Queue (ft)	21	33	1	1	6
95th Queue (ft)	49	65	8	9	21
Link Distance (ft)	979	293		426	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			190		290
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	58	110	55	23	180	89	141
Average Queue (ft)	24	40	26	3	67	21	33
95th Queue (ft)	55	84	61	14	154	58	92
Link Distance (ft)	502	360			853		426
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		15	5		3		0
Queuing Penalty (veh)		4	2		0		0

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	60	31
Average Queue (ft)	33	4
95th Queue (ft)	54	20
Link Distance (ft)	684	349
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	114	100	115	109	56	73
Average Queue (ft)	54	25	50	44	15	26
95th Queue (ft)	102	65	93	96	46	63
Link Distance (ft)		328	1005	1005	460	460
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	1					
Queuing Penalty (veh)	0					

Network Summary

Network wide Queuing Penalty: 406

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	B21
Directions Served	L	T	T	R	>	<L	T	TR	L	T	R	T
Maximum Queue (ft)	154	187	154	210	36	200	571	509	166	335	201	168
Average Queue (ft)	73	105	71	103	2	167	283	238	107	175	77	18
95th Queue (ft)	135	167	145	183	16	250	503	439	197	324	197	131
Link Distance (ft)		1115	1115				839	839		275		495
Upstream Blk Time (%)										6		
Queuing Penalty (veh)										27		
Storage Bay Dist (ft)	175			365	365	175			140		200	
Storage Blk Time (%)	0	1				32	9		10	16	0	
Queuing Penalty (veh)	0	1				91	20		33	42	0	

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	SB	SB	SB	NW	NW	NW
Directions Served	<L	T	R	<L	L	R
Maximum Queue (ft)	145	511	145	153	169	146
Average Queue (ft)	110	243	89	76	77	40
95th Queue (ft)	173	457	173	130	141	108
Link Distance (ft)		1210		190	190	
Upstream Blk Time (%)				0	0	0
Queuing Penalty (veh)				0	0	0
Storage Bay Dist (ft)	120		120			150
Storage Blk Time (%)	14	28	0		1	0
Queuing Penalty (veh)	50	81	2		2	0

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	90	162	157	154	348	88	196	110	239
Average Queue (ft)	49	56	56	43	159	15	81	16	88
95th Queue (ft)	95	128	120	125	285	51	175	60	196
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)							2		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	11	9		0	16	0	9	0	6
Queuing Penalty (veh)	9	8		1	8	0	3	0	2

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	176	186	196	60	202	178	192	207
Average Queue (ft)	90	97	99	25	104	82	108	107
95th Queue (ft)	152	168	175	48	182	152	173	180
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	48	31
Average Queue (ft)	20	8
95th Queue (ft)	42	30
Link Distance (ft)	982	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		190
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	123	180	65	81	240	150	239
Average Queue (ft)	46	72	46	6	82	40	58
95th Queue (ft)	97	146	65	37	192	101	160
Link Distance (ft)	502	360			853		436
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		28	12		4	0	1
Queuing Penalty (veh)		25	11		1	0	1

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	NB	SB	B20
Directions Served	LR	TR	LT	T
Maximum Queue (ft)	68	4	47	38
Average Queue (ft)	33	0	8	2
95th Queue (ft)	59	3	33	21
Link Distance (ft)	686	465	325	190
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	134	222	142	182	72	105
Average Queue (ft)	94	46	63	75	23	35
95th Queue (ft)	144	147	122	150	60	83
Link Distance (ft)		328	1005	1005	465	465
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	10					
Queuing Penalty (veh)	3					

