SR-15 Mid-City Station Area Planning Study

Mobility Analysis Final Report

Submitted to City of San Diego Development Services Department

by IBI Group

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Introduction and Purpose of the Mobility Analysis Report

New bus rapid transit (BRT) facilities and services are planned for SR-15 in Mid-City as part of the region's efforts to enhance the performance and attractiveness of transit. Included in the improvements are new transit stations at El Cajon Boulevard and University Avenue. The Mid-City Station Area Planning Study is being undertaken by the City of San Diego to take advantage of the planned transit facilities and services to spur land use improvements in the areas near the stations.

Funded by a Smart Growth grant from SANDAG, the study aims to develop a vision and identify implementation actions to foster transit oriented development in the study area on both sides of SR-15. The study includes a planning analysis of land use, mobility, and economic considerations to develop plans and policies to support development that makes the most of the increased travel options the BRT will bring.

The purpose of the Mobility Analysis Technical Memo is to document the elements and condition of the future transportation system in the study area. Included is information on traffic, transit system, bicycle, and pedestrian facilities. This information will identify opportunities and constraints for integration with transit oriented land uses, and provide a basis for the consideration of alternative visions and development scenarios to be developed in the study.

Traffic Analysis

Summary of Existing Conditions

The SR-15 Station Area Planning Study – Mobility Analysis Existing Conditions Technical Memo (June 2011) included analysis and assessment of the existing conditions within the study area. The study area included 18 study intersections analyzed using the Synchro software package with HCM reporting methods. All of the intersections within the study area were calculated to operate at LOS D or better overall during the AM and PM peak hours. There were four intersections with approaches operating at LOS E during either the AM or PM peak hour:

- El Cajon Boulevard at SR-15 southbound ramp terminal – eastbound and westbound approaches operate at LOS E during the PM peak hour.
- El Cajon Boulevard at 43rd Street southbound ramp terminal – southbound approach operates at LOS E during the AM peak hour.
- El Cajon Boulevard at Fairmount Avenue – northbound approach operates at LOS E during the AM peak hour.
- University Avenue at 41st Street – northbound approach operates at LOS E during the PM peak hour.

Queue lengths at the study intersections were also examined to evaluate whether or not adequate storage is available during the peak hours. Both the 50th and 95th percentile queue lengths were reported as calculated in Synchro. Nine of the 18 intersections were calculated to experience queue lengths that exceed the available storage length during the AM and/or PM peak hours.

Details related to the existing conditions analysis are included in the SR-15 Station Area Planning Study – Mobility Analysis Existing Conditions Technical Memo (June 2011).

Future Mobility Study Area

The study area analyzed for the future mobility analysis included nine out of the 18 study area intersection included in the existing conditions mobility analysis. These key intersections were selected because all the other non-signalized intersections operate at LOS C or better under existing conditions. The land uses to increase under future conditions are mainly concentrated on El Cajon Boulevard and University Avenue and closest to SR-15. Therefore, it is not expected that the other intersections would be significantly impacted under future conditions and thus were not included in the future mobility analysis. In addition, four roadway segments were included in the analysis for future mobility. The study area intersections for future 2035 mobility include:

- El Cajon Boulevard at 37th Street
- El Cajon Boulevard at SR-15 southbound ramp terminal
- El Cajon Boulevard at SR-15 northbound ramp terminal
- El Cajon Boulevard at Marlborough Avenue
- University Avenue at 39th Street
- University Avenue at SR-15 southbound ramp terminal
- University Avenue at SR-15 northbound ramp terminal
- University Avenue at 41st Street
- University Avenue at Marlborough Avenue

The study area roadway segments included in the future 2035 mobility analysis include:

- El Cajon Boulevard between 37th Street and SR15
- El Cajon Boulevard between SR15 and Marlborough Avenue
- University Avenue between 39th Street and SR15
- University Avenue between SR15 and Marlborough Avenue

Future 2035 Scenarios & Forecast Model

Scenarios

There were two future scenarios analyzed for the SR-15 Station Area Planning Study. The two scenarios included the 2035 Adopted Community Plan and the 2035 Proposed Land Use Project Scenario. The Adopted Community Plan Scenario is based on the land uses within the currently adopted Community Plan. The Proposed Land Use Plan scenario is based on the proposed adjustments to the planned land uses for the study area surrounding the BRT stations on El Cajon Boulevard and University Avenue. In general, the Proposed Land Use Plan changes were focused on shifting the intensity of the land uses within the study area. However, there were some changes in the net difference of mixed use commercial and multi-family residential dwelling units. The Adopted Community Plan and Proposed Land Use Project scenario trip generation comparison are shown in Tables 1 and 2. The more detailed comparison table that includes the land use assumptions (and trip generation comparison) for each scenario is included under Appendix A.

Table 1 Comparison between Existing and Adopted Community Plan

	Commercial				Residential				Total	
Plan	Commercial Floor Area (sf)	Percent Change	Commercial Trips Generated	Percent Change	Dwelling Units (DU)	Percent Change	Residential Trips Generated	Percent Change	Total Trips Generated	Percent Change
Existing Conditions (2008)	1,767,578	-	52,858	-	6,320	-	41,358	-	102,182	-
Adopted Community Plan (2035)	1,756,388	-0.6%	51,810	-2.0%	7,483	15.5%	48,201	14.2%	110,499	7.5%

Table 2 Comparison between Existing and Adopted Community Plan

	Commercial				Residential				Total	
Plan	Commercial Floor Area (sf)	Percent Change	Commercial Trips Generated	Percent Change	Dwelling Units (DU)	Percent Change	Residential Trips Generated	Percent Change	Total Trips Generated	Percent Change
Existing Conditions (2008)	1,767,578	-	52,858	-	6,320	-	41,358	-	102,182	-
Proposed Land Use Plan (2035)	1,676,102	-5.5%	49,025	-7.8%	7,786	18.8%	50,136	17.5%	109,648	6.8%

Forecast Model

The 2035 Series 12 model was used for modeling the 2035 Adopted Community Plan scenario and the 2035 Proposed Land Use scenario. The 2035 Series 12 model is based on the currently adopted community plans and circulation elements for the region. Therefore, the Series 12 2035 model was used for the 2035 Adopted Community Plan scenario analysis. The 2035 Proposed Land Use scenario was based on the proposed modifications to the land uses for the study area. The model land uses within the TAZs for the study area were adjusted to reflect the proposed land uses. The Series 12 2035 Base Year, 2035, and Proposed transportation model outputs are included in Appendix B.

In order to determine the appropriate future traffic volumes to be used in analysis, the City of San Diego historical traffic volumes (2002-2012) and Series 11 model forecast traffic volumes were reviewed and compared to the Series 12 model forecast traffic volumes. The comparison table is provided in Appendix B. Based on these reviews, the SANDAG Series 12 forecast traffic volumes were adjusted, as appropriate. The recommended forecast ADT volume adjustments are documented in Appendix C.

The intersection peak hour turning movement volumes were developed using an Excel spreadsheet template that calculates the peak hour traffic at an intersection from future ADT volumes using the relationship between existing peak hour turn movements and the existing ADT volumes based on the NCHRP Report 255. The parameters needed for the turning movement calculation were existing volumes, future ADTs, K- and D-factor estimates. The iterative method is based on an incremental procedure of applying implied growth between the base year and future year to actual traffic counts. Existing turning movement volumes and ADTs were available from the SR-15 Station Area Planning Study – Mobility Analysis Existing Conditions Technical Memo (June 2011). Future ADT volumes were taken from the SANDAG Series 12 model for 2035 with adjustments, as appropriate.

The K factors were estimated for the AM and PM peak hours (8% and 10%, respectively) based on the design hour factor (K) range of 0.07-0.11 provided in the City of San Diego's Traffic Impact Study Manual (July 1998). The City's TIS Manual shows the directional factor (D) range between 0.55-0.75. However, the D factor was determined using turning movement approach and departure volumes at each intersection included in the study. Future turning movement volumes were

computed using the relationship between existing and future ADTs and the K- and D-factors using an Excel spreadsheet. All future intersection volumes were rounded to the nearest 10th. The model did take into account the differences in land uses based on the input provided to SANDAG for the 2035 Proposed Land Use scenario. The land use changes were provided by TAZ and modified before the model was run. In addition, the zone connectors from the TAZs were modified slightly to ensure that trips were loading onto portions of the segments expected to have higher densities.

Analysis Methodology & Significance Criteria

The traffic analysis for all future scenarios has been prepared consistent with the City of San Diego Traffic Impact Study Manual.

Segments

The analysis of the roadway segments is based on the guidelines set forth in the City of San Diego Traffic Impact Study Manual. The LOS thresholds and roadway classification table are taken from the City of San Diego Traffic Impact Study Manual and provided in Appendix D.

Intersections

Signalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 16 of the 2010 Highway Capacity Manual (HCM), with the assistance of the Synchro (version 7) software. The delay values (represented in seconds) were qualified with a corresponding intersection LOS, as shown in Table 3.

Table 3 Level of Service Thresholds for Signalized Intersections

Average Control Delay Per Vehicle (Seconds/Vehicle)			Level Of Service
0.0	≤	10.0	A
10.1	to	20.0	B
21.1	to	35.0	C
35.1	to	55.0	D
55.1	to	80.0	E
	≥	80.0	F

Source: Highway Capacity Manual, 2010.

Significance Criteria

The City of San Diego accepts LOS D as the acceptable service standards for roadway segments and intersections.

2035 Adopted Community Plan Scenario Traffic Analysis

Segment Analysis

Traffic analysis for the four study area street segments was based on the City of San Diego LOS thresholds and roadway classifications table. Table 4 shows the volume to capacity results. As shown in Table 4, all of the study area street segments are expected to operate at LOS D or better for the 2035 Adopted Community Plan scenario.

Table 4 Segment ADT and LOS Analysis Results – 2035 Adopted Community Plan Scenario

Street	Lanes	Classification	LOS E Capacity[a]	ADT[b]	LOS[c]	V/C[d]
El Cajon Boulevard						
37th Street and SR-15	6D	Major Arterial	50,000	28,000	B	0.560
SR-15 and Marlborough Avenue	6D	Major Arterial	50,000	39,000	C	0.780
University Avenue						
39th Street and SR-15	4D	Major Arterial	40,000	27,000	C	0.675
SR-15 and Marlborough Avenue	4D	Major Arterial	40,000	33,000	D	0.825

Footnotes:

a. LOS E capacity is based on criteria established in the City of San Diego Roadway Classifications, LOS & ADT Table
b. ADT – average daily traffic volumes
c. LOS – level of service
d. V/C – volume to capacity ratio

Intersection Analysis

Traffic analysis for the nine study intersections was based on the methodologies in the Highway Capacity Manual (HCM). Intersection operations were assessed using the Synchro software package, using the "HCM reports" function. Other than the planned light-rail on El Cajon Boulevard, there are no planned network improvements to the study area. Therefore, the existing condition geometrics and traffic controls were used in the intersection analysis. The existing signal timing was initially used as the base timing entered and then optimized based on each scenario. The analysis for each movement as well as the overall intersection level of service (LOS) results for the AM and PM peak hours at each of the study intersections is summarized in Table 5. The Synchro analysis sheets for the 2035 Adopted Community Plan Scenario is included in Appendix E.

As shown in Table 5, several of the intersections are expected to operate at LOS D or better during the AM and/or PM peak hours. The following three intersections are expected to operate at LOS E or F during either the AM or PM peak hour:

- El Cajon Boulevard at SR-15 southbound ramp terminal – LOS E during the PM peak hour
- University Avenue at SR-15 northbound ramp terminal – LOS E during the AM peak hour
- University Avenue at 41st Street – LOS E during the AM peak hour

The approaches for each intersection that contributed to the overall intersection operations failure are shown in Table 5.

Table 5 Intersection LOS Analysis Results – 2035 Adopted Community Plan Scenario

#	Control	Intersection	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
1	**S**	**El Cajon Boulevard at 37th**				
		Northbound Approach	19.1	B	19.3	B
		Southbound Approach	18.8	B	18.7	B
		Eastbound Approach	11.8	B	24.4	B
		Westbound Approach	15.7	B	18.5	C
		Overall	**14.8**	**B**	**21.1**	**C**
2	**S**	**El Cajon Boulevard at SR-15 SB Ramp**				
		Northbound Approach	n/a	n/a	n/a	n/a
		Southbound Approach	28.3	C	79.6	E
		Eastbound Approach	47.2	D	95.5	F
		Westbound Approach	48.9	D	44.3	D
		Overall	**44.3**	**D**	**75.9**	**E**
3	**S**	**El Cajon Boulevard at SR-15 NB Ramp**				
		Northbound Approach	32.1	C	38.3	C
		Southbound Approach	n/a	n/a	n/a	n/a
		Eastbound Approach	32.3	C	27.9	C
		Westbound Approach	39.8	D	41.3	D
		Overall	**36.0**	**D**	**34.6**	**D**
4	**S**	**El Cajon Boulevard at Marlborough**				
		Northbound Approach	21.3	C	24.2	C
		Southbound Approach	17.0	B	20.6	C
		Eastbound Approach	19.4	B	30.5	C
		Westbound Approach	21.2	C	28.4	C
		Overall	**20.4**	**C**	**28.9**	**C**
5	**S**	**University Avenue at 39th**				
		Northbound Approach	15.2	B	20.0	C
		Southbound Approach	48.5	D	56.2	E
		Eastbound Approach	39.3	D	33.1	C
		Westbound Approach	16.6	B	34.3	C
		Overall	**29.3**	**C**	**36.4**	**D**
6	**S**	**University Avenue at SR-15 SB Ramp**				
		Northbound Approach	n/a	n/a	n/a	n/a
		Southbound Approach	24.5	C	37.1	D
		Eastbound Approach	26.8	C	44.7	D
		Westbound Approach	30.2	C	30.7	C
		Overall	**27.3**	**C**	**37.9**	**D**

#	Control	Intersection	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
7	**S**	**University Avenue at SR-15 NB Ramp**				
		Northbound Approach	47.9	D	24.2	C
		Southbound Approach	n/a	n/a	n/a	n/a
		Eastbound Approach	43.6	D	28.6	C
		Westbound Approach	72.6	E	27.6	C
		Overall	**57.2**	**E**	**27.1**	**C**
8	**S**	**University Avenue at 41st**				
		Northbound Approach	141.4	F	103.6	E
		Southbound Approach	28.1	C	29.7	C
		Eastbound Approach	19.0	B	22.5	C
		Westbound Approach	95.3	F	64.1	E
		Overall	**69.3**	**E**	**45.6**	**D**
9	**S**	**University Avenue at Marlborough**				
		Northbound Approach	26.4	C	110.1	F
		Southbound Approach	29.1	C	49.0	D
		Eastbound Approach	8.7	A	17.4	B
		Westbound Approach	19.7	B	68.0	E
		Overall	**17.1**	**B**	**44.9**	**D**

S = Signalized

Queue lengths at the study intersections were also examined to evaluate whether adequate storage is available during the peak hours. Table 6 reports the available turn pocket storage and the existing queue lengths for each movement at the signalized study intersections. Both the 50th and 95th percentile queue lengths are reported in Table 6 as calculated in Synchro.

As shown in Table 6, eight of the nine intersections experience queue lengths that exceed the available storage length during the AM, PM or both peak hours. A listing of each of these locations (95 percentile discussed) is provided below.

- The eastbound left-turn queue length at El Cajon Boulevard and 37th Street exceeds the available storage by approximately 34 feet during the PM peak hour.
- The southbound left-turn queue length at El Cajon Boulevard and SR-15 southbound ramp terminal exceeds available storage by approximately 273 feet during the PM peak hour.
- The southbound right-turn queue length at El Cajon Boulevard and SR-15 southbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 350 feet.
- The eastbound right-turn queue length at El Cajon Boulevard and SR-15 southbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 304 feet.
- The westbound left-turn queue length at El Cajon Boulevard and SR-15 southbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 774 feet.

- The northbound right-turn queue length at El Cajon Boulevard and SR-15 northbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 199 feet.
- The eastbound left-turn queue length at El Cajon Boulevard and SR-15 northbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 238 feet.
- The westbound right-turn queue length at El Cajon Boulevard and SR-15 northbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the AM peak hour and exceeds available storage by approximately 470 feet.
- The eastbound left-turn queue length at El Cajon Boulevard and Marlborough Avenue exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 125 feet.
- The westbound left-turn queue length at El Cajon Boulevard and Marlborough Avenue exceeds available storage by approximately 40 feet during the PM peak hour.
- The southbound left-turn queue length at University Avenue at 39th Street exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 107 feet.
- The southbound left-turn queue length at University Avenue and SR-15 southbound ramp terminal exceeds available storage by approximately 4 feet during the PM peak hour.
- The eastbound right-turn queue length at University Avenue and SR-15 southbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 328 feet.
- The westbound left-turn queue length at University Avenue and SR-15 southbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 320 feet.
- The eastbound left-turn queue length at University Avenue and SR-15 northbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the AM peak hour and exceeds available storage by approximately 555 feet.
- The westbound right-turn queue length at University Avenue and SR-15 northbound ramp terminal exceeds available storage by approximately 633 feet during the AM peak hour.
- The eastbound left-turn queue length at University Avenue and 41st Street exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 48 feet.

The queue lengths at these eight intersections were taken into consideration when developing multimodal transportation improvements to the study area. Many of these queues exceed the length of available storage for the block and therefore cannot be extended to increase storage capacity or cannot be extended due to another left-turn pocket for the adjacent intersection. The locations on El Cajon Boulevard where a left- or right-turn pocket could physically be extended to create more turn lane storage capacity would cut into the existing median removing potential right-of-way that might otherwise be used for transit or other multimodal transportation improvements.

Figures 1 and 2 depict the 2035 Adopted Community Plan AM and PM peak turning movement volumes at the nine intersections.

Table 6 Intersection Queue Analysis Results – 2035 Adopted Community Plan Scenario

#	Control	Intersection Movement	Turn Bay or Block Length (feet)	Queue Length (feet)			
				AM Peak Hour		PM Peak Hour	
				50%	95%	50%	95%
1	**S**	**El Cajon Boulevard at 37th**					
		NBT	600	46	92	53	100
		SBT	600	37	76	37	75
		EBL	100	16	41	44	**134**
		EBT	590	73	98	197	245
		WBT	590	93	161	241	326
2	**S**	**El Cajon Boulevard at SR-15 SB Ramp**					
		SBL	200	109	152	**355**	**473**
		SBT	730	91	157	369	598
		SBR	110	58	**121**	**269**	**460**
		EBT	620	200	241	**671**	**744**
		EBR	100	62	**172**	**263**	**404**
		WBL	210	**494**	**721**	**739**	**984**
		WBT	210	170	224	173	199
3	**S**	**El Cajon Boulevard at SR-15 NB Ramp**					
		NBL	140	52	80	60	91
		NBT	760	136	236	230	351
		NBR	150	132	**231**	**227**	**349**
		EBL	210	**277**	**401**	**256**	**448**
		EBT	210	76	90	**486**	**563**
		WBT	580	277	322	298	346
		WBR	90	**312**	**560**	**268**	**522**
4	**S**	**El Cajon Boulevard at Marlborough**					
		NBT	610	75	139	92	165
		SBT	610	14	41	42	86
		EBL	95	42	**118**	**103**	**220**
		EBT	580	150	196	349	475
		WBL	90	23	64	49	**130**
		WBT	590	228	329	267	366
5	**S**	**University Avenue at 39th**					
		NBL	100	21	48	23	54
		NBT	600	62	127	34	87
		SBL	230	141	**302**	**171**	**337**
		SBT	590	30	69	57	110
		EBL	150	5	17	16	79
		EBT	310	**326**	**574**	**410**	**701**
		WBL	150	20	83	22	97
		WBT	300	169	269	**745**	**315**

#	Control	Intersection Movement	Turn Bay or Block Length (feet)	Queue Length (feet)			
				AM Peak Hour		PM Peak Hour	
				50%	95%	50%	95%
		WBR	70	0	41	0	30
6	**S**	**University Avenue at SR-15 SB Ramp**					
		SBL	250	78	114	191	**254**
		SBT	560	80	149	225	373
		SBR	100	13	66	**107**	**212**
		EBT	300	182	230	251	**329**
		EBR	95	53	**172**	**214**	**423**
		WBL	220	**240**	**413**	**329**	**540**
		WBT	220	110	147	140	181
7	**S**	**University Avenue at SR-15 NB Ramp**					
		NBL	365	114	159	65	97
		NBR	365	26	86	173	247
		EBL	220	**544**	**775**	174	**338**
		EBT	220	118	145	**301**	**393**
		WBT	315	186	225	154	199
		WBR	225	**597**	**858**	0	95
8	**S**	**University Avenue at 41st**					
		NBT	580	375	578	310	505
		SBT	130	65	79	46	79
		EBL	42	40	**89**	17	**90**
		EBT	315	231	287	**546**	**678**
		WBL	155	6	18	7	31
		WBT	300	**1075**	**1337**	**985**	**1248**
9	**S**	**University Avenue at Marlborough**					
		NBT	600	84	155	208	377
		SBT	600	82	154	174	323
		EBL	150	10	39	21	102
		EBT	300	116	156	**412**	**518**
		WBL	150	9	25	30	78
		WBT	300	**389**	**683**	**926**	**1184**

S = Signalized

Indicates where queue length exceeds available storage.