Network Summary

Network wide Queuing Penalty: 421

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	B22
Directions Served	L	T	T	T	R>	<L	T	TR	L	T	R	T
Maximum Queue (ft)	141	173	139	253	441	200	865	853	165	405	225	404
Average Queue (ft)	62	97	59	62	279	193	665	567	154	333	131	260
95th Queue (ft)	125	162	126	349	487	232	1086	1041	206	483	292	581
Link Distance (ft)		1115	1115	1115			836	836		309		361
Upstream Blk Time (%)							51	7		57		49
Queuing Penalty (veh)							0	0		290		251
Storage Bay Dist (ft)	175				490	175			140			200
Storage Blk Time (%)	1	0		1	5	83	3		67	19		0
Queuing Penalty (veh)	1	0		3	4	235	8		239	56		1

Intersection: 3: Tremont Road & Northwest Boulevard & Fishinger Road

Movement	B24	SB	SB	SB	NW	NW	NW	NW
Directions Served	T	<L	T	R	<L	L	R	>
Maximum Queue (ft)	296	145	1110	145	166	163	157	101
Average Queue (ft)	184	128	743	100	73	78	44	4
95th Queue (ft)	470	174	1324	187	142	144	109	38
Link Distance (ft)	349		1210		168	168		
Upstream Blk Time (%)	23		15		0	0	0	
Queuing Penalty (veh)	118		0		0	1	0	
Storage Bay Dist (ft)		120		120			150	150
Storage Blk Time (%)		42	46	1		1	0	
Queuing Penalty (veh)		164	140	5		3	0	

Intersection: 7: Tremont Road & Zollinger Road

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	90	317	288	154	312	100	191	124	262
Average Queue (ft)	69	101	87	42	149	21	121	20	115
95th Queue (ft)	108	256	213	123	264	73	219	75	223
Link Distance (ft)		890	890		1410		171		853
Upstream Blk Time (%)							15		
Queuing Penalty (veh)							0		
Storage Bay Dist (ft)	65			130		75		100	
Storage Blk Time (%)	29	7		0	14	0	23		10
Queuing Penalty (veh)	24	10		0	8	1	9		3

Intersection: 8: Northwest Boulevard & Zollinger Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	192	188	214	59	223	208	223	217
Average Queue (ft)	91	97	101	27	127	97	111	110
95th Queue (ft)	154	170	176	52	200	174	180	182
Link Distance (ft)	1410	1410	1117	1117	846	846	1005	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 11: Tremont Road & Ridgecliff Road

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (ft)	233	294	175	357	56
Average Queue (ft)	65	131	22	170	10
95th Queue (ft)	201	326	124	507	34
Link Distance (ft)	979	306		426	
Upstream Blk Time (%)		23		14	
Queuing Penalty (veh)		0		69	
Storage Bay Dist (ft)			190		290
Storage Blk Time (%)				31	
Queuing Penalty (veh)				5	

Intersection: 13: Tremont Road & Milden Road

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	144	240	65	86	603	169	218
Average Queue (ft)	52	110	47	12	272	41	66
95th Queue (ft)	119	209	70	58	781	106	160
Link Distance (ft)	502	360			853		426
Upstream Blk Time (%)					6		
Queuing Penalty (veh)					34		
Storage Bay Dist (ft)			30	95		145	
Storage Blk Time (%)		38	27		26		1
Queuing Penalty (veh)		33	31		4		1

Intersection: 16: Northwest Boulevard & Trentwood Road

Movement	WB	SB	B20
Directions Served	LR	LT	T
Maximum Queue (ft)	80	38	40
Average Queue (ft)	37	8	3
95th Queue (ft)	64	29	23
Link Distance (ft)	688	339	168
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Northwest Boulevard & Kingsdale Shopping Center Signal

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	134	300	225	206	88	133
Average Queue (ft)	115	114	106	99	23	45
95th Queue (ft)	153	271	197	188	67	99
Link Distance (ft)		328	1005	1005	461	461
Upstream Blk Time (%)		0				
Queuing Penalty (veh)		0				
Storage Bay Dist (ft)	110					
Storage Blk Time (%)	25	0				
Queuing Penalty (veh)	24	0				

Network Summary

Network wide Queuing Penalty: 1774