Figure 1 2035 Adopted Community Plan Scenario – AM Peak Hour Traffic Volumes

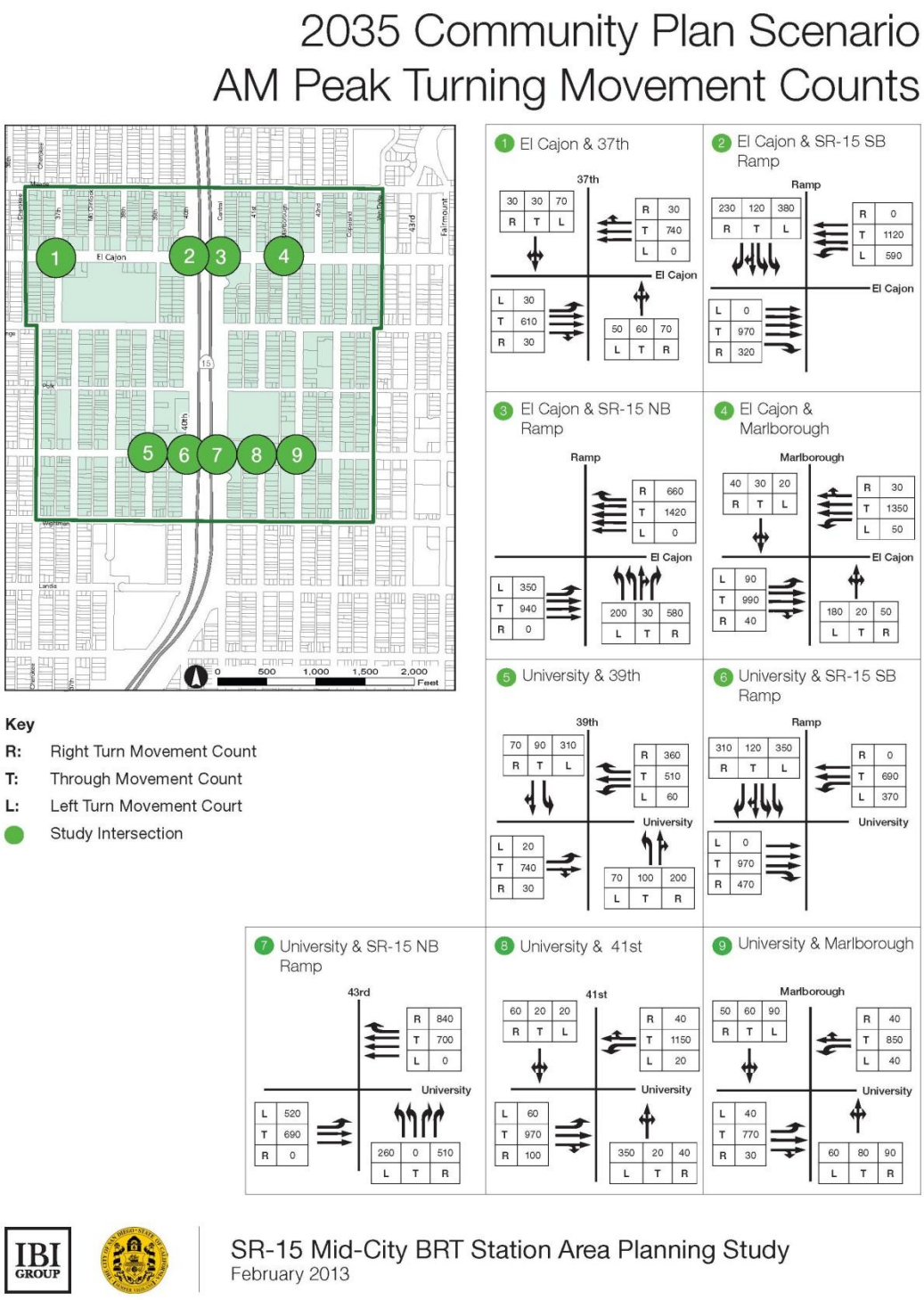
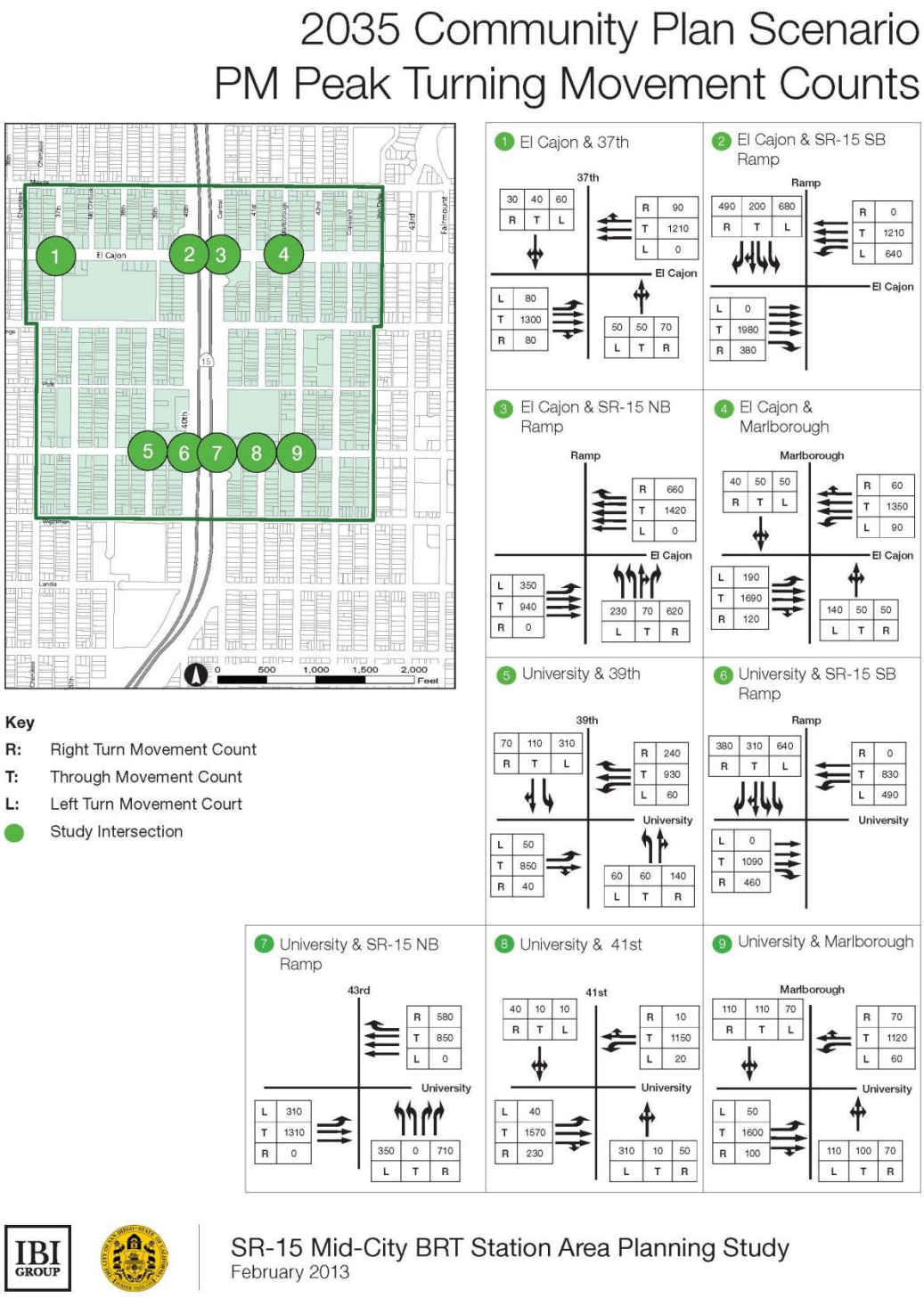


Figure 2 2035 Adopted Community Plan Scenario – PM Peak Hour Traffic Volumes



2035 Proposed Land Use Project Scenario Traffic Analysis

Segment Analysis

Traffic analysis for the four study area street segments was based on the City of San Diego LOS thresholds and roadway classifications table. Table 7 shows the volume to capacity results. As shown in Table 7, all of the study area street segments are expected to operate at LOS D or better for the 2035 Proposed Land Use Project scenario.

Table 7 Segment ADT and LOS Analysis Results – 2035 Proposed Land Use Project Scenario

Street	Lanes	Classification	LOS E Capacity[a]	ADT[b]	LOS[c]	V/C[d]
El Cajon Boulevard						
37th Street and SR-15	6D	Major Arterial	50,000	29,000	C	0.580
SR-15 and Marlborough Avenue	6D	Major Arterial	50,000	40,000	C	0.800
University Avenue						
39th Street and SR-15	4D	Major Arterial	40,000	32,000	D	0.800
SR-15 and Marlborough Avenue	4D	Major Arterial	40,000	33,000	D	0.825

Footnotes:

a. LOS E capacity is based on criteria established in the City of San Diego Roadway Classifications, LOS & ADT Table
b. ADT – average daily traffic volumes
c. LOS – level of service
d. V/C – volume to capacity ratio

Intersection Analysis

Traffic analysis for the 2035 Proposed Land Use Project scenario was conducted under the same assumptions and methodologies as the 2035 Adopted Community Plan scenario. The analysis for each movement as well as the overall intersection level of service (LOS) results for the AM and PM peak hours at each of the study intersections is summarized in Table 8. The Synchro analysis sheets for the 2035 Adopted Community Plan Scenario are included in Appendix F.

As shown in Table 8, four of the nine intersections are expected to operate at LOS E or F during either the AM or PM peak hour:

- El Cajon Boulevard at SR-15 southbound ramp terminal – LOS E during the PM peak hour
- University Avenue at SR-15 northbound ramp terminal – LOS E during the AM peak hour
- University Avenue at 41st Street – LOS F during the AM peak hour and LOS E during the PM peak hour
- University Avenue at Marlborough Avenue – LOS E during the PM peak hour

The approaches for each intersection that contributed to the overall intersection operations failure is shown in Table 8.

Table 8 Intersection LOS Analysis Results – 2035 Proposed Land Use Project Scenario

#	Control	Intersection	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
1	**S**	**El Cajon Boulevard at 37th**				
		Northbound Approach	18.7	B	19.3	B
		Southbound Approach	18.8	B	18.7	B
		Eastbound Approach	11.8	B	18.5	B
		Westbound Approach	15.7	B	24.1	C
		Overall	**14.7**	**B**	**20.9**	**C**
2	**S**	**El Cajon Boulevard at SR-15 SB Ramp**				
		Northbound Approach	n/a	n/a	n/a	n/a
		Southbound Approach	28.0	C	76.2	E
		Eastbound Approach	44.7	C	73.8	E
		Westbound Approach	34.0	D	37.6	D
		Overall	**36.5**	**D**	**62.6**	**E**
3	**S**	**El Cajon Boulevard at SR-15 NB Ramp**				
		Northbound Approach	37.8	D	49.9	D
		Southbound Approach	n/a	n/a	n/a	n/a
		Eastbound Approach	30.8	C	27.0	C
		Westbound Approach	41.9	D	43.2	D
		Overall	**37.7**	**D**	**36.9**	**D**
4	**S**	**El Cajon Boulevard at Marlborough**				
		Northbound Approach	20.0	C	22.1	C
		Southbound Approach	18.1	B	21.1	C
		Eastbound Approach	18.6	B	25.3	C
		Westbound Approach	18.4	B	28.8	C
		Overall	**18.6**	**B**	**26.3**	**C**
5	**S**	**University Avenue at 39th**				
		Northbound Approach	17.5	B	23.8	C
		Southbound Approach	57.5	E	74.8	E
		Eastbound Approach	41.0	D	40.6	D
		Westbound Approach	16.5	B	42.4	D
		Overall	**31.6**	**C**	**45.2**	**D**
6	**S**	**University Avenue at SR-15 SB Ramp**				
		Northbound Approach	n/a	n/a	n/a	n/a
		Southbound Approach	24.6	C	39.0	D
		Eastbound Approach	27.4	C	48.9	D
		Westbound Approach	29.7	C	30.5	C
		Overall	**27.5**	**C**	**40.0**	**D**

#	Control	Intersection	AM Peak Hour		PM Peak Hour	
			Delay (sec)	LOS	Delay (sec)	LOS
7	**S**	**University Avenue at SR-15 NB Ramp**				
		Northbound Approach	54.9	D	24.6	C
		Southbound Approach	n/a	n/a	n/a	n/a
		Eastbound Approach	39.1	D	30.4	C
		Westbound Approach	70.5	E	30.1	C
		Overall	**56.0**	**E**	**28.9**	**C**
8	**S**	**University Avenue at 41st**				
		Northbound Approach	199.2	F	140.4	F
		Southbound Approach	31.7	C	30.8	C
		Eastbound Approach	31.2	C	32.8	C
		Westbound Approach	130.9	F	90.9	F
		Overall	**98.3**	**F**	**64.5**	**E**
9	**S**	**University Avenue at Marlborough**				**3333**
		Northbound Approach	32.7	C	134.1	F
		Southbound Approach	34.9	C	69.3	E
		Eastbound Approach	8.8	A	19.6	B
		Westbound Approach	24.1	C	95.9	F
		Overall	**19.7**	**B**	**58.1**	**E**

S = Signalized

Queue lengths at the study intersections were also examined to evaluate whether or not adequate storage is available during the peak hours. Table 9 reports the available turn pocket storage and the existing queue lengths for each movement at the signalized study intersections. Both the 50th and 95th percentile queue lengths for the 2035 Proposed Land Uses scenario are reported in Table 9 as calculated in Synchro.

As shown in Table 9, eight of the nine intersections experience queue lengths that exceed the available storage length during the AM, PM or both peak hours. A listing of each of these locations (95 percentile discussed) is provided below.

- The eastbound left-turn queue length at El Cajon Boulevard and 37th Street exceeds the available storage by approximately 34 feet during the PM peak hour.
- The southbound left-turn queue length at El Cajon Boulevard and SR-15 southbound ramp terminal exceeds available storage by approximately 222 feet during the PM peak hour.
- The southbound right-turn queue length at El Cajon Boulevard and SR-15 southbound ramp terminal exceeds available storage by approximately 326 feet during the PM peak hour.
- The eastbound right-turn queue length at El Cajon Boulevard and SR-15 southbound ramp terminal exceeds available storage by approximately 325 feet during the PM peak hour.
- The westbound left-turn queue length at El Cajon Boulevard and SR-15 southbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 689 feet.

- The northbound right-turn queue length at El Cajon Boulevard and SR-15 northbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 288 feet.
- The eastbound left-turn queue length at El Cajon Boulevard and SR-15 northbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the AM peak hour and exceeds available storage by approximately 296 feet.
- The westbound right-turn queue length at El Cajon Boulevard and SR-15 northbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the AM peak hour and exceeds available storage by approximately 558 feet.
- The eastbound left-turn queue length at El Cajon Boulevard and Marlborough Avenue exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 168 feet.
- The southbound left-turn queue length at University Avenue at 39th Street exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 142 feet.
- The southbound left-turn queue length at University Avenue and SR-15 southbound ramp terminal exceeds available storage by approximately 27 feet during the PM peak hour.
- The southbound right-turn queue length at University Avenue and SR-15 southbound ramp terminal exceeds available storage by approximately 136 feet during the PM peak hour.
- The eastbound right-turn queue length at University Avenue and SR-15 southbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 334 feet.
- The westbound left-turn queue length at University Avenue and SR-15 southbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the PM peak hour and exceeds available storage by approximately 320 feet.
- The eastbound left-turn queue length at University Avenue and SR-15 northbound ramp terminal exceeds available storage during both peak hours. The longest queue length is during the AM peak hour and exceeds available storage by approximately 648 feet.
- The westbound right-turn queue length at University Avenue and SR-15 northbound ramp terminal exceeds available storage by approximately 707 feet during the AM peak hour.
- The eastbound left-turn queue length at University Avenue and 41st Street exceeds available storage during both peak hours. The longest queue length is during the AM peak hour and exceeds available storage by approximately 99 feet

As stated for the 2035 Adopted Community Plan scenario, the queue lengths at these eight intersections were taken into consideration when developing multimodal transportation improvements to the study area.

Figures 3 and 4 depict the 2035 Proposed Land Use AM and PM peak turning movement volumes at the nine intersections.

Table 9 Intersection Queue Analysis Results – 2035 Proposed Land Use Project Scenario

#	Control	Intersection Movement	Turn Bay or Block Length (feet)	Queue Length (feet)			
				AM Peak Hour		PM Peak Hour	
				50%	95%	50%	95%
1	**S**	**El Cajon Boulevard at 37th**					
		NBT	600	35	75	53	99
		SBT	600	37	76	37	75
		EBL	100	16	41	44	**134**
		EBT	590	72	97	195	242
		WBT	590	91	159	235	302
2	**S**	**El Cajon Boulevard at SR-15 SB Ramp**					
		SBL	200	99	139	**323**	**422**
		SBT	730	91	157	370	601
		SBR	110	50	111	**252**	**436**
		EBT	620	183	222	586	**660**
		EBR	100	51	155	**267**	**425**
		WBL	210	**413**	**646**	**658**	**899**
		WBT	210	142	173	158	183
3	**S**	**El Cajon Boulevard at SR-15 NB Ramp**					
		NBL	140	60	91	73	108
		NBT	760	147	255	271	435
		NBR	150	142	**248**	**268**	**438**
		EBL	210	**302**	**506**	**289**	**486**
		EBT	210	128	155	**470**	**535**
		WBT	580	282	326	307	352
		WBR	90	**408**	**648**	**339**	**609**
4	**S**	**El Cajon Boulevard at Marlborough**					
		NBT	610	50	97	61	114
		SBT	610	17	46	42	86
		EBL	95	51	**129**	**129**	**263**
		EBT	580	104	178	287	353
		WBL	90	14	39	32	90
		WBT	590	204	293	249	346
5	**S**	**University Avenue at 39th**					
		NBL	100	23	53	27	60
		NBT	600	64	131	46	105
		SBL	230	154	**314**	208	**372**
		SBT	590	30	70	62	118
		EBL	150	5	17	19	90
		EBT	310	**387**	**657**	**540**	**864**
		WBL	150	21	90	26	110
		WBT	300	196	**304**	**612**	**911**

#	Control	Intersection Movement	Turn Bay or Block Length (feet)	Queue Length (feet)			
				AM Peak Hour		PM Peak Hour	
				50%	95%	50%	95%
		WBR	70	0	39	2	32
6	**S**	**University Avenue at SR-15 SB Ramp**					
		SBL	250	83	121	210	**277**
		SBT	560	81	150	240	404
		SBR	100	22	78	**124**	**236**
		EBT	300	191	241	263	**350**
		EBR	95	60	**183**	**218**	**429**
		WBL	220	**240**	**413**	**329**	**540**
		WBT	220	116	155	147	189
7	**S**	**University Avenue at SR-15 NB Ramp**					
		NBL	365	129	177	68	100
		NBR	365	53	124	177	252
		EBL	220	**629**	**868**	206	**367**
		EBT	220	136	164	**350**	**510**
		WBT	315	219	260	171	220
		WBR	225	**668**	**932**	0	97
8	**S**	**University Avenue at 41st**					
		NBT	580	540	763	416	624
		SBT	130	44	96	12	50
		EBL	42	**83**	**141**	32	**77**
		EBT	315	309	373	716	962
		WBL	155	8	23	8	38
		WBT	300	1408	1677	1184	1452
9	**S**	**University Avenue at Marlborough**					
		NBT	600	98	174	220	392
		SBT	600	86	158	196	364
		EBL	150	13	72	24	66
		EBT	300	138	182	**540**	**670**
		WBL	150	9	25	38	90
		WBT	300	**530**	**880**	**1217**	**1484**

S = Signalized

Indicates where queue length exceeds available storage.

Figure 3 2035 Proposed Land Uses Scenario – AM Peak Hour Traffic Volumes

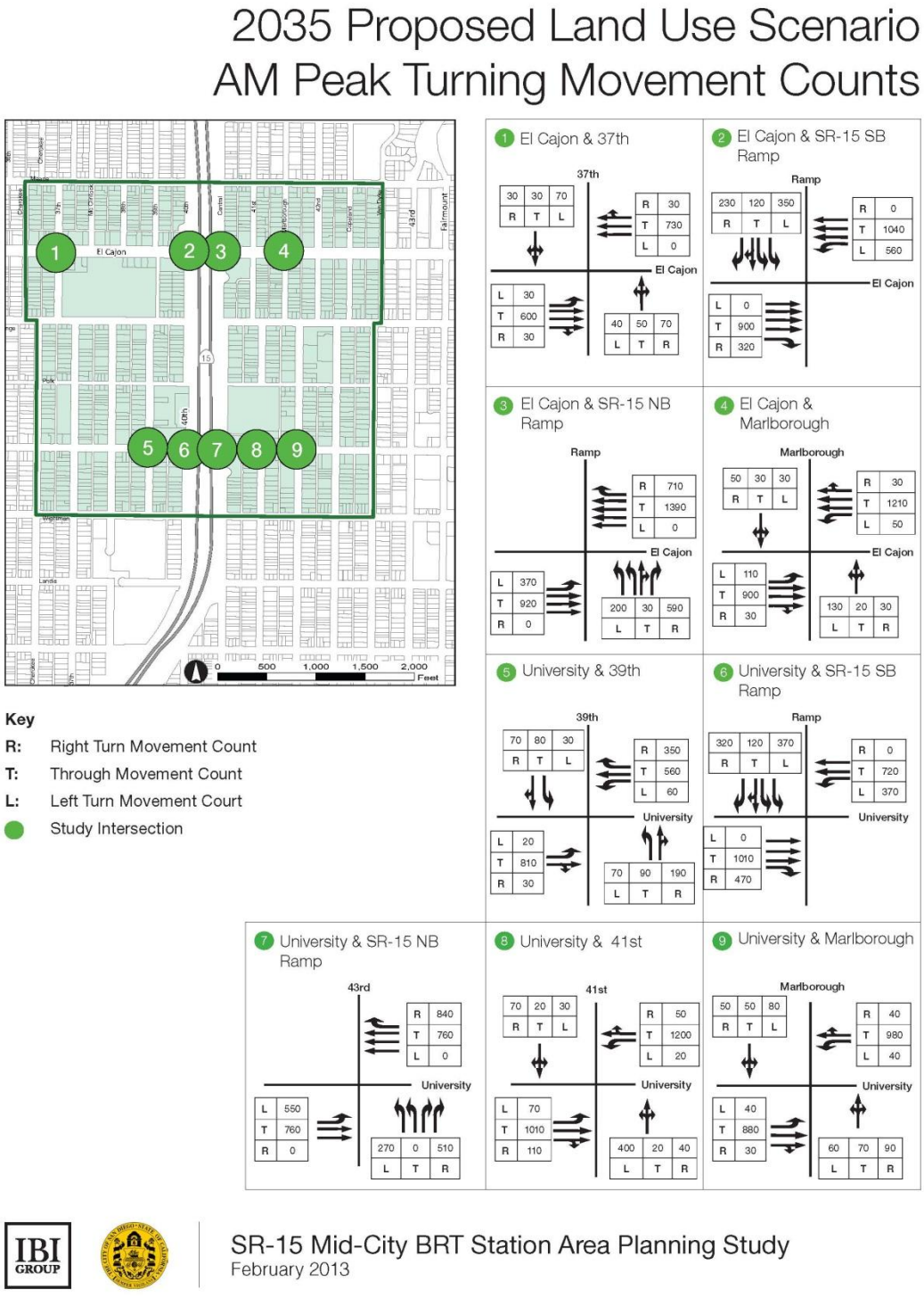
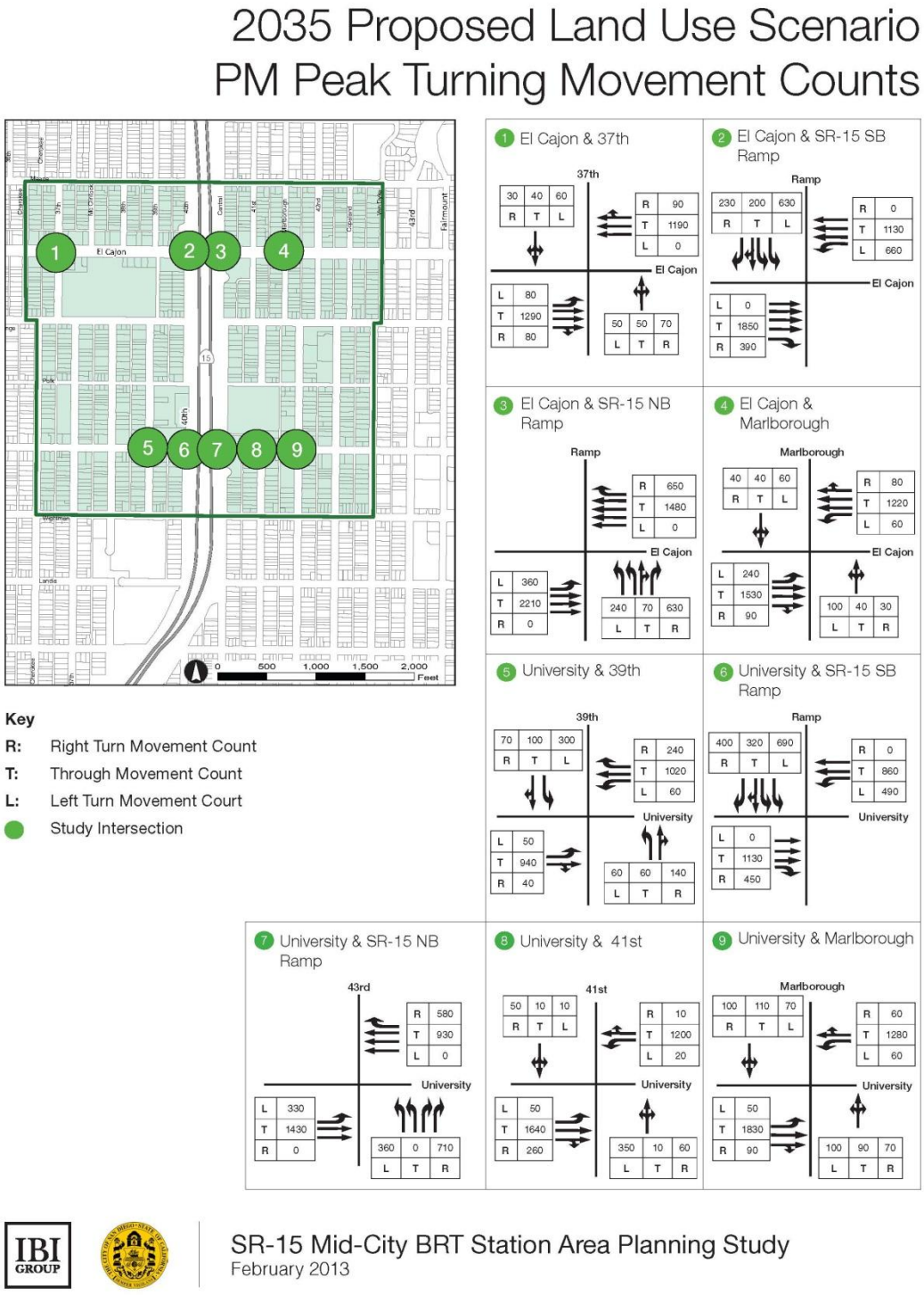


Figure 4 2035 Proposed Land Uses Scenario – PM Peak Hour Traffic Volumes



Traffic Recommendations

The 2035 Adopted Community Plan scenario showed that three out of the nine study intersections would operate at LOS E or F during the AM and/or PM peak hours. Four of the nine intersections are expected to operate at LOS E or F during either the AM and/or PM peak hour during 2035 conditions with the Proposed Land Uses. For both scenarios, there were no impacts or deficient street segments identified for 2035.

Adopted Community Plan Scenario

In order to bring the failing intersections to acceptable level of service D conditions, the following are recommended for the 2035 Adopted Community Plan scenario:

El Cajon Boulevard at SR-15 southbound ramp terminal (PM Peak, LOS E)

- The 65% draft plans for the station at El Cajon Boulevard at SR-15 do not include any modifications to the ramp terminal. Physical mitigation to improve this intersection would require adding an additional left-turn lane on the westbound approach to bring the overall intersection operations to LOS D. An additional westbound left-turn lane would require widening the bridge or removing the bus pull out lane or sidewalk. Given that the transit platform, sidewalk, and bus pull out lane are part of the new BRT station at SR-15, it is not deemed feasible to remove these facilities nor is widening the bridge. In addition, widening this intersection would also increase the pedestrian crossing distance and walk times to access the BRT transit stations which would conflict with the overall multimodal access improvements to the study area. Therefore, no traffic improvement recommendations are proposed for this intersection.

University Avenue at SR-15 northbound ramp terminal (AM Peak, LOS E)

- The 65% draft plans for the station at University Avenue at SR-15 do not include any modifications to the ramp terminal. Physical mitigation to improve this intersection would require adding an additional left-turn lane on the eastbound approach to bring the overall intersection operations to LOS D. An additional eastbound left-turn lane would require widening the bridge or removing the bus pull out lane or sidewalk. Given that the transit platform, sidewalk, and bus pull out lane are part of the new BRT station at SR-15, it is not deemed feasible to remove these facilities nor is widening the bridge. In addition, widening this intersection would also increase the pedestrian crossing distance and walk times to access the BRT transit stations which would conflict with the overall multimodal access improvements to the study area. Therefore, no traffic improvement recommendations are proposed for this intersection.

University Avenue at 41st Street (AM Peak, LOS E)

- Northbound – provide a dedicated left-turn lane (90 feet). This would result in the removal of some on-street unmarked parallel parking on 41st Street on the east side (approximately 40 feet or 2 parking spaces). These spaces are likely used by the Church of Nazarene located on the southeast corner of University Avenue and 41st Street. This facility also provides off-street parking in a lot directly behind the building.

- Implementation of these improvements would result in a reduction in delay by 14.6 seconds for the AM and 20 seconds for the PM.

Proposed Land Use Plan Scenario

In order to bring the failing intersections to acceptable level of service D conditions, the following are recommended for the 2035 Proposed Land Use Plan scenario:

El Cajon Boulevard at SR-15 southbound ramp terminal (PM Peak, LOS E)

- No traffic improvement recommendations are proposed for this intersection based on the same reasons identified for the 2035 Adopted Community Plan scenario.

University Avenue at SR-15 northbound ramp terminal (AM Peak, LOS E)

- No traffic improvement recommendations are proposed for this intersection based on the same reasons identified for the 2035 Adopted Community Plan scenario.

University Avenue at 41st Street (AM Peak, LOS F and PM Peak, LOS E)

- Northbound – provide a dedicated left-turn lane (90 feet). This would result in the removal of some on-street unmarked parallel parking on 41st Street on the east side (approximately 40 feet or 2 parking spaces). These spaces are likely used by the Church of Nazarene located on the southeast corner of University Avenue and 41st Street. This facility also provides off-street parking in a lot directly behind the building.

- Westbound – Currently, the westbound approach has one left-turn pocket and one thru lane with on-street parking. In order to improve traffic operations at this intersection, it is recommended to narrow the left-turn pocket and provide one thru lane and one shared thru-right turn lane. In order to provide the additional thru lane, the intersection striping would need to be changed to line up with the receiving lanes on University Avenue. This would also result in the removal of on-street unmarked parallel parking on University Avenue on the north side (approximately 110 feet or 5 parking spaces). These parking spaces are most likely utilized by the commercial building northeast of University Avenue and 41st Street. This facility also provides off-street parking in a lot directly behind the building.

- Implementation of these improvements would result in a reduction in delay by 79.3 seconds for the AM and 37.5 seconds for the PM.

University Avenue at Marlborough Avenue (PM Peak, LOS E)

- Northbound – provide a dedicated left-turn lane (90 feet). This would result in the removal of some on-street unmarked parallel parking on Marlborough Avenue on the east side (approximately 80 feet or 4 parking spaces). These spaces are likely used by the strip commercial businesses on the southeast corner of University Avenue and Marlborough Avenue. The shopping plaza facility has minimal off-street parking in a lot directly behind the building, but there are 10 diagonal parking spaces on the west side of the street directly across from the area proposed for parking removal and additional diagonal parking spaces on the block further south.

- Implementation of these improvements would result in a reduction in delay by 0.7 seconds for the AM and 7 seconds for the PM.

The Synchro files for the recommended mitigation measures can be found in Appendix G.

Transit

This section discusses the transit facility and service plans for the study area, how the proposed changes in land uses will interact with them, and how they can help mitigate impacts to future traffic conditions.

Transit Services and Facilities

The existing transit services and facilities were documented in the Mobility Analysis Existing Conditions Report, June 2011. The fixed route services in that report (Routes 1 and 15 on El Cajon Boulevard; Routes 7, 10, and 965 on University Avenue; and Routes 210 and 960 on SR-15) are all still in operation. Several significant transit improvements are included in the adopted 2050 Regional Transportation Plan for the study area, as summarized in Table 10.

Table 10 RTP Study Area Transit Improvements

Facility/Service	Improvement	Status
Local Transit Routes	Frequency improvement for Routes 7 and 956 routes in the University Avenue corridor. Also, extension of existing local routes 6 and 11 to the City Heights Transit Plaza with increased frequency.	Included in revenue constrained RTP network for implementation in 2035 decade.
Mid-City Rapid (Route 15)	Construction bids due 2/20/2013	Scheduled to be in operation in 2014-15.
SR-15 BRT	Addition of Routes 610 and 680 to existing Routes 210 and 960	Design of BRT lanes and stations underway now, scheduled for completion by end of 2013. Facility scheduled to open in late 2015/early 2016.
Route 10 Rapid	Conversion of existing Route 10 into rapid service	Included in revenue constrained RTP network for implementation in 2020 decade.
El Cajon Boulevard Trolley (Route 560) Phase 1	Conversion of Mid-City Rapid to LRT between Downtown and SR-15 with interim terminal at the Boulevard Transit Plaza.	Included in revenue constrained RTP network for implementation by 2035.
El Cajon Boulevard Trolley (Route 560) Phase 2	Extension of Route 560 LRT from SR-15 to SDSU	Included in revenue constrained RTP network for implementation by 2050.
SR-15 Trolley	LRT service between San Ysidro Station and UTC area (Route 562)	Included in revenue constrained RTP network for completion by 2050

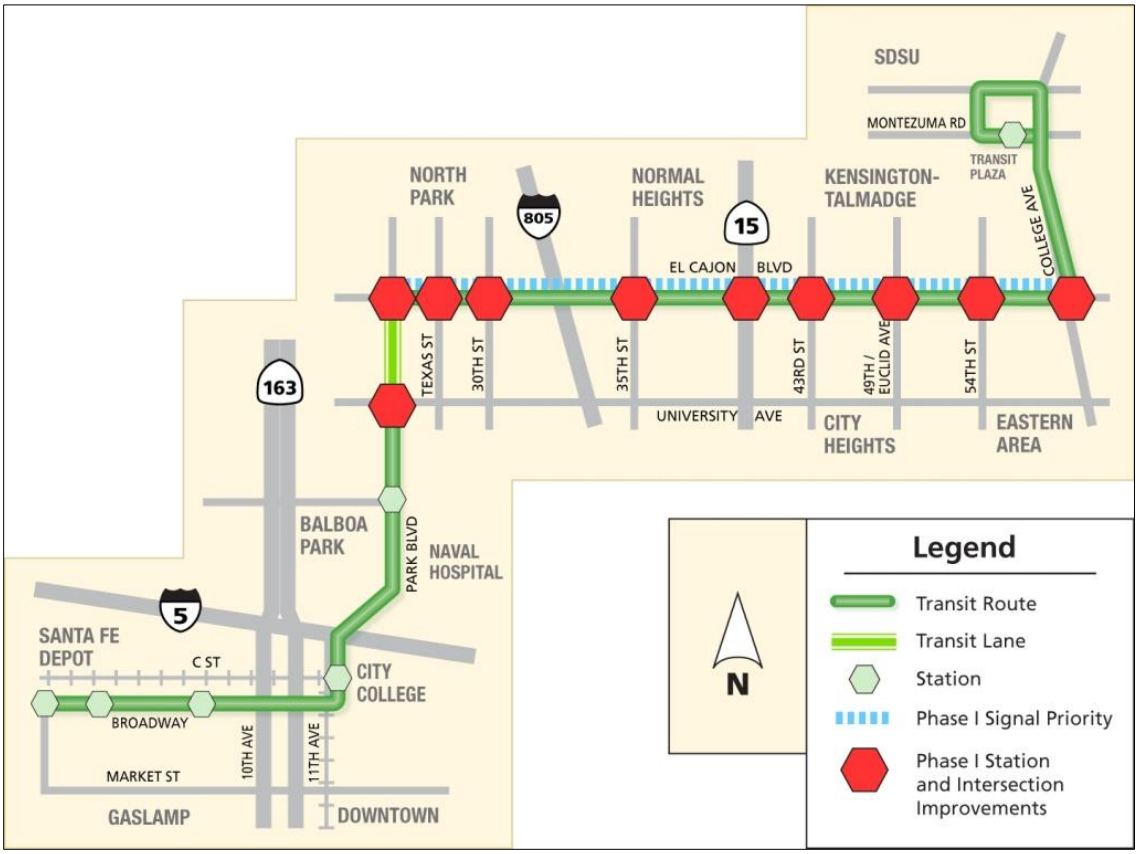
All of these improvements will help serve the travel demand generated by the proposed land uses, as described below.

Mid-City Rapid

This service will be a significant enhancement to the service currently provided by Routes 1 and 15. Connecting Downtown to San Diego State University with upgraded vehicles operating at higher speeds will enable convenient travel in the corridor for a wide range of trip purposes. As such, it has the potential to provide a high quality of transportation service for the proposed uses along El Cajon

Boulevard. As shown in Figure 5, stops in the study area will be provided at 35th Street and SR-15, with another stop just east of the study area at 43rd Street.

Figure 5 Mid-City Rapid Project



SR-15 BRT

This project will provide freeway level stations at El Cajon Boulevard and University Avenue (see Figures 6 and 7). The routes serving these stations will provide connections to regional destinations both north and south of Mid-City, greatly expanding the transit travel options for the Mid-City community.

Route 10 Rapid

This service will provide service levels similar to the Mid-City Rapid in connecting Mid-City with North Park, Hillcrest, Mission Hills, and the Pacific Highway corridor.

Longer Term Projects

The RTP include converting the Mid-City Rapid to Trolley service in phases. The first phase would extend as far as SR-15 by 2035. This project is included in the revenue constrained RTP. The revenue constrained program of projects also includes the extension of Trolley service to SDSU and the provision of Trolley service on SR-15 by 2050.

Figure 6 SR-15 BRT Project El Cajon Blvd Segment

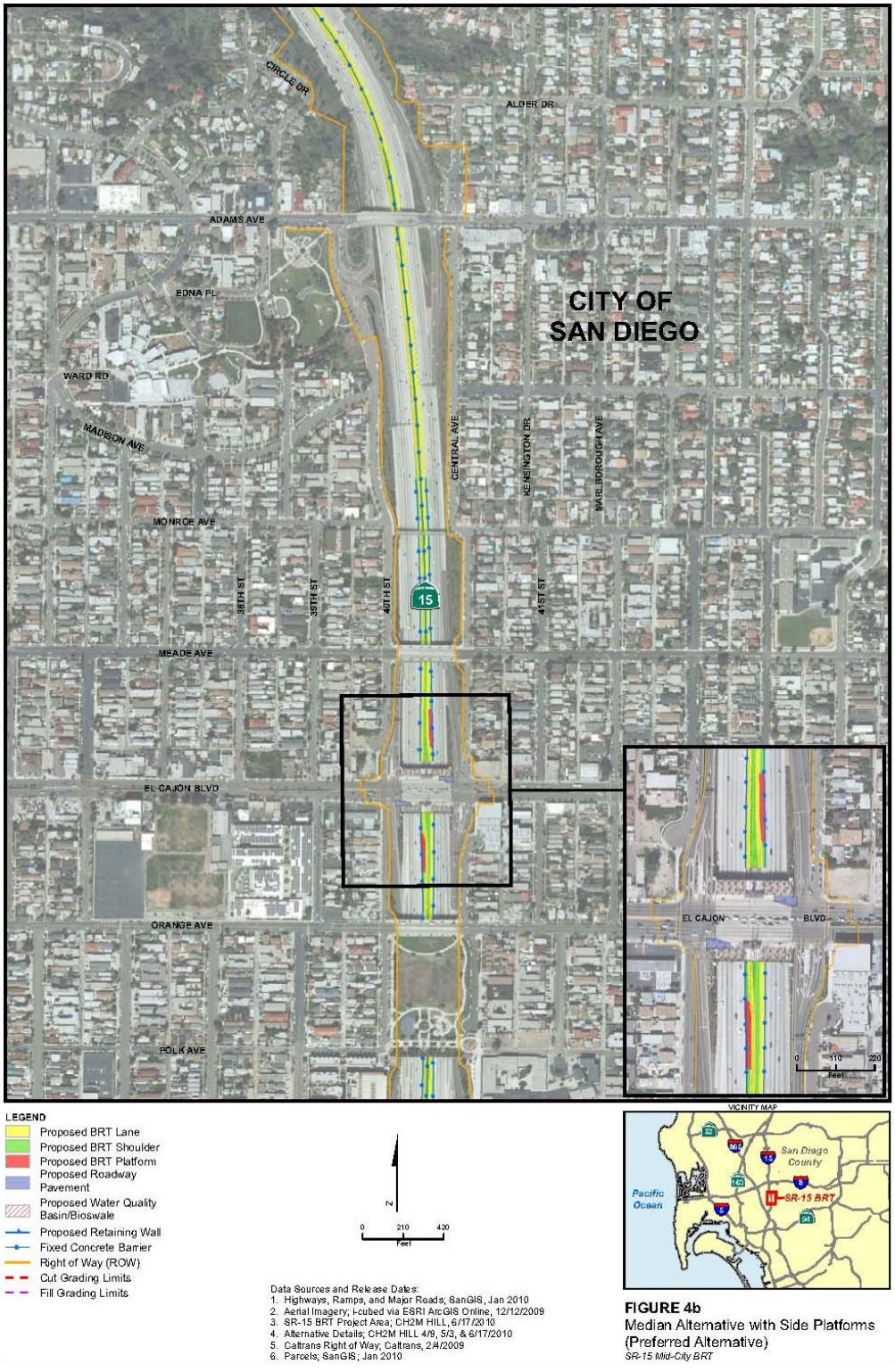


FIGURE 4b
Median Alternative with Side Platforms (Preferred Alternative)
SR-15 Mid-City BRT

Figure 7 SR-15 BRT Project University Ave Segment

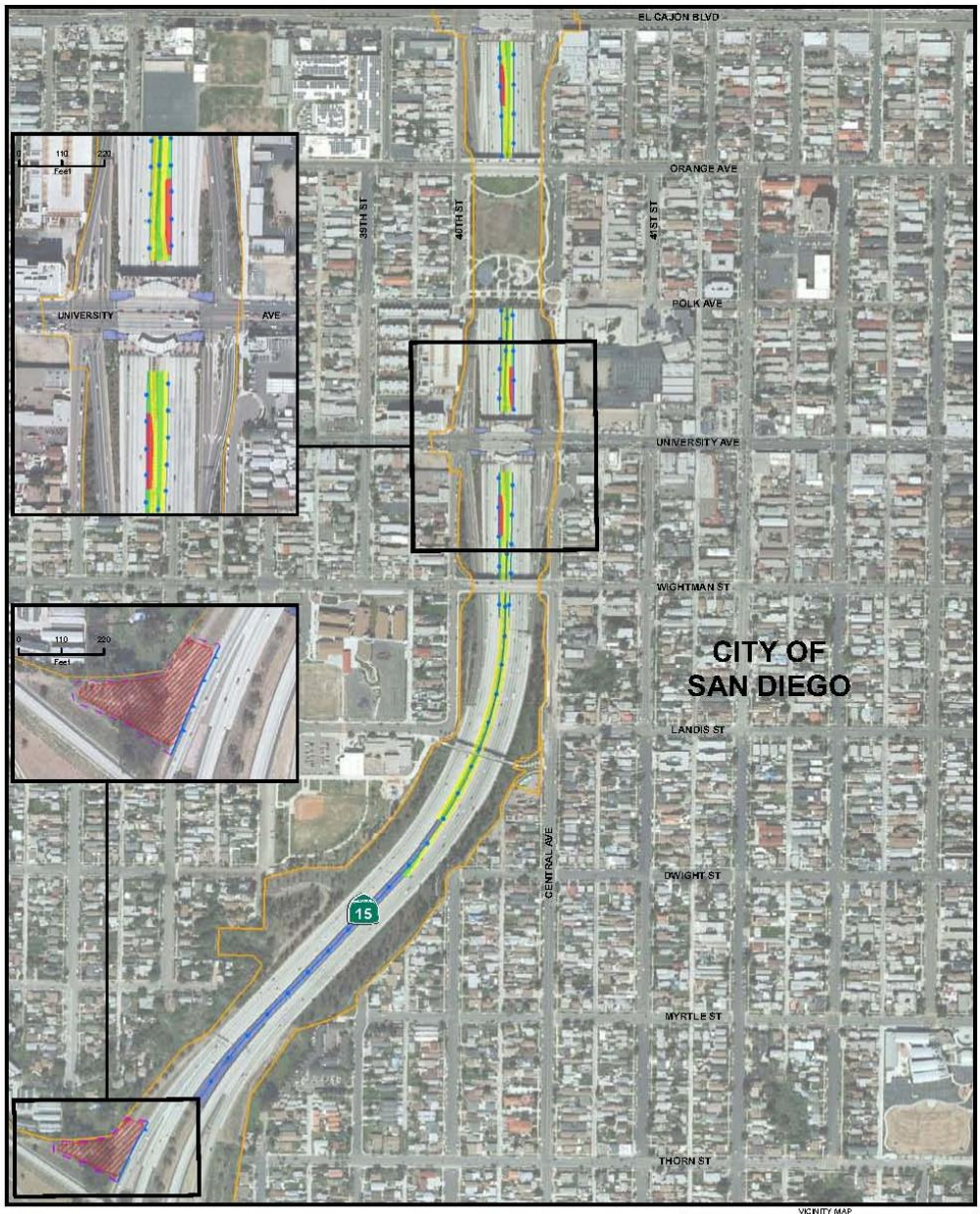


FIGURE 4a
Median Alternative with Side Platforms (Preferred Alternative)
SR-15 Mid-City BRT

Relationship of Transit Improvements to the Proposed Land Uses

The existing and improved transit services in the study area will provide numerous transit options for the travel demand resulting from the proposed land uses developed in this study. The wide range of destinations conveniently reachable and the high level of service frequency will facilitate a reduced reliance on automobile travel for people living and working along these corridors. The availability of transit for the proposed development areas is described below.

El Cajon Boulevard Corridor

The most intensive development is proposed at the SR-15 interchange. All four quadrants are proposed for development densities ranging from 50 to 60 dwelling units per acre. A rich mixture of transit opportunities will be available for east-west and north-south travel from the Boulevard Transit Plaza located on the bridge over SR-15.

- Routes 1 and 15, along with the Mid-City Rapid and ultimately Trolley service will provide frequent service to both nearby destinations along El Cajon Boulevard, as well as more distant locations such as Downtown, Hillcrest, SDSU, and La Mesa.

- Connections to Mission Valley are currently available through a transfer with Route 6 at Texas Street. In the future, access to Mission Valley will also be available through BRT connection to the Green Line at the Mission San Diego Station.

- Longer distance north-south travel on SR-15 is currently served by Route 210 which connects during the peak period to Downtown and Mira Mesa, and Route 960, with its peak period connections to Kearny Mesa and University City. In the future, Route 610 will provide connections to Escondido, the I-15 Corridor, the Green Line at Mission San Diego Station, and Downtown. Route 680 will provide connections to Otay Ranch, the Mission San Diego Green Line Station, and Sorrento Mesa.

Transit service for the development proposed for locations west and east of SR-15 is available now on Routes 1 and 15, with Mid-City Rapid and Trolley service in the future. In addition to starting or ending a trip in these areas, transfer opportunities will be available for residents of the study area at the Boulevard Transit Plaza for travel to more distant locations.

University Avenue Corridor

The northwest quadrant of the SR-15 interchange already has a higher density mixed use project in place. The other three quadrants are proposed for higher development levels ranging from 50 to 60 dwelling units per acre. The interchange area currently has a wide range of transit opportunities at the City Heights Transit Plaza located on the bridge over SR-15, with several enhancements to come in the future.

- Routes 7 and Route 10 currently provide frequent service along University Avenue with service to nearby destinations as well as more distant locations such as North Park, Hillcrest, Mission Hills, Pacific Highway, Old Town, and La Mesa.

- Route 965 circulator service connects this location with neighborhoods east and south, including Azalea Park, Fairmount Park, and Chollas Creek.

- Connections to Mission Valley are available through transfers with Route 6 at 30th Street.

- In the future, Route 10 is planned to be converted into a Rapid service. These enhancements, similar to the ones to be constructed for the Mid-City Rapid, will provide faster east-west travel times.

- Longer distance north-south travel on SR-15 is currently served by Route 210 which connects during the peak period to Downtown and Mira Mesa, and Route 960, with its peak period connections to Kearny Mesa and University City. In the future, Route 610 will provide connections to Escondido, the I-15 Corridor, the Green Line at Mission San Diego Station, and Downtown. Route 680 will provide connections to Otay Ranch, the Mission San Diego Green Line Station, and Sorrento Mesa.

Transit service for the development proposed for locations west and east of SR-15 is available today on Routes 7 and 10, with the Route 10 Rapid service in the future. In addition to starting or ending a trip in these areas, transfer opportunities will be available for residents of the study area at the City Heights Transit Plaza for travel to more distant locations.

Transit Supportive Improvement Projects

It is fortunate that all of the potential improvements to transit service in the study area are currently included in the RTP. Capital facilities, station amenities enhancements, and priority treatments are coming together in a way that will directly strengthen the attractiveness of transit service in the study area. Listed below are the key elements of these projects that will be implemented by SANDAG.

- The Mid-City Rapid project is in the construction bidding process at this time. In addition to the construction of new stations at 35th and 43rd Streets, the project includes the installation of fiber optic cable and traffic signal interconnect on El Cajon Boulevard between Park Boulevard and College Avenue. The provision of traffic signal priority will enhance both the speed of operation and the convenience of travel on the Mid-City Rapid.

- The two SR-15 BRT stations are currently in the design phase. These stations will provide convenient access to the BRT services on SR-15, along with improvements to the transit plazas on El Cajon Boulevard and University Avenue to enhance connections to the new stations and facilitate fare payment.

- Route 10 Rapid service on University Avenue can be expected to have elements similar to the Mid-City Rapid project, in terms of new stations and priority treatments. These enhancements will increase operating speed and make the service more convenient to use. The only stop for Route 10 stop in the study area is at the City Heights Transit Plaza, with nearby stops at 35th Street and Fairmount Avenue.

- The construction of the Trolley line along El Cajon Boulevard will be a substantial investment in transit infrastructure. Planned to be developed in phases, the first segment will terminate at the Boulevard Transit Plaza. As such it will greatly benefit developments proposed at the SR-15/El Cajon Boulevard interchange.

- The construction of the Trolley along SR-15 will enhance the BRT service on in the corridor and enhance travel opportunities by providing rail connections to destinations north and south of the community.

These projects will be completed by SANDAG. There are several other bus stops in the study area along El Cajon Boulevard and University Avenue outside of the transit plazas that are not part of the Rapid projects that could be improved as development takes place. Discussion of those stops is provided below.

- El Cajon Boulevard – 37th Street, 38th Street, Marlborough Avenue, and Copeland Avenue. Improvements to these stops should include widened sidewalks, enhanced shelters and benches using a community design theme (as available), trash cans, variable message signs, and bus pads. Details for the improvements proposed for each stop are included in Table 13.

- University Avenue – 37th Street, 39th Street, and Marlborough Avenue. Many of these stops already have consistent shelters, benches, and trash cans. Improvements could include widened sidewalks, bus pads, and variable message signs. Details for the improvements proposed for each stop are included in Table 13.

Improvements to Impacted Intersections

The traffic analysis identified intersections with LOS E or F under one or both of the land use scenarios. Each intersection was evaluated to determine the potential effect on transit operations, and the potential for transit to help mitigate their impact. The findings of that evaluation are provided in Table 11.

Pedestrian Facilities

Pedestrian Environment Overview

The City of San Diego's 2010 Pedestrian Master Plan (PMP) provides a great deal of detail on the existing pedestrian facilities in the study area. The document identifies four hierarchal categories of facilities designed to guide funding and improvement priorities – District Routes, Corridor Routes, Connector Routes, and Neighborhood Routes. El Cajon Boulevard and University Avenue are designated as Corridor Routes since they have sidewalks along roads that support moderate density business and shopping districts with moderate pedestrian levels. Meade Avenue, Orange Avenue, Wightman Street, as well as portions of Marlborough Street and Central Avenue, are Connector Routes which are defined as sidewalks along roads that support institutional, industrial or business complexes with limited lateral access and low pedestrian levels. All other routes are Neighborhood Routes.

The Mobility Analysis Existing Conditions Technical Memo (June 2011) reviewed the general conditions of the pedestrian walkways within the study area boundary. These sidewalks in most cases were generally ample and wide, with some exceptions, but they were frequently cracked. In some cases, the close proximity of buildings to the sidewalk and sidewalk widths that are too small for the volume of people reduced the quality of pedestrian movement.

In the PMP, the Mid-City City Heights area ranked fourth in priority among the 56 community planning areas. The locations of pedestrian improvement concepts were ranked in order from the highest to lowest score to support identification of high priority locations. Those intersection and corridor improvement locations scoring at least 12 out of 15 points were considered as high priority project locations. The PMP established 49 high priority intersections and 19 high priority corridors for the first seven community planning areas analyzed. Three intersections and three corridors in the SR-15 Station Area Planning study area were ranked as high priority, as shown in Table 12 with their ranking.

Table 11 Transit Improvements for Impacted Intersections

Intersection/Impact	Scenario	Transit Related Recommendations	Opportunities for Transit Operations Improvements
El Cajon Boulevard			
El Cajon Blvd @ SR-15 SB Ramp Terminal (PM Peak, LOS E)	Community Plan & Consultant Proposals	• Implementation of the Mid-City Rapid will reduce east-west transit travel times and could reduce the number of peak hour vehicles using this segment of El Cajon Boulevard. • Implementation of the BRT services on SR-15 would increase available transit options for travel to north city employment centers and could reduce the number of peak hour vehicles using this segment of El Cajon Boulevard.	• The traffic signal priority provided as part of the Mid-City Rapid project will enhance transit's operating speeds in the corridor.
Intersection/Impact	**Scenario**	**Transit Related Recommendations**	**Opportunities for Transit Operations Improvements**
University Avenue			
University Ave @ SR-15 NB Ramp Terminal (AM Peak, LOS E)	Community Plan & Consultant Proposals	• Implementation of Route 10 Rapid service will reduce east-west transit travel times and could reduce the number of peak hour vehicles using this segment of University Avenue. • Implementation of the BRT services on SR-15 would increase available transit options for travel to north city employment centers and could reduce the number of peak hour vehicles using this segment of University Avenue.	• The traffic signal priority provided as part of the Route 10 Rapid project will enhance transit's operating speeds in the corridor. • The block east of 41st Street currently has building faces close to the sidewalk resulting in limited right of way for adding lanes. Any new projects on either side of the street should be sufficiently set back to enable the provision of a transit bypass lane in the westbound direction. (This improvement is included in the Pedestrian recommendations also.)
University Ave @ 41st St (AM Peak, LOS E)	Community Plan		
University Ave @ 41st St (AM Peak, LOS F and PM Peak, LOS E)	Consultant Proposals		
University Ave @ Marlborough Ave (PM Peak, LOS E)	Consultant Proposals		

Table 12 Study Area Intersection & Corridor Priority Rankings

Priority Ranking	Facility Location
Intersections	
7	40th & El Cajon Boulevard
15	41st & University Avenue
16	Marlborough & University
Corridors	
6	University Avenue between Central and 40th
13	University Avenue between Lincoln & 40th
16	Orange Avenue between 40th and Central

In addition to the City of San Diego PMP, a community-based "walk audit" was conducted on the morning of Saturday, April 16, 2011 to assess the existing pedestrian facilities in the study area. Several weaknesses in the pedestrian network were identified during the walk audit. Some of the major deficiencies identified by the group included:

- Large width of the major streets encouraged speeding through the community
- Sidewalks too narrow and lack of tree grates on University Avenue (as opposed to University Avenue west of SR-15)

- Lack of pedestrian walkways between SR-15 SB ramp to University Avenue and the development next to the freeway right-of-way
- Better pedestrian definition needed at signalized crosswalks by adding painted striping

Recommended Improvements

The following sections describe recommended pedestrian improvements based on the land use proposal for the study area, future traffic conditions, and the City of San Diego Pedestrian Master Plan Technical Memorandum (Phases 2 & 3). The objectives of these improvements are to enhance the pedestrian walking environment within the community.

Curb Extensions

In order to reduce the crossing distance at some of the intersections in the corridor a curb extension or bulb-out should be added to each corner. A curb extension is a traffic calming measure used to extend the sidewalk, reducing the crossing distance and permitting pedestrians and approaching vehicle drivers to see each other when parked vehicles are blocking visibility. Also, curb bulb-outs at intersections may help to slow traffic by narrowing the street. Curb extensions and bulb-outs work particularly well on urban streets where there is limited turning traffic by buses and vehicles. The use and placement of curb extensions should be considered closely with the transit improvements planned for the study area. Specific locations are listed in Table 13.

Bulb-outs are also effective in delineating on street parking zones. Techniques that reduce pedestrian crossing distance and time also improve the timing at signalized intersections (without removing the signal phase for pedestrians). This improvement would require the creation of extended curbs as well as new striping. Curb extensions would be most useful at busy intersections near the new BRT stations and in proximity to high-density land uses on El Cajon Boulevard and University Avenue between 39th Street and Marlborough Avenue.

Improved ADA/Accessibility Treatments

Adding a second ADA-compliant curb ramp to each corner of a busy intersection can improve accessibility for pedestrians. An advantage of having two ramps at the corner is that the curb ramps can lead directly along the line of travel thereby guiding pedestrians into the crosswalk rather than into the middle of the intersection. These ramps also provide directional guidance to pedestrians with vision impairments. This improvement would necessitate the reconstruction of each curb affected. Additional curb ramps would likely be constructed at busy intersections near transit and high-density land uses on El Cajon Boulevard and University Avenue between 39th Street and Marlborough Avenue.

Four-Leg Crosswalk Intersections

The four intersections adjacent to SR-15 along El Cajon Boulevard and University Avenue currently have only three crosswalk legs to allow for turning movements without the need to yield for pedestrians. However, the addition of the fourth-leg crosswalk would significantly reduce the travel time for pedestrians transferring between buses and reduce the number of pedestrian crossing maneuvers. Although the addition of the fourth leg crosswalk would cause a slight additional traffic delay at the ramp terminals, it is essential to have full pedestrian accessibility at the busy intersections near the new BRT stations. This improvement would consist of new crosswalk striping and should include signs warning drivers to yield to pedestrians for the left-turn traffic exiting the off-ramp. These fourth leg crosswalks will be added as part of the SR-15 BRT project and were assumed to be in place in the 2035 intersection analysis.

Improve Walkway Aesthetics

In order to improve the pedestrian walking experience, the sidewalks on University Avenue could be widened and trees could be planted along the walkways. Since these types of pedestrian improvements have already been implemented on University Avenue west of SR-15, it would be beneficial to extend those features through the corridor. These improvements would require construction of new sidewalks, the planting of trees, and possibly restriping. The building setbacks might prevent widening for some portions. However, when redevelopment occurs, the opportunity to increase building setbacks and widen sidewalks should be considered.

Improve Pedestrian Definition at Crosswalks

Marked crosswalks guide pedestrians and alert drivers to a crossing location, so it is important that both drivers and pedestrians can clearly see the crossings. Crosswalk definition can be improved by enhanced striping to make them more visible to drivers. Also to ensure that the paint retains its contrast with the pavement, a longer lasting plastic or epoxy material embedded with reflective glass beads may be used. Although more expensive, longer-lasting crosswalk marking materials are a better value over time as they require less maintenance. This additional crosswalk striping would be most useful at busy intersections near the new BRT stations and in proximity to high-density land uses on El Cajon Boulevard and University Avenue between 39th Street and Marlborough Avenue.

Bicycle Facilities

Bicycle Facility Overview

According to the City of San Diego Bicycle Master Plan, 2011 (BMP), the Mid-City community has rather minimal bikeway facilities. One reason for the lack of facilities is the narrow curb-to-curb street widths that would require re-engineering to include bike lanes or to provide adequate room for bicycles in a wide curb lane. Most of the streets in this area also have curbside parking, which can be an obstacle to the implementation of bikeways. The project study area currently has a single Class II (bike lane) facility in Central Avenue right of way between University and Polk Avenues, in addition to a Class III (bike route) facility running the length of the corridor on Orange Avenue. In addition, sharrows have been deployed in the study area on El Cajon Boulevard.

Based on project fieldwork and observations from the Mobility Analysis Existing Conditions Technical Memo (June 2011), it is clear that the study area has relatively high levels of bicycle activity, due in part to its largely level terrain, presence of several schools, and the community's overall interest in cycling as a mode of transportation. Some of the challenges to bicycle usage in the study area are high levels of vehicular traffic, constrained lane widths, inconsistent paving and road maintenance, and the extensive use of on-street parallel parking, which creates a "door zone" hazard which can jeopardize cyclists when drivers unwittingly open their doors to exit their vehicles into the path of cyclists, and head-in diagonal parking, in which drivers leaving their parking space have difficulty seeing cyclists as they are backing out of their parking space.

The community-based "walk audit" conducted Saturday, April 16, 2011 assessed the bicycle facilities in the study area. Several bicycle facilities were noted in the community's bicycle network as deficient. These included:

- The need for separate bike lanes on the major streets through the community in order to promote more and better cycling opportunities.
- The lack of north-south bike connections between the SR-15 ramps and the adjacent developments on both sides of the freeway right-of-way.

Recommended Improvements

The following sections describe recommended bicycle improvements based on the City of San Diego Draft BMP (2011), the SANDAG 2050 Regional Transportation Plan, the Community Walk Audit, and an assessment based on the IBI Proposed Land Uses. These enhancements are being recommended with the goal of improving the bicycle network, access to the transit station, and promoting more cycling within and through the community.

Bicycle Parking

In areas where cyclists transfer to transit, such as the Boulevard and City Heights Transit Plazas, illegal chaining to trees, fences, railings, and other street furniture is common. To solve this issue more bike racks and other bicycle facilities such as shard bike stations and bike corrals should be provided near the new BRT stations at SR-15.

Bike Lanes

To promote more and better cycling opportunities, bike lanes should be provided on major streets in the community. Ideally these bike lanes would be separated from traffic on a path between the sidewalk/curb and parked cars. In the City of San Diego BMP several bike lanes improvements have been planned for Orange Avenue, El Cajon Boulevard, and University Avenue spanning through the entire study area. Further analysis will be needed upon redevelopment or implementation of corridor transit projects to determine the optimal approach to provide these facilities within the existing cross section and the ramifications of potentially losing a travel lane.

Bike Paths

Bike paths or trails that are located between land uses and large street blocks where there are no road connections provide improved accessibility and connectivity by allowing cyclists to take short-cuts. The segment of 40th Street from Polk Avenue to University Avenue next to the Metro Villas parking structure is a prime location for a bike path since it would connect the University Avenue & SR-15 SB Ramp intersection with Teralta Park. This type of improvement would require further study to determine feasibility and safety of any proposed bike paths. The City of San Diego BMP and the RTP include the I-15 Bikeway, which will run parallel to SR-15 on the east side in the study area and connect City Heights and Mission Valley.

Cul-de-Sac with Bicycle Boulevard

Several streets adjacent to the SR-15 end in a cul-de-sac in order to make space for the freeway ramps. This design allows for two-way traffic on the street as well as north and south access for cyclists. This type of roadway would be optimal for a bike boulevard due to its low-traffic, low-speed environment. One additional location which has been advocated for by the community for this type of improvement is Central Avenue between El Cajon Boulevard and Meade Avenue. The construction of a cul-de-sac in these conditions would require new signage, removal of parking, and other construction costs.

Improvement Summary

The improvements proposed to support the station area plan cover all four aspects of mobility in the study area. They include specific recommendations to support the plan proposals, as well as improvements planned by others for the area. Their locations are shown in Figure 8, with details provided in Table 13.

Figure 8 Mobility Improvement Locations

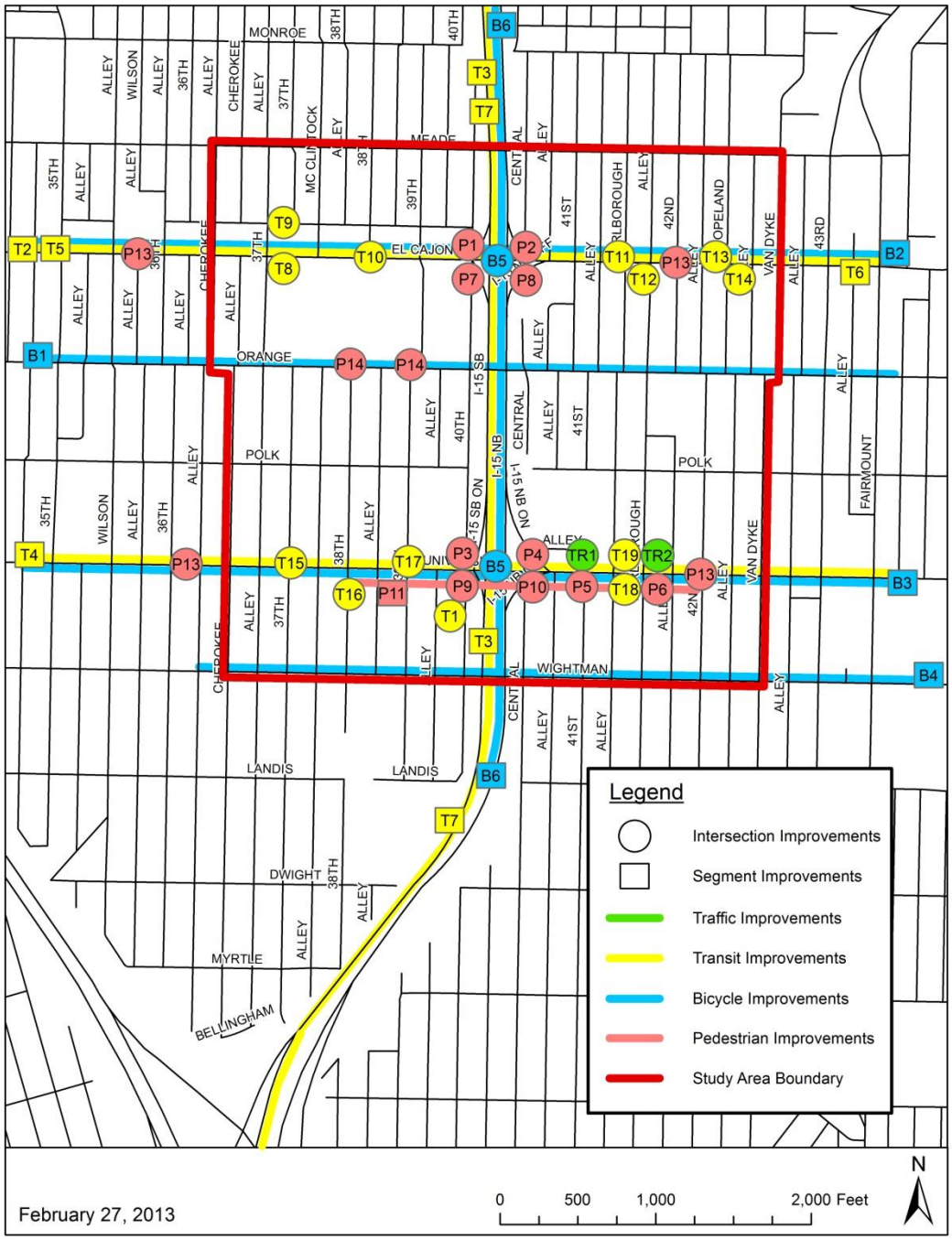


Table 13 Mobility Improvement Details

No.	Facility Location	Source	Description	Goals Supported[1]	Implementation Through Plan or Others	Status	Estimated Capital Cost
Traffic Improvements							
TR1	University Avenue at 41st Street	IBI Group	• Northbound – provide a dedicated left-turn lane (90 feet) which would require the removal of some on-street unmarked parallel parking (40 feet or 2 parking spaces) • Westbound –narrow the existing left-turn pocket and provide two thru lanes which would require new intersection striping and the removal of some on-street unmarked parallel parking (110 feet or 5 parking spaces)	C, T	Plan	New Recommendation	$1,200 – 3,000
TR2	University Avenue at Marlborough Avenue	IBI Group	• Northbound – provide a dedicated left-turn lane (90 feet) which would result in the removal of some on-street unmarked parallel parking (80 feet or 4 parking spaces)	C, T	Plan	New Recommendation	$1,200 – 3,000

No.	Facility Location	Source	Description	Goals Supported[1]	Implementation Through Plan or Others	Status	Estimated Capital Cost
Transit Improvements							
T1	Local Transit Routes	SANDAG 2050 RTP	• Increases in frequency to Routes 7 and 965 • Extension of Routes 6 and 11 to the City Heights Transit Plaza with increased frequency	T	Others (SANDAG, MTS)	Planning Phase	NA
T2	Mid-City Rapid (Route 15)	SANDAG 2050 RTP	• Station at Boulevard Transit Plaza • Installation of fiber optic cable and traffic signal interconnect on El Cajon Boulevard between Park Boulevard and College Avenue to provide traffic signal priority to enhance the speed of operation	T	Others (SANDAG)	Planning (Construction Bidding Process) Scheduled to be in Operation in 2014-15	$68 million
T3	SR-15 Bus Rapid Transit	SANDAG 2050 RTP	• New freeway level stations at Boulevard and City Heights Transit Plazas to provide access to the BRT services (existing routes 210 & 960, future routes 610 & 680 by 2018) on SR-15 • Improvements to the existing transit plazas to enhance connections to the new stations and facilitate fare payment	T	Others (SANDAG)	Design Phase	$35-40 million ($21.6 million budgeted in FY 13 OWP, additional funds being sought)

No.	Facility Location	Source	Description	Goals Supported[1]	Implementation Through Plan or Others	Status	Estimated Capital Cost
T4	Route 10 Rapid Service on University Avenue	SANDAG 2050 RTP	• Stop at City Heights Transit Plaza • Similar to the Mid-City Rapid project in terms of new stations and priority treatments to increase operating speed	T	Others (SANDAG)	Planning Phase	$85 million
T5	El Cajon Boulevard Trolley Line (Route 560) – Phase 1	SANDAG 2050 RTP	• First segment between Downtown and the Boulevard Transit Plaza by 2035	T	Others (SANDAG)	Planning Phase	$1.921 billion (Downtown to SDSU)
T6	El Cajon Boulevard Trolley Line (Route 560) – Phase 2	SANDAG 2050 RTP	• Second segment between Boulevard Transit Plaza and SDSU by 2050	T	Others (SANDAG)	Planning Phase	$1.921 billion (Downtown to SDSU)
T7	SR-15 Trolley Line (Route 562) -	SANDAG 2050 RTP	• New Trolley line between UTC and San Ysidro via Mid-City	T	Others (SANDAG)	Planning Phase	$2,548 billion
T8	El Cajon Boulevard at 37th Street Bus Stop Improvements – Westbound Nearside	IBI Group	• Enhanced shelters and benches using a community design theme • Trash cans • Variable message sign • Bus pad	T	Plan	New Recommendation	• $15,000 • $350 • $10,000 • $30,000
T9	El Cajon Boulevard at 37th Street Bus Stop Improvements – Eastbound Nearside	IBI Group	• Enhanced shelters and benches using a community design theme • Trash cans • Variable message signs • Bus pad	T	Plan	New Recommendation	• $15,000 • $350 • $10,000 • $30,000

No.	Facility Location	Source	Description	Goals Supported[1]	Implementation Through Plan or Others	Status	Estimated Capital Cost
T10	El Cajon Boulevard at 38th Street Bus Stop Improvements – Westbound Nearside	IBI Group	• Enhanced shelters and benches using a community design theme) • Trash cans • Variable message signs • Bus pad	T	Plan	New Recommendation	• $15,000 • $350 • $10,000 • $30,000
T11	El Cajon Boulevard at Marlborough Avenue Bus Stop Improvements – Westbound Farside	IBI Group	• Variable message signs • Bus pad	T	Plan	New Recommendation	• $10,000 • $30,000
T12	El Cajon Boulevard at Marlborough Avenue Bus Stop Improvements – Eastbound Farside	IBI Group	• Enhanced shelters and benches using a community design theme • Variable message sign • Bus pad	T	Plan	New Recommendation	• $15,000 • $10,000 • $30,000
T13	El Cajon Boulevard at Copeland Avenue Bus Stop Improvements – Westbound Farside	IBI Group	• Enhanced shelters and benches using a community design theme • Variable message signs • Bus pad	T	Plan	New Recommendation	• $15,000 • $10,000 • $30,000

No.	Facility Location	Source	Description	Goals Supported[1]	Implementation Through Plan or Others	Status	Estimated Capital Cost
T14	El Cajon Boulevard at Copeland Avenue Bus Stop Improvements – Eastbound Farside	IBI Group	• Enhanced shelters and benches using a community design theme • Variable message sign	T	Plan	New Recommendation	• 15,000 • 10,000
T15	University Avenue at 37th Street Bus Stop Improvements – Westbound Farside	IBI Group	• Variable message sign	T	Plan	New Recommendation	$10,000
T16	University Avenue at 38th Street Bus Stop Improvements – Eastbound Nearside	IBI Group	• Variable message sign • Bus pad	T	Plan	New Recommendation	• $10,000 • $30,000
T17	University Avenue at 39th Street Bus Stop Improvements – Westbound Farside	IBI Group	• Variable message sign	T	Plan	New Recommendation	$10,000

No.	Facility Location	Source	Description	Goals Supported[1]	Implementation Through Plan or Others	Status	Estimated Capital Cost
T18	University Avenue at Marlborough Avenue Bus Stop Improvements – Westbound Nearside	IBI Group	• Variable message sign	T	Plan	New Recommendation	$10,000
T19	University Avenue at Marlborough Avenue Bus Stop Improvements – Eastbound Farside	IBI Group	• Variable message sign	T	Plan	New Recommendation	$10,000
Pedestrian Improvements							
P1	El Cajon Boulevard at SR-15 SB Ramp Intersection Treatments	City of SD PMP (2010), IBI Group	• Incorporate accessible pedestrian signal (APS) • Addition of a second ADA-compliant curb ramp • Improve pedestrian definition at existing crosswalks – ladder style (see P7-10 re provision of fourth leg of crosswalk) • Add yield to pedestrian signage on SB off-ramp • Provide countdown pedestrian crossing heads	C, P, T	Others (SANDAG)	Design Phase	• $20,000 • $10,000 • $6,200 • $750

No.	Facility Location	Source	Description	Goals Supported[1]	Implementation Through Plan or Others	Status	Estimated Capital Cost
P2	El Cajon Boulevard at SR-15 NB Ramp Intersection Treatments	City of SD PMP (2010), IBI Group	• Incorporate accessible pedestrian signal (APS) • Addition of a second ADA-compliant curb ramp • Improve pedestrian definition at existing crosswalks – ladder style (see P7-10 re provision of fourth leg of crosswalk) • Add yield to pedestrian signage on NB off-ramp • Provide countdown pedestrian crossing heads	C, P, T	Others (SANDAG)	Design Phase	• $20,000 • $10,000 • $6,900 • $750
P3	University Avenue at SR-15 SB Ramp Intersection Treatments	City of SD PMP (2010), IBI Group	• Incorporate accessible pedestrian signal (APS) • Addition of a second ADA-compliant curb ramp • Improve pedestrian definition at crosswalks – ladder style (see P7-10 re provision of fourth leg of crosswalk) • Add yield to pedestrian signage on SB off-ramp • Provide countdown pedestrian crossing heads	C, P, T	Others (SANDAG)	Design Phase	• $20,000 • $10,000 • $6,000 • $750

No.	Facility Location	Source	Description	Goals Supported[1]	Implementation Through Plan or Others	Status	Estimated Capital Cost
P4	University Avenue at SR-15 NB Ramp Intersection Treatments	City of SD PMP (2010), IBI Group	• Incorporate accessible pedestrian signal (APS) • Addition of a second ADA-compliant curb ramp • Improve pedestrian definition at crosswalks – ladder style (see P7-10 re provision of fourth leg of crosswalk) • Add yield to pedestrian signage on NB off-ramp • Provide countdown pedestrian crossing heads	C, P, T	Others (SANDAG)	Design Phase	• $20,000 • $10,000 • $5,300 • $750
P5	University Avenue at 41st Street Intersection Treatments	City of SD PMP (2010), IBI Group	• Addition of a second ADA-compliant curb ramp • Improve pedestrian definition at crosswalks	C, P	Plan	New Recommendation	• $10,000 • $5,800
P6	University Avenue at Marlborough Avenue Intersection Treatments	City of SD PMP (2010), IBI Group	• Addition of a second ADA-compliant curb ramp • Improve pedestrian definition at crosswalks	C, P	Plan	New Recommendation	• $10,000 • $5,800
P7	El Cajon Boulevard at SR-15 SB Ramp Four-Leg Crosswalks	SR-15 BRT PSE, SANDAG	• Create fourth-leg intersection crosswalk	C, P, T	Others (SANDAG)	Design Phase	$2,700

No.	Facility Location	Source	Description	Goals Supported[1]	Implementation Through Plan or Others	Status	Estimated Capital Cost
P8	El Cajon Boulevard at SR-15 NB Ramp Four-Leg Crosswalks	SR-15 BRT PSE, SANDAG	• Create fourth-leg intersection crosswalk	C, P, T	Others (SANDAG)	Design Phase	$2,700
P9	University Avenue at SR-15 SB Ramp Four-Leg Crosswalks	SR-15 BRT PSE, SANDAG	• Create four-leg intersection crosswalk	C, P, T	Others (SANDAG)	Design Phase	$2,100
P10	University Avenue at SR-15 NB Ramp Four-Leg Crosswalks	SR-15 BRT PSE, SANDAG	• Create four-leg intersection crosswalk	C, P, T	Others (SANDAG)	Design Phase	$2,300
P11	University Avenue Sidewalk Enhancements east and west of SR-15	IBI Group	• Widen sidewalks and plant trees on University Avenue to maintain consistency through corridor on both sides of SR-15 upon redevelopment	C, P, T	Plan	New Recommendation	$240,000
P12	Central Avenue Cul de Sac	IBI Group	• Close Central Avenue intersection with El Cajon Boulevard while allowing pedestrians and bicycles to pass through	C, P, T	Plan	New Recommendation	$165,000 w/o right of way

No.	Facility Location	Source	Description	Goals Supported[1]	Implementation Through Plan or Others	Status	Estimated Capital Cost
P13	Sidewalk color continuation across alleys where they meet University and/or El Cajon Boulevard	IBI Group	• As redevelopment occurs and sidewalks are improved to colored or textured treatments, extend the same treatment through alley driveways on El Cajon Boulevard and University Avenue	P	Plan	New Recommendation	$1,000 5' sidewalk $2,000 10' sidewalk
P14	Crossing Improvements at 38th and 39th Streets & Orange Avenue	IBI Group	• Flashing warning signal actuated by pedestrian at 38th Street & Orange Avenue • New signal at 39th Street & Orange Avenue with additional crosswalk	P	Plan	• New Recommendation • City Signal List	• 50,000 • $275,000
Bicycle Improvements							
B1	Orange Avenue Bicycle Boulevard	City of SD, BMP (2011)	• Destination signage to provide bicyclists with direction, distance or estimated travel times • Warning signs to alert motorists and cyclists of road condition changes	B	Others	Planning Phase	• $5,300 • $3,000

No.	Facility Location	Source	Description	Goals Supported[1]	Implementation Through Plan or Others	Status	Estimated Capital Cost
B2	El Cajon Boulevard from Utah Street to 43rd Street[2]	City of SD BMP Project 11 (2011), SANDAG 2050 RTP	• Class II bicycle facility on El Cajon Boulevard from Utah Street to 43rd Street, Class III bicycle facility along 43rd Street from Meade Avenue to El Cajon Boulevard (nearly two miles long) • Roadway treatments include new signage, traffic striping, pavement markings, bicycle loop detector	B, C	Plan & Others	Planning Phase	$482,790
B3	University Avenue from Utah Street to Fairmount Avenue[2]	City of SD BMP Project 22 (2011), SANDAG 2050 RTP	• Class II bicycle facilities along University Avenue from Utah Street to Fairmount Avenue (nearly two miles long) • Roadway treatments include new signage, traffic striping, pavement markings, bicycle loop detector, removal of parking spaces	B, C	Plan & Others	Planning Phase	$465,183

No.	Facility Location	Source	Description	Goals Supported[1]	Implementation Through Plan or Others	Status	Estimated Capital Cost
B4	Wightman Street from Swift Avenue to Fairmount Avenue	City of SD BMP Project 30 (2011)	• Class II bicycle facilities along Wightman Street from Swift Avenue to Fairmount Avenue (approximately one mile). This closes a Class II gap between Swift Avenue and 35th Street • Connects residential neighborhoods to the existing Class II bicycle lanes along 35th Street and Swift Avenue • Roadway treatments include new signage, traffic striping, pavement markings, bicycle loop detector, removal of parking spaces	B, C	Others	Proposed	$257,638
B5	Bike Racks and Bike Stations near BRT Stations	IBI Group	• Additional bike racks near the new BRT stations at Boulevard and City Heights Transit Plazas (four five-bike racks) • Provide bike share stations at or near transit plazas • Provide bike corrals at or near transit plazas (four bike corrals)	B	Plan	New Recommendation	• $4,000 • Cost covered by vendor • $12,000

No.	Facility Location	Source	Description	Goals Supported[1]	Implementation Through Plan or Others	Status	Estimated Capital Cost
B6	Interstate 15 Bikeway	Caltrans PSR (2012) City of San Diego BMP	• Caltrans is leading the construction of this Class I bike path which will run parallel to SR-15 between Camino del Rio South in Mission Valley to Adams Avenue • The City is leading the extension of the path between Adams Avenue and Landis Street	B, C	Caltrans – Mission Valley to Adams Plan – Adams to Landis	• Mission Valley to Adams – Design • Adams to Landis – Planning	• Mission Valley to Adams – $9.2 million • Adams to Landis – TBD

1 Mobility Goals
C – Enhance community connectivity with transit plazas
P – Enhance pedestrian environment
B – Enhance bicycle environment
T – Expand transit use through enhanced facilities and service

2 The Plan supports the provision of Class II bicycle facilities in the El Cajon Boulevard and University Avenue corridors. These projects would enhance community connectivity and expand the availability of nonmotorized access to transit. Further analysis will be needed upon redevelopment or implementation of corridor transit projects to determine the optimal approach to provide these facilities within the existing cross section.

Concept Drawings

Drawings illustrating the types of mobility improvements and their locations recommended along El Cajon Boulevard and University Avenue are provided in Figures 9 and 10. These drawings show the pedestrian improvements at the BRT stations, the recommended improvements at bus stops, and the location in the right of way of bicycle lanes. These drawings are conceptual in nature and show examples of the kind of improvements that will be provided. The specific facilities will be refined during the design phase to ensure their fit and compatibility with the transportation facilities in the corridors.

Figure 9 El Cajon Boulevard Concept Drawings

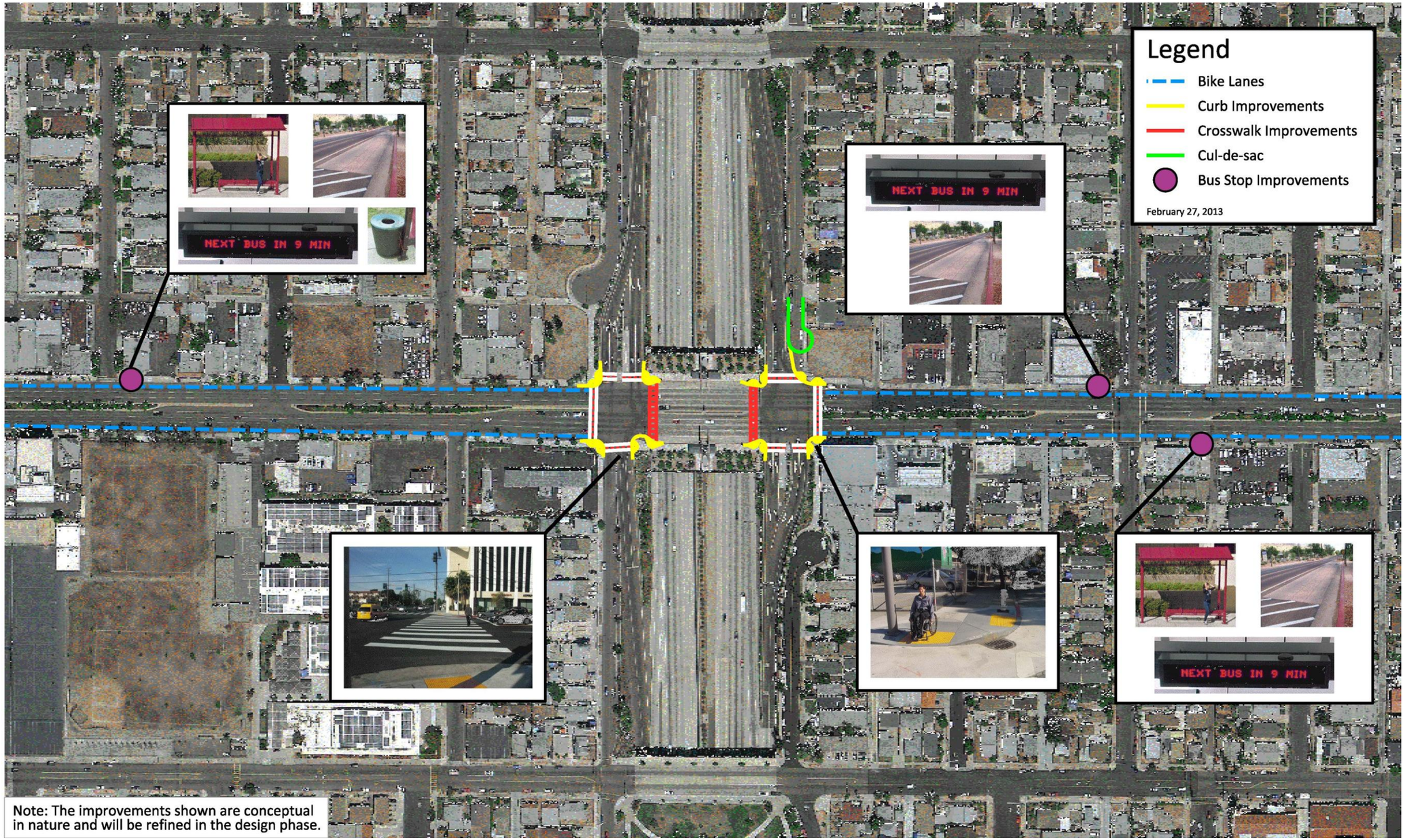
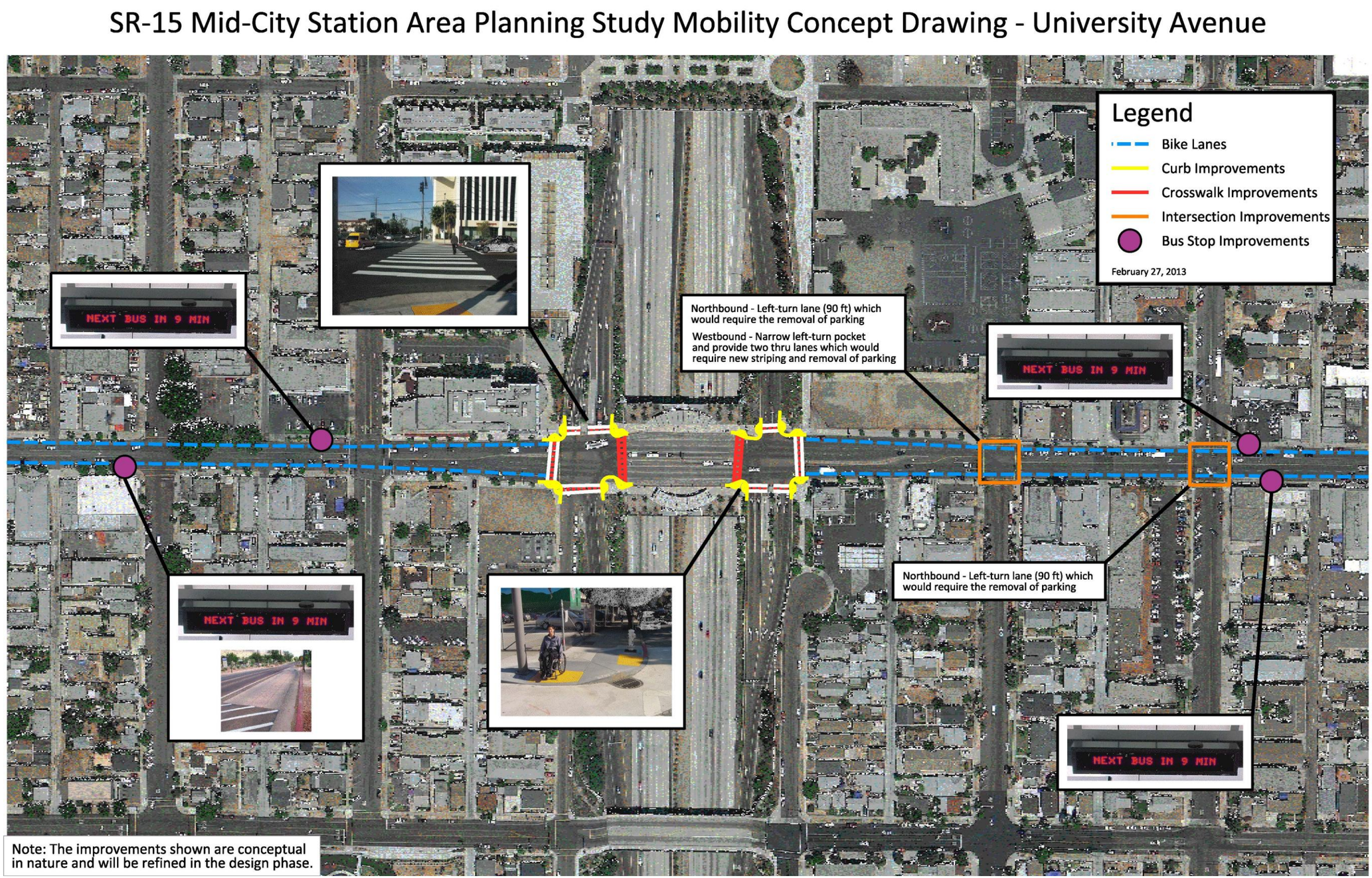


Figure 10 University Avenue Concept Drawings



Appendix A

Detailed Proposed Land Use and Trip Generation Tables

Existing Conditions (2008)

TAZ: 3232

LU Code	Land Use	Lot Area (acre)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached less or equal 20 DU/acre	10	-	124	-	9	/DU	1,116
1110	Single Family Detached over 20 DU/acre	1	-	21	-	9	/DU	189
1210	MF Residential less or equal 20 DU/acre	2	-	29	-	8	/DU	232
1220	MF Residential over 20 DU/acre	12	-	484	-	6	/DU	2,904
5006	Automobile Dealership	0	1,272	-	-	45	/ksf	57
5007	Arterial Commercial	2	47,732	-	-	40	/ksf	1,909
1190	Single Family Residential Without Units	0	-	-	-	-	-	-
4118	Road Right of Way	15	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	1	-	-	-	-	-	-
	Totals:	44	49,004	658	-	-	-	6,408

TAZ: 3233

LU Code	Land Use	Lot Area (acre)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached less or equal 20 DU/acre	7	-	84	-	9	/DU	756
1110	Single Family Detached over 20 DU/acre	0	-	10	-	9	/DU	90
1210	MF Residential less or equal 20 DU/acre	1	-	16	-	8	/DU	128
1220	MF Residential over 20 DU/acre	13	-	499	-	6	/DU	2,994
5007	Arterial Commercial	5	58,833	-	-	40	/ksf	2,353
4114	Parking Lot - Surface	0	-	-	-	-	-	-
4118	Road Right of Way	12	-	-	-	-	-	-
	Totals:	39	58,833	609	-	-	-	6,321

TAZ: 3261

LU Code	Land Use	Lot Area (acre)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached less or equal 20 DU/acre	5	-	52	-	9	/DU	468
1110	Single Family Detached over 20 DU/acre	0	-	5	-	9	/DU	45
1210	MF Residential less or equal 20 DU/acre	3	-	40	-	8	/DU	320
1220	MF Residential over 20 DU/acre	8	-	322	-	6	/DU	1,932
5006	Automobile Dealership	4	156,829	-	-	45	/ksf	7,057
5007	Arterial Commercial	2	40,895	-	-	40	/ksf	1,636
6002	Office (Low-Rise - less or equal to 100,000 SF)	1	15,261	-	-	Ln Formula	-	408
6102	Religious Facility (without day care)	1	10,148	-	-	5	/ksf	51
1190	Single Family Residential Without Units	0	-	-	-	-	-	-
4112	Freeway	4	-	-	-	-	-	-
4114	Parking Lot - Surface	0	-	-	-	-	-	-
4118	Road Right of Way	14	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	0	-	-	-	-	-	-
	Totals:	42	223,133	419	-	-	-	11,916

TAZ: 3285

LU Code	Land Use	Lot Area (acre)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached less or equal 20 DU/acre	4	-	42	-	9	/DU	378
1110	Single Family Detached over 20 DU/acre	0	-	3	-	9	/DU	27
1210	MF Residential less or equal 20 DU/acre	1	-	24	-	8	/DU	192
1220	MF Residential over 20 DU/acre	8	-	305	-	6	/DU	1,830
5006	Automobile Dealership	0	1,445	-	-	45	/ksf	65
5007	Arterial Commercial	4	113,080	-	-	40	/ksf	4,523
5009	Other Retail Trade and Strip Commercial	0	2,216	2	-	36	/ksf	80
6805	Junior High School or Middle School	12	152,393	-	587	1	/student	822
4112	Freeway	4	-	-	-	-		-
4114	Parking Lot - Surface	1	-	-	-	-		-
4118	Road Right of Way	12	-	-	-	-		-
9101	Vacant and Undeveloped Land	0	-	-	-	-		-
	Totals:	46	269,134	376	587	-		7,917

TAZ: 3286

LU Code	Land Use	Lot Area (acre)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached less or equal 20 DU/acre	9	-	105	-	9	/DU	945
1110	Single Family Detached over 20 DU/acre	0	-	13	-	9	/DU	117
1210	MF Residential less or equal 20 DU/acre	3	-	53	-	8	/DU	424
1220	MF Residential over 20 DU/acre	21	-	1,015	-	6	/DU	6,090
2103	Light Industry - General	0	2,400	1	-	15	/ksf	36
5006	Automobile Dealership	2	83,032	-	-	45	/ksf	3,736
5007	Arterial Commercial	4	141,271	3	-	40	/ksf	5,651
6002	Office (Low-Rise - less or equal to 100,000 SF)	0	8,740	-	-	Ln Formula	-	267
6102	Religious Facility (without day care)	1	26,987	-	-	5	/ksf	135
6509	Other Health Care	0	8,445	-	-	50	/ksf	422
6806	Elementary School	1	24,033	-	181	3	/student	525
7601	Park - Active	0	-	-	-	50	/ac	8
4112	Freeway	4	-	-	-	-	-	-
4114	Parking Lot - Surface	2	-	-	-	-	-	-
4118	Road Right of Way	28	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	0	-	-	-	-	-	-
	Totals:	78	294,908	1,190	181	-	-	18,357

TAZ: 3302

LU Code	Land Use	Lot Area (acre)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached less or equal 20 DU/acre	9	-	116	-	9	/DU	1,044
1110	Single Family Detached over 20 DU/acre	1	-	17	-	9	/DU	153
1210	MF Residential less or equal 20 DU/acre	6	-	100	-	8	/DU	800
1220	MF Residential over 20 DU/acre	24	-	1,128	-	6	/DU	6,768
5007	Arterial Commercial	4	73,273	4	-	40	/ksf	2,931
5009	Other Retail Trade and Strip Commercial	0	4,995	-	-	36	/ksf	180
6002	Office (Low-Rise - less or equal to 100,000 SF)	1	98,468	-	-	Ln Formula	-	1,669
6102	Religious Facility (without day care)	0	6,076	-	-	5	/ksf	30
6806	Elementary School	5	69,436	-	690	3	/student	2,001
1290	Multi-Family Residential Without Units	0	-	-	-	-	-	-
4113	Communications and Utilities	2	52,908	-	-	-	-	-
4114	Parking Lot - Surface	0	-	-	-	-	-	-
4115	Parking Lot - Structure	1	-	-	-	-	-	-
4118	Road Right of Way	21	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	0	-	-	-	-	-	-
	Totals:	75	305,156	1,365	690	-	-	15,576

TAZ: 3334

LU Code	Land Use	Lot Area (acre)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached less or equal 20 DU/acre	2	-	21	-	9	/DU	189
1110	Single Family Detached over 20 DU/acre	0	-	5	-	9	/DU	45
1210	MF Residential less or equal 20 DU/acre	1	-	15	-	8	/DU	120
1220	MF Residential over 20 DU/acre	8	-	493	-	6	/DU	2,958
5004	Neighborhood Shopping Center (30,000 SF or more)	2	-	-	-	720	/ac	1,288
5007	Arterial Commercial	3	92,896	3	-	40	/ksf	3,716
5009	Other Retail Trade and Strip Commercial	1	29,632	3	-	36	/ksf	1,067
6806	Elementary School	6	61,842	-	777	3	/student	2,253
7601	Park - Active	1	-	-	-	50	/ac	47
4112	Freeway	4	-	-	-	-	-	-
4114	Parking Lot - Surface	1	-	-	-	-	-	-
4118	Road Right of Way	12	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	1	-	-	-	-	-	-
	Totals:	41	184,370	540	777	-	-	11,684

TAZ: 3363

LU Code	Land Use	Lot Area (acre)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached less or equal 20 DU/acre	22	-	207	-	9	/DU	1,863
1110	Single Family Detached over 20 DU/acre	1	-	30	-	9	/DU	270
1210	MF Residential less or equal 20 DU/acre	5	-	76	-	8	/DU	608
1220	MF Residential over 20 DU/acre	8	-	320	-	6	/DU	1,920
5006	Automobile Dealership	0	10,131	-	-	45	/ksf	456
5007	Arterial Commercial	2	54,494	4	-	40	/ksf	2,180
5009	Other Retail Trade and Strip Commercial	0	5,666	-	-	36	/ksf	204
6102	Religious Facility (without day care)	1	26,416	-	-	5	/ksf	132
6806	Elementary School	7	42,333	-	577	3	/student	1,673
7601	Park - Active	13	-	-	-	50	/ac	626
7603	Open Space Park or Preserve	2	-	-	-	5	/ac	10
1190	Single Family Residential Without Units	0	-	-	-	-	-	-
1290	Multi-Family Residential Without Units	0	-	-	-	-	-	-
4114	Parking Lot - Surface	0	-	-	-	-	-	-
4118	Road Right of Way	21	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	1	-	-	-	-	-	-
	Totals:	84	139,040	637	577	-	-	9,942

TAZ: 3369

LU Code	Land Use	Lot Area (acre)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached less or equal 20 DU/acre	3	-	36	-	9	/DU	324
1110	Single Family Detached over 20 DU/acre	0	-	1	-	9	/DU	9
1210	MF Residential less or equal 20 DU/acre	2	-	28	-	8	/DU	224
1220	MF Residential over 20 DU/acre	10	-	462	-	6	/DU	2,772
5007	Arterial Commercial	4	96,091	-	-	40	/ksf	3,844
6001	Office (High-Rise - greater than 100,000 SF)	1	487,770	-	-	Ln Formula	-	5,594
6102	Religious Facility (without day care)	0	17,608	-	-	5	/ksf	88
6104	Post Office	0	6,500	-	-	168	/ksf	1,092
4112	Freeway	1	-	-	-	-	-	-
4114	Parking Lot - Surface	1	-	-	-	-	-	-
4118	Road Right of Way	13	-	-	-	-	-	-
	Totals:	37	607,969	527	-	-	-	13,947

	Lot Area (acre)	Floor Area (sf)	DU's	Number Students	Rate	Units	Trips
Total For Existing:	**485.3**	**2,131,547**	**6,320**	**2,812**	**-**	**-**	**102,068**

Adopted Community Plan (2035)

Legend:

For the Commercial/Mixed Use Land Uses, there are two rates that are applied in order to account for the commercial and residential trips generated:

Commercial Trips Generated = (Lot Area sf) x (0.04 Trips/sf) x (0.25 FAR)

Residential Trips Generated = (DU's) x (6 Trips/DU)

TAZ: 3232

LU Code	Land Use	Lot Area (ac)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	10.4	-	124	-	9	/DU	1,116
1110	Single Family Detached (20+ du/ac)	0.9	-	21	-	9	/DU	189
1210	MF Residential (≤ 20 du/ac)	2.0	-	29	-	8	/DU	232
1220	MF Residential (20+ du/ac)	11.8	-	484	-	6	/DU	2,904
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	132	-	6	/DU	792
5007	Arterial Commercial (20+ du/ac) - Commercial	1.8	19,800	-	-	40	/ksf	792
5007	Arterial Commercial	1.2	32,855	-	-	40	/ksf	1,314
1190	Single Family Residential Without Units	0.04	-	-	-	-	-	-
4118	Road Right of Way	15.0	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	0.8	-	-	-	-	-	-
	Totals:	44.0	52,655	790	-	-	-	7,339

TAZ: 3233

LU Code	Land Use	Lot Area (ac)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	6.8	-	81	-	9	/DU	729
1110	Single Family Detached (20+ du/ac)	0.4	-	8	-	9	/DU	72
1210	MF Residential (≤ 20 du/ac)	1.2	-	18	-	8	/DU	144
1220	MF Residential (20+ du/ac)	13.3	-	501	-	6	/DU	3,006
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	171	-	6	/DU	1,026
5007	Arterial Commercial (20+ du/ac) - Commercial	3.9	41,937	-	-	40	/ksf	1,677
5007	Arterial Commercial	0.8	19,044	-	-	40	/ksf	762
4118	Road Right of Way	12.3	-	-	-	-	-	-
		38.7	60,981	779	-	-	-	7,416

TAZ: 3261

LU Code	Land Use	Lot Area (ac)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	4.3	-	45	-	9	/DU	405
1110	Single Family Detached (20+ du/ac)	0.0	-	1	-	9	/DU	9
1210	MF Residential (≤ 20 du/ac)	2.8	-	44	-	8	/DU	352
1220	MF Residential (20+ du/ac)	7.7	-	313	-	6	/DU	1,878
5007	Arterial Commercial (≤ 20 du/ac) - Residential	-	-	2	-	6	/DU	12
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	172	-	6	/DU	1,032
5007	Arterial Commercial (≤ 20 du/ac) - Commercial	0.1	1,211	-	-	40	/ksf	48
5007	Arterial Commercial (20+ du/ac) - Commercial	2.8	24,595	-	-	40	/ksf	984
5007	Arterial Commercial	1.3	34,229	-	-	40	/ksf	1,369
5006	Automobile Dealership	0.3	10,774	-	-	45	/ksf	485
6102	Religious Facility (without day care)	0.6	10,148	-	-	5	/ksf	51
7214	Racquetball/Tennis/Health Club	3.5	55,000	-	-	40	/ksf	2,200
1190	Single Family Residential Without Units	0.03	-	-	-	-	-	-
4112	Freeway	3.7	-	-	-	-	-	-
4114	Parking Lot - Surface	0.4	-	-	-	-	-	-
4118	Road Right of Way	13.7	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	0.3	-	-	-	-	-	-
		41.6	135,957	577	-	-	-	8,825

TAZ: 3285

LU Code	Land Use	Lot Area (ac)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	3.8	-	42	-	9	/DU	378
1110	Single Family Detached (20+ du/ac)	0.05	-	1	-	9	/DU	9
1210	MF Residential (≤ 20 du/ac)	1.4	-	24	-	8	/DU	192
1220	MF Residential (20+ du/ac)	7.7	-	307	-	6	/DU	1,842
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	129	-	6	/DU	774
5009	Other Retail Trade and Strip Commercial (≤ 20 du/ac) - Residential	-	-	2	-	8	/DU	16
5007	Arterial Commercial (20+ du/ac) - Commercial	2.6	27,805	-	-	40	/ksf	1,112
5009	Other Retail Trade and Strip Commercial (≤ 20 du/ac) - Commercial	0.2	1,592	-	-	36	/ksf	57
5006	Automobile Dealership	0.3	1,445	-	-	45	/ksf	65
5007	Arterial Commercial	1.9	88,194	-	-	40	/ksf	3,528
5009	Other Retail Trade and Strip Commercial	0.1	624	-	-	36	/ksf	22
6805	Junior High School or Middle School	11.6	-	-	1,800	1.4	/Student	2,520
4112	Freeway	3.74	-	-	-	-	-	-
4114	Parking Lot - Surface	0.4	-	-	-	-	-	-
4118	Road Right of Way	11.6	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	0.3	-	-	-	-	-	-
		45.8	119,660	505	1,800	-	-	10,516

TAZ: 3286

LU Code	Land Use	Lot Area (ac)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	9.0	-	99	-	9	/DU	891
1110	Single Family Detached (20+ du/ac)	0.3	-	9	-	9	/DU	81
1210	MF Residential (≤ 20 du/ac)	3.8	-	59	-	8	/DU	472
1220	MF Residential (20+ du/ac)	21.3	-	1019	-	6	/DU	6,114
5007	Arterial Commercial (≤ 20 du/ac) - Residential	-	-	2	-	8	/DU	16
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	174	-	6	/DU	1,044
5007	Arterial Commercial (≤ 20 du/ac) - Commercial	0.3	10,057	-	-	40	/ksf	402
5007	Arterial Commercial (20+ du/ac) - Commercial	2.6	28,806	-	-	40	/ksf	1,152
5006	Automobile Dealership	1.4	81,832	-	-	45	/ksf	3,682
5007	Arterial Commercial	2.4	115,521	-	-	40	/ksf	4,621
6002	Office (Low-Rise - less or equal to 100,000 SF)	0.3	8,740	-	-	formula	-	267
6102	Religious Facility (without day care)	1.3	26,987	-	-	5	/ksf	135
6509	Other Health Care	0.5	8,445	-	-	50	/ksf	422
6806	Elementary School	1.5	-	-	199	2.9	/Student	577
7601	Park - Active	0.2	-	-	-	50	/acre	8
4112	Freeway	4.0	-	-	-	-	-	-
4114	Parking Lot - Surface	1.3	-	-	-	-	-	-
4118	Road Right of Way	28.0	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	0.3	-	-	-	-	-	-
		78.4	280,388	1,362	199	-	-	19,886

TAZ: 3302

LU Code	Land Use	Lot Area (ac)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	8.9	-	108	-	9	/DU	972
1110	Single Family Detached (20+ du/ac)	0.7	-	15	-	9	/DU	135
1210	MF Residential (≤ 20 du/ac)	6.6	-	108	-	8	/DU	864
1220	MF Residential (20+ du/ac)	24.5	-	1130	-	6	/DU	6,780
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	46	-	6	/DU	276
5007	Arterial Commercial (20+ du/ac) - Commercial	1.6	17,793	-	-	40	/ksf	712
5007	Arterial Commercial	2.1	44,313	-	-	40	/ksf	1,773
6002	Office (Low-Rise - less or equal to 100,000 SF)	1.2	98,468	-	-	formula	-	1,669
6102	Religious Facility (without day care)	0.2	6,076	-	-	5	/ksf	30
6806	Elementary School	4.6	-	-	690	2.9	/Student	2,001
1290	Multi-Family Residential Without Units	0.1	-	-	-	-	-	-
4113	Communications and Utilities	1.9	-	-	-	-	-	-
4114	Parking Lot - Surface	0.2	-	-	-	-	-	-
4115	Parking Lot - Structure	1.1	-	-	-	-	-	-
4118	Road Right of Way	21.2	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	0.5	-	-	-	-	-	-
		75.2	166,650	1,407	690	-	-	15,211

TAZ: 3334

LU Code	Land Use	Lot Area (ac)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	1.6	-	19	-	9	/DU	171
1110	Single Family Detached (20+ du/ac)	0.1	-	3	-	9	/DU	27
1210	MF Residential (≤ 20 du/ac)	1.0	-	17	-	8	/DU	136
1220	MF Residential (20+ du/ac)	7.8	-	495	-	6	/DU	2,970
5007	Arterial Commercial (≤ 20 du/ac) - Residential	-	-	1	-	8	/DU	8
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	191	-	6	/DU	1,146
5009	Other Retail Trade and Strip Commercial (≤ 20 du/ac) - Residential	-	-	2	-	8	/DU	16
5007	Arterial Commercial (≤ 20 du/ac) - Commercial	0.2	7,702	-	-	40	/ksf	308
5007	Arterial Commercial (20+ du/ac) - Commercial	4.0	53,648	-	-	40	/ksf	2,146
5009	Other Retail Trade and Strip Commercial (≤ 20 du/ac) - Commercial	0.3	1,012	-	-	36	/ksf	36
5007	Arterial Commercial	2.0	64,174	-	-	40	/ksf	2,567
5009	Other Retail Trade and Strip Commercial	0.4	21,798	-	-	36	/ksf	785
6007	Medical Office (less or equal to 100,000 SF)	0.5	39,400	-	-	50	/ksf	1,970
6806	Elementary School	5.6	-	-	1000	2.9	/Student	2,900
7600	Parks	0.1	-	-	-	50	/acre	6
7601	Park - Active	0.9	-	-	-	50	/acre	47
4112	Freeway	4.5	-	-	-	-	-	-
4118	Road Right of Way	11.5	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	0.1	-	-	-	-	-	-
		40.6	187,734	728	1,000	-	-	15,240

TAZ: 3363

LU Code	Land Use	Lot Area (ac)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	13.1	-	124	-	9	/DU	1,116
1110	Single Family Detached (20+ du/ac)	0.5	-	12	-	9	/DU	108
1210	MF Residential (≤ 20 du/ac)	10.5	-	148	-	8	/DU	1,184
1220	MF Residential (20+ du/ac)	8.7	-	338	-	6	/DU	2,028
5007	Arterial Commercial (≤ 20 du/ac) - Residential	-	-	46	-	8	/DU	368
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	23	-	6	/DU	138
5007	Arterial Commercial (≤ 20 du/ac) - Commercial	4.2	46,215	-	-	40	/ksf	1,849
5007	Arterial Commercial (20+ du/ac) - Commercial	0.5	6,566	-	-	40	/ksf	263
5006	Automobile Dealership	0.5	10,131	-	-	45	/ksf	456
5007	Arterial Commercial	1.9	52,514	-	-	40	/ksf	2,101
5009	Other Retail Trade and Strip Commercial	0.3	5,666	-	-	36	/ksf	204
6102	Religious Facility (without day care)	1.1	26,416	-	-	5	/ksf	132
6806	Elementary School	7.0	-	-	630	2.9	/Student	1,827
7601	Park - Active	11.8	-	-	-	50	/acre	591
7603	Open Space Park or Preserve	2.0	-	-	-	5	/acre	10
1190	Single Family Residential Without Units	0.04	-	-	-	-	-	-
4114	Parking Lot - Surface	0.2	-	-	-	-	-	-
4118	Road Right of Way	21.2	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	0.3	-	-	-	-	-	-
		83.9	147,508	691	630	-	-	12,373

TAZ: 3369

LU Code	Land Use	Lot Area (ac)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	3.3	-	36	-	9	/DU	324
1110	Single Family Detached (20+ du/ac)	0.02	-	1	-	9	/DU	9
1210	MF Residential (≤ 20 du/ac)	2.1	-	28	-	8	/DU	224
1220	MF Residential (20+ du/ac)	9.7	-	462	-	6	/DU	2,772
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	117	-	6	/DU	702
5007	Arterial Commercial (20+ du/ac) - Commercial	3.2	35,229	-	-	40	/ksf	1,409
5007	Arterial Commercial	2.0	64,248	-	-	40	/ksf	2,570
6001	Office (High-Rise - greater than 100,000 SF)	1.5	487,770	-	-	formula	-	5,594
6102	Religious Facility (without day care)	0.4	17,608	-	-	5	/ksf	88
4112	Freeway	1.0	-	-	-	-	-	-
4114	Parking Lot - Surface	0.5	-	-	-	-	-	-
4118	Road Right of Way	13.4	-	-	-	-	-	-
		37.1	604,855	644	-	-	-	13,693

	Lot Area (ac)	Floor Area (sf)	DU's	Students	Rate	Units	Trips
Total For CP:	**485.3**	**1,756,388**	**7,483**	**4,319**	**-**	**-**	**110,499**

Proposed Land Use Plan (2035)

Legend:

Total CP Area: The area of each land use for the whole TAZ (for CP land uses)

CP Study Area: The area of each land use for only the study area being changed in the IBI Proposal (for CP land uses)

Proposed Study Area: The area of each land use for only the study area being changed in the IBI Proposal (for Proposed land uses)

Lot Area = (Total CP Area) - (CP Study Area) + (Proposed Study Area)

This equation calculates the Lot Area by overlaying the IBI Proposed Land Uses over the Community Plan Land Uses.

For the Commercial/Mixed Use Land Uses, there are two rates that are applied in order to account for the commercial and residential trips generated:

Commercial Trips Generated = (Lot Area sf) x (0.04 Trips/sf) x (0.25 FAR)

Residential Trips Generated = (DU's) x (6 Trips/DU)

TAZ: 3232

LU Code	Land Use	Total CP Area (sf)	CP Study Area (sf)	Proposed Study Area (sf)	Total Proposed Lot Area (sf)	Total CP Floor Area (sf)	CP Study Floor Area (sf)	Proposed Study Floor Area (sf)	Total Proposed Floor Area (sf)	Total CP DU's	CP Study DU's	Proposed DU's	Total Proposed DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	454,395	36,190	0	418,204	-	-	-	-	124	10	0	114	-	9	/DU	1,026
1110	Single Family Detached (20+ du/ac)	40,884	0	0	40,884	-	-	-	-	21	0	0	21	-	9	/DU	189
1210	MF Residential (≤ 20 du/ac)	85,353	13,311	0	72,042	-	-	-	-	29	5	0	24	-	8	/DU	192
1220	MF Residential (20+ du/ac)	515,326	93,258	73,664	495,732	-	-	-	-	484	74	51	461	-	6	/DU	2,764
5007	Arterial Commercial (20+ du/ac) - Residential	0	0	0	0	-	-	-	-	132	132	196	196	-	6	/DU	1,175
5007	Arterial Commercial (20+ du/ac) - Commercial	79,215	79,215	196,485	196,485	19,800	19,800	49,121	49,121	-	-	-	-	-	40	/ksf	1,965
5007	Arterial Commercial	51,193	51,193	0	0	32,855	32,855	0	0	-	-	-	-	-	40	/ksf	0
1190	Single Family Residential Without Units	1,753	0	0	1,753	-	-	-	-	-	-	-	-	-	-	-	-
4118	Road Right of Way	651,769	0	0	651,769	-	-	-	-	-	-	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	36,711	3,563	0	33,148	-	-	-	-	-	-	-	-	-	-	-	-
	Totals:	1,916,598	-	-	1,910,017	-	-	-	49,121	-	-	-	816	-	-	-	7,312

TAZ: 3233

LU Code	Land Use	Total CP Area (sf)	CP Study Area (sf)	Proposed Study Area (sf)	Total Proposed Lot Area (sf)	Total CP Floor Area (sf)	CP Study Floor Area (sf)	Proposed Study Floor Area (sf)	Total Proposed Floor Area (sf)	Total CP DU's	CP Study DU's	Proposed DU's	Total Proposed DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	296,765	0	0	296,765	-	-	-	-	81	0	0	81	-	9	/DU	729
1110	Single Family Detached (20+ du/ac)	15,891	0	0	15,891	-	-	-	-	8	0	0	8	-	9	/DU	72
1210	MF Residential (≤ 20 du/ac)	51,769	4,505	37,167	84,431	-	-	-	-	18	2	17	33	-	8	/DU	265
1220	MF Residential (20+ du/ac)	579,512	45,041	0	534,471	-	-	-	-	501	43	0	458	-	6	/DU	2,748
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	-	-	-	-	-	-	171	20	26	177	-	6	/DU	1,064
5007	Arterial Commercial (20+ du/ac) - Commercial	171,521	19,143	38,342	190,719	41,937	4,785	9,585	46,737	-	-	-	-	-	40	/ksf	1,869
5007	Arterial Commercial	33,944	19,476	0	14,468	19,044	12,217	0	6,827	-	-	-	-	-	40	/ksf	273
4118	Road Right of Way	534,838	0	0	534,838	-	-	-	-	-	-	-	-	-	-	-	-
	Totals:	1,684,240	-	-	1,671,583	-	-	-	53,564	-	-	-	757	-	-	-	7,021

TAZ: 3261

LU Code	Land Use	Total CP Area (sf)	CP Study Area (sf)	Proposed Study Area (sf)	Total Proposed Lot Area (sf)	Total CP Floor Area (sf)	CP Study Floor Area (sf)	Proposed Study Floor Area (sf)	Total Proposed Floor Area (sf)	Total CP DU's	CP Study DU's	Proposed DU's	Total Proposed DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	185,444	67,951	0	117,493	-	-	-	-	45	15	0	30	-	9	/DU	270
1110	Single Family Detached (20+ du/ac)	1,861	0	0	1,861	-	-	-	-	1	0	0	1	-	9	/DU	9
1210	MF Residential (≤ 20 du/ac)	122,339	56,171	44,957	111,125	-	-	-	-	44	20	21	45	-	8	/DU	357
1220	MF Residential (20+ du/ac)	334,834	142,207	107,845	300,472	-	-	-	-	313	141	74	246	-	6	/DU	1,478
5007	Arterial Commercial (≤ 20 du/ac) - Residential	-	-	-	-	-	-	-	-	2	0	0	2	-	6	/DU	12
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	-	-	-	-	-	-	172	88	239	323	-	6	/DU	1,941
5007	Arterial Commercial (≤ 20 du/ac) - Commercial	4,845	0	0	4,845	1,211		0	1,211	-	-	-	-	-	40	/ksf	48
5007	Arterial Commercial (20+ du/ac) - Commercial	121,434	70,395	253,759	304,798	24,595	17,597	63,440	70,438	-	-	-	-	-	40	/ksf	2,818
5007	Arterial Commercial	57,795	53,860	0	3,935	34,229	30,841	0	3,388	-	-	-	-	-	40	/ksf	136
5006	Automobile Dealership	11,175	11,175	0	0	10,774	10,774	0	0	-	-	-	-	-	45	/ksf	0
6102	Religious Facility (without day care)	26,998	0	0	26,998	10,148		0	10,148	-	-	-	-	-	5	/ksf	51
7214	Racquetball/Tennis/Health Club	151,695	0	0	151,695	55,000		0	55,000	-	-	-	-	-	40	/ksf	2,200
1190	Single Family Residential Without Units	1,427	1,427	0	0	-	-	-	-	-	-	-	-	-	-	-	-
4112	Freeway	161,973	0	0	161,973	-	-	-	-	-	-	-	-	-	-	-	-
4114	Parking Lot - Surface	17,679	17,679	0	0	-	-	-	-	-	-	-	-	-	-	-	-
4118	Road Right of Way	596,950	0	0	596,950	-	-	-	-	-	-	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	14,009	14,009	0	0	-	-	-	-	-	-	-	-	-	-	-	-
	Totals:	1,810,458	-	-	1,782,145	-	-	-	140,185	-	-	-	647	-	-	-	9,319

TAZ: 3285

LU Code	Land Use	Total CP Area (sf)	CP Study Area (sf)	Proposed Study Area (sf)	Total Proposed Lot Area (sf)	Total CP Floor Area (sf)	CP Study Floor Area (sf)	Proposed Study Floor Area (sf)	Total Proposed Floor Area (sf)	Total CP DU's	CP Study DU's	Proposed DU's	Total Proposed DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	164,608	61,031	0	103,577	-	-	-	-	42	14	0	28	-	9	/DU	252
1110	Single Family Detached (20+ du/ac)	2,104	0	0	2,104	-	-	-	-	1	0	0	1	-	9	/DU	9
1210	MF Residential (≤ 20 du/ac)	61,929	14,302	41,984	89,611	-	-	-	-	24	6	19	37	-	8	/DU	298
1220	MF Residential (20+ du/ac)	336,574	57,322	0	279,252	-	-	-	-	307	41	0	266	-	6	/DU	1,596
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	-	-	-	-	-	-	129	75	203	257	-	6	/DU	1,544
5009	Other Retail Trade and Strip Commercial (≤ 20 du/ac) - Residential	-	-	-	-	-	-	-	-	2	2	0	0	-	8	/DU	0
5007	Arterial Commercial (20+ du/ac) - Commercial	111,236	55,880	175,368	230,724	27,805	13,969	43,842	57,678	-	-	-	-	-	40	/ksf	2,307
5009	Other Retail Trade and Strip Commercial (≤ 20 du/ac) - Commercial	9,937	9,937	0	0	1,592	1,592	0	0	-	-	-	-	-	36	/ksf	0
5006	Automobile Dealership	14,964	0	0	14,964	1,445	0	0	1,445	-	-	-	-	-	45	/ksf	65
5007	Arterial Commercial	84,721	4,532	0	80,189	88,194	0	0	88,194	-	-	-	-	-	40	/ksf	3,528
5009	Other Retail Trade and Strip Commercial	4,759	4,759	0	0	624	624	0	0	-	-	-	-	-	36	/ksf	0
6805	Junior High School or Middle School	504,621	0	0	504,621	-	-	-	-	-	-	-	-	1,800	1	/Student	2,520
4112	Freeway	162,934	0	0	162,934	-	-	-	-	-	-	-	-	-	-	-	-
4114	Parking Lot - Surface	18,582	0	0	18,582	-	-	-	-	-	-	-	-	-	-	-	-
4118	Road Right of Way	506,146	0	0	506,146	-	-	-	-	-	-	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	13,801	10,675	0	3,126	-	-	-	-	-	-	-	-	-	-	-	-
	Totals:	1,996,915	-	-	1,995,829	-	-	-	147,317	-	-	-	590	-	-	-	12,120

TAZ: 3286

LU Code	Land Use	Total CP Area (sf)	CP Study Area (sf)	Proposed Study Area (sf)	Total Proposed Lot Area (sf)	Total CP Floor Area (sf)	CP Study Floor Area (sf)	Proposed Study Floor Area (sf)	Total Proposed Floor Area (sf)	Total CP DU's	CP Study DU's	Proposed DU's	Total Proposed DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	391,033	74,429	0	316,604	-	-	-	-	99	19	0	80	-	9	/DU	720
1110	Single Family Detached (20+ du/ac)	13,948	0	0	13,948	-	-	-	-	9	0	0	9	-	9	/DU	81
1210	MF Residential (≤ 20 du/ac)	165,589	5,698	37,088	196,979	-	-	-	-	59	2	17	74	-	8	/DU	592
1220	MF Residential (20+ du/ac)	926,422	199,842	98,253	824,832	-	-	-	-	1,019	202	68	885	-	6	/DU	5,308
5007	Arterial Commercial (≤ 20 du/ac) - Residential	-	-	-	-	-	-	-	-	2	2	0	0	-	8	/DU	0
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	-	-	-	-	-	-	174	34	277	417	-	6	/DU	2,503
5007	Arterial Commercial (≤ 20 du/ac) - Commercial	14,432	14,432	0	0	10,057	10,057	0	0	-	-	-	-	-	40	/ksf	0
5007	Arterial Commercial (20+ du/ac) - Commercial	115,252	30,877	271,426	355,801	28,806	7,717	67,857	88,946	-	-	-	-	-	40	/ksf	3,558
5006	Automobile Dealership	60,647	60,647	0	0	81,832	81,832	0	0	-	-	-	-	-	45	/ksf	0
5007	Arterial Commercial	106,449	31,827	0	74,622	115,521	25,797	0	89,724	-	-	-	-	-	40	/ksf	3,589
6002	Office (Low-Rise - less or equal to 100,000 SF)	12,195	12,195	12,195	12,195	8,740	8,740	3,049	3,049	-	-	-	-	-	formula	-	121
6102	Religious Facility (without day care)	58,033	0	0	58,033	26,987	0	0	26,987	-	-	-	-	-	5	/ksf	135
6509	Other Health Care	21,365	0	0	21,365	8,445	0	0	8,445	-	-	-	-	-	50	/ksf	422
6806	Elementary School	63,195	0	0	63,195	-	-	-	-	-	-	-	-	199	3	/Student	577
7601	Park - Active	6,963	0	0	6,963	-	-	-	-	-	-	-	-	-	50	/acre	8
4112	Freeway	172,918	0	0	172,918	-	-	-	-	-	-	-	-	-	-	-	-
4114	Parking Lot - Surface	56,958	12,392	0	44,566	-	-	-	-	-	-	-	-	-	-	-	-
4118	Road Right of Way	1,218,430	0	0	1,218,430	-	-	-	-	-	-	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	11,966	5,270	0	6,696	-	-	-	-	-	-	-	-	-	-	-	-
	Totals:	2,845,226	-	-	3,387,148	-	-	-	217,150	-	-	-	1,465	-	-	-	17,613

TAZ: 3302

LU Code	Land Use	Total CP Area (sf)	CP Study Area (sf)	Proposed Study Area (sf)	Total Proposed Lot Area (sf)	Total CP Floor Area (sf)	CP Study Floor Area (sf)	Proposed Study Floor Area (sf)	Total Proposed Floor Area (sf)	Total CP DU's	CP Study DU's	Proposed DU's	Total Proposed DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	386,489	12,037	0	374,452	-	-	-	-	108	2	0	106	-	9	/DU	954
1110	Single Family Detached (20+ du/ac)	29,198	0	0	29,198	-	-	-	-	15	0	0	15	-	9	/DU	135
1210	MF Residential (≤ 20 du/ac)	289,515	35,552	92,510	346,473	-	-	-	-	108	11	37	134	-	8	/DU	1,075
1220	MF Residential (20+ du/ac)	1,066,577	154,028	0	912,549	-	-	-	-	1,130	163	0	967	-	6	/DU	5,802
5007	Arterial Commercial (≤ 20 du/ac) - Residential	-	-	-	-	-	-	-	-	0	0	10	10		6	/DU	59
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	-	-	-	-	-	-	46	14	108	140	-	6	/DU	839
5007	Arterial Commercial (≤ 20 du/ac) - Commercial	0	0	21,357	21,357	0	0	5,339	5,339	-	-	-	-	-	40	/ksf	214
5007	Arterial Commercial (20+ du/ac) - Commercial	67,988	18,991	156,589	205,585	17,793	5,548	39,147	51,392	-	-	-	-	-	40	/ksf	2,056
5007	Arterial Commercial	89,650	58,610	0	31,040	44,313	17,590	0	26,723	-	-	-	-	-	40	/ksf	1,069
6002	Office (Low-Rise - less or equal to 100,000 SF)	53,852	0	0	53,852	98,468	0	0	98,468	-	-	-	-	-	formula	-	1,669
6102	Religious Facility (without day care)	7,365	0	0	7,365	6,076	0	0	6,076	-	-	-	-	-	5	/ksf	30
6806	Elementary School	199,900	0	0	199,900	-	-	-	-	-	-	-	-	690	3	/Student	2,001
1290	Multi-Family Residential Without Units	4,029	0	0	4,029	-	-	-	-	-	-	-	-	-	-	-	-
4113	Communications and Utilities	83,723	83,723	56,693	56,693	-	-	-	-	-	-	-	-	-	-	-	-
4114	Parking Lot - Surface	6,543	6,543	0	0	-	-	-	-	-	-	-	-	-	-	-	-
4115	Parking Lot - Structure	46,142	0	0	46,142	-	-	-	-	-	-	-	-	-	-	-	-
4118	Road Right of Way	923,680	0	0	923,680	-	-	-	-	-	-	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	19,757	7,080	0	12,676	-	-	-	-	-	-	-	-	-	-	-	-
	Totals:	3,274,406	-	-	3,224,991	-	-	-	187,998	-	-	-	1,372	-	-	-	15,902

TAZ: 3334

LU Code	Land Use	Total CP Area (sf)	CP Study Area (sf)	Proposed Study Area (sf)	Total Proposed Lot Area (sf)	Total CP Floor Area (sf)	CP Study Floor Area (sf)	Proposed Study Floor Area (sf)	Total Proposed Floor Area (sf)	Total CP DU's	CP Study DU's	Proposed DU's	Total Proposed DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	68,397	13,848	0	54,549	-	-	-	-	19	4	0	15	-	9	/DU	135
1110	Single Family Detached (20+ du/ac)	5,443	0	0	5,443	-	-	-	-	3	0	0	3	-	9	/DU	27
1210	MF Residential (≤ 20 du/ac)	42,465	13,823	87,533	116,175	-	-	-	-	17	6	30	41	-	8	/DU	330
1220	MF Residential (20+ du/ac)	339,561	89,007	0	250,554	-	-	-	-	495	78	0	417	-	6	/DU	2,502
5007	Arterial Commercial (≤ 20 du/ac) - Residential	-	-	-	-	-	-	-	-	1	1	14	14	-	8	/DU	110
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	-	-	-	-	-	-	191	76	98	213	-	6	/DU	1,275
5009	Other Retail Trade and Strip Commercial (≤ 20 du/ac) - Residential	-	-	-	-	-	-	-	-	2	1	0	1	-	8	/DU	8
5007	Arterial Commercial (≤ 20 du/ac) - Commercial	6,641	6,641	29,937	29,937	7,702	7,702	7,484	7,484	-	-	-	-	-	40	/ksf	299
5007	Arterial Commercial (20+ du/ac) - Commercial	174,828	101,026	116,850	190,652	53,648	25,253	29,213	57,608	-	-	-	-	-	40	/ksf	2,304
5009	Other Retail Trade and Strip Commercial (≤ 20 du/ac) - Commercial	12,528	6,799	0	5,729	1,012	1,012	0	0	-	-	-	-	-	36	/ksf	0
5007	Arterial Commercial	87,416	36,465	0	50,951	64,174	31,101	0	33,073	-	-	-	-	-	40	/ksf	1,323
5009	Other Retail Trade and Strip Commercial	16,805	0	0	16,805	21,798	0	0	21,798	-	-	-	-	-	36	/ksf	785
6007	Medical Office (less or equal to 100,000 SF)	23,117	0	0	23,117	39,400	0	0	39,400	-	-	-	-	-	50	/ksf	1,970
6806	Elementary School	244,059	0	0	244,059	-	-	-	-	-	-	-	-	1,000	3	/Student	2,900
7600	Parks	5,348	0	0	5,348	-	-	-	-	-	-	-	-	-	50	/acre	6
7601	Park - Active	41,359	0	0	41,359	-	-	-	-	-	-	-	-	-	50	/acre	47
4112	Freeway	194,707	0	0	194,707	-	-	-	-	-	-	-	-	-	-	-	-
4118	Road Right of Way	502,382	0	0	502,382	-	-	-	-	-	-	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	4,016	0	0	4,016	-	-	-	-	-	-	-	-	-	-	-	-
	Totals:	1,769,072	-	-	1,735,782	-	-	-	159,363	-	-	-	704	-	-	-	14,022

TAZ: 3363

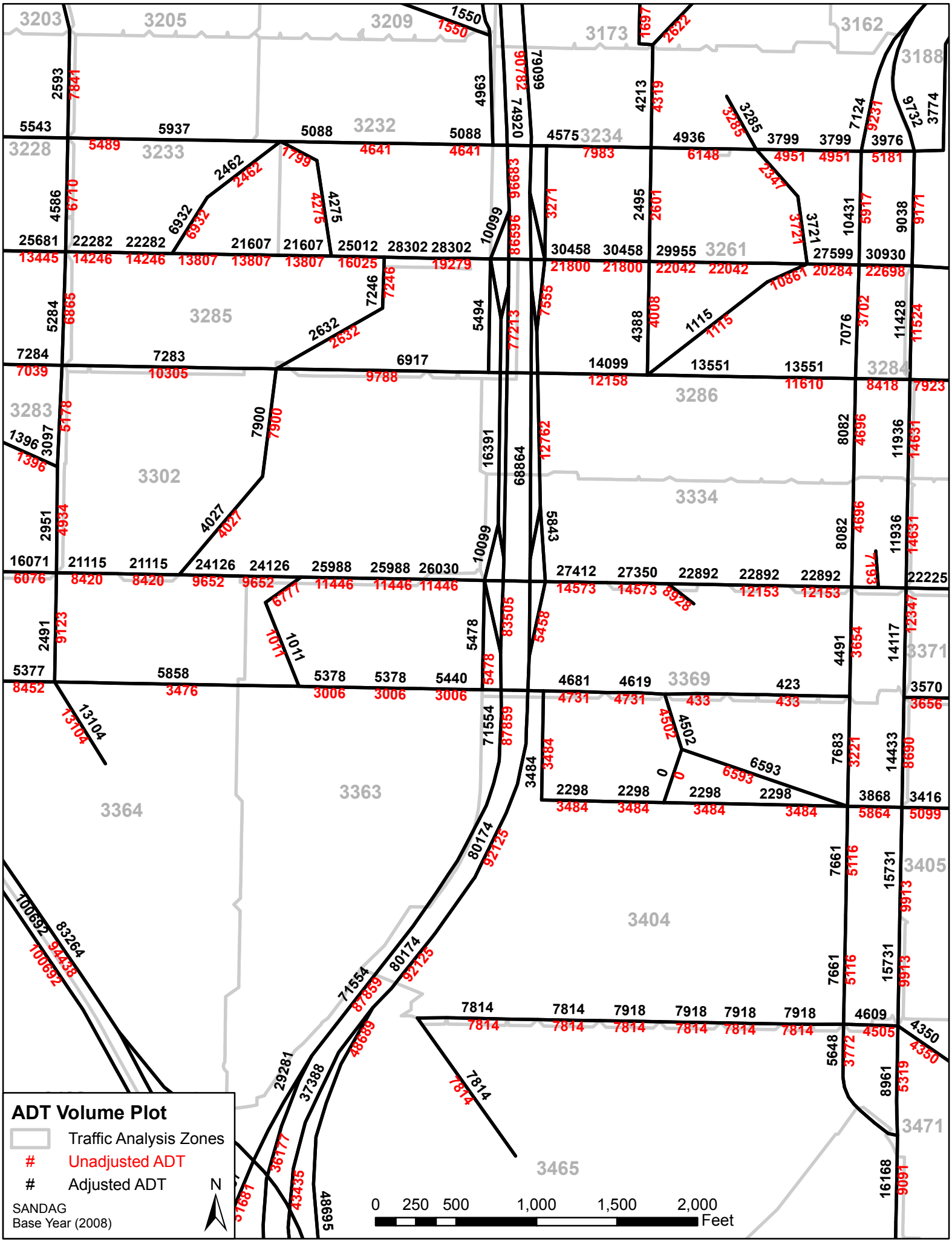
LU Code	Land Use	Total CP Area (sf)	CP Study Area (sf)	Proposed Study Area (sf)	Total Proposed Lot Area (sf)	Total CP Floor Area (sf)	CP Study Floor Area (sf)	Proposed Study Floor Area (sf)	Total Proposed Floor Area (sf)	Total CP DU's	CP Study DU's	Proposed DU's	Total Proposed DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	569,696	37,751	0	531,945	-	-	-	-	124	8	0	116	-	9	/DU	1,044
1110	Single Family Detached (20+ du/ac)	22,833	0	0	22,833	-	-	-	-	12	0	0	12	-	9	/DU	108
1210	MF Residential (≤ 20 du/ac)	456,529	80,393	131,176	507,312	-	-	-	-	148	31	47	164	-	8	/DU	1,312
1220	MF Residential (20+ du/ac)	380,043	186,312	0	193,731	-	-	-	-	338	177	0	161	-	6	/DU	966
5007	Arterial Commercial (≤ 20 du/ac) - Residential	-	-	-	-	-	-	-	-	46	0	20	66	-	8	/DU	524
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	-	-	-	-	-	-	23	23	251	251	-	6	/DU	1,509
5007	Arterial Commercial (≤ 20 du/ac) - Commercial	184,861	0	42,604	227,465	46,215	0	10,651	56,866	-	-	-	-	-	40	/ksf	2,275
5007	Arterial Commercial (20+ du/ac) - Commercial	21,841	21,841	274,028	274,028	6,566	6,566	68,507	68,507	-	-	-	-	-	40	/ksf	2,740
5006	Automobile Dealership	21,377	21,377	0	0	10,131	10,131	0	0	-	-	-	-	-	45	/ksf	0
5007	Arterial Commercial	81,878	81,878	0	0	52,514	52,514	0	0	-	-	-	-	-	40	/ksf	0
5009	Other Retail Trade and Strip Commercial	13,774	13,774	0	0	5,666	5,666	0	0	-	-	-	-	-	36	/ksf	0
6102	Religious Facility (without day care)	48,640	20,672	0	27,968	26,416	5,912	0	20,504	-	-	-	-	-	5	/ksf	103
6806	Elementary School	306,748	0	0	306,748	-	-	-	-	-	-	-	-	630	3	/Student	1,827
7601	Park - Active	514,680	0	0	514,680	-	-	-	-	-	-	-	-	-	50	/acre	591
7603	Open Space Park or Preserve	85,762	0	0	85,762	-	-	-	-	-	-	-	-	-	5	/acre	10
1190	Single Family Residential Without Units	1,624	0	0	1,624	-	-	-	-	-	-	-	-	-	-	-	-
4114	Parking Lot - Surface	7,129	7,129	0	0	-	-	-	-	-	-	-	-	-	-	-	-
4118	Road Right of Way	924,683	0	0	924,683	-	-	-	-	-	-	-	-	-	-	-	-
9101	Vacant and Undeveloped Land	13,459	6,806	0	6,652	-	-	-	-	-	-	-	-	-	-	-	-
	Totals:	3,655,557	-	-	3,625,430	-	-	-	145,877	-	-	-	770	-	-	-	13,008

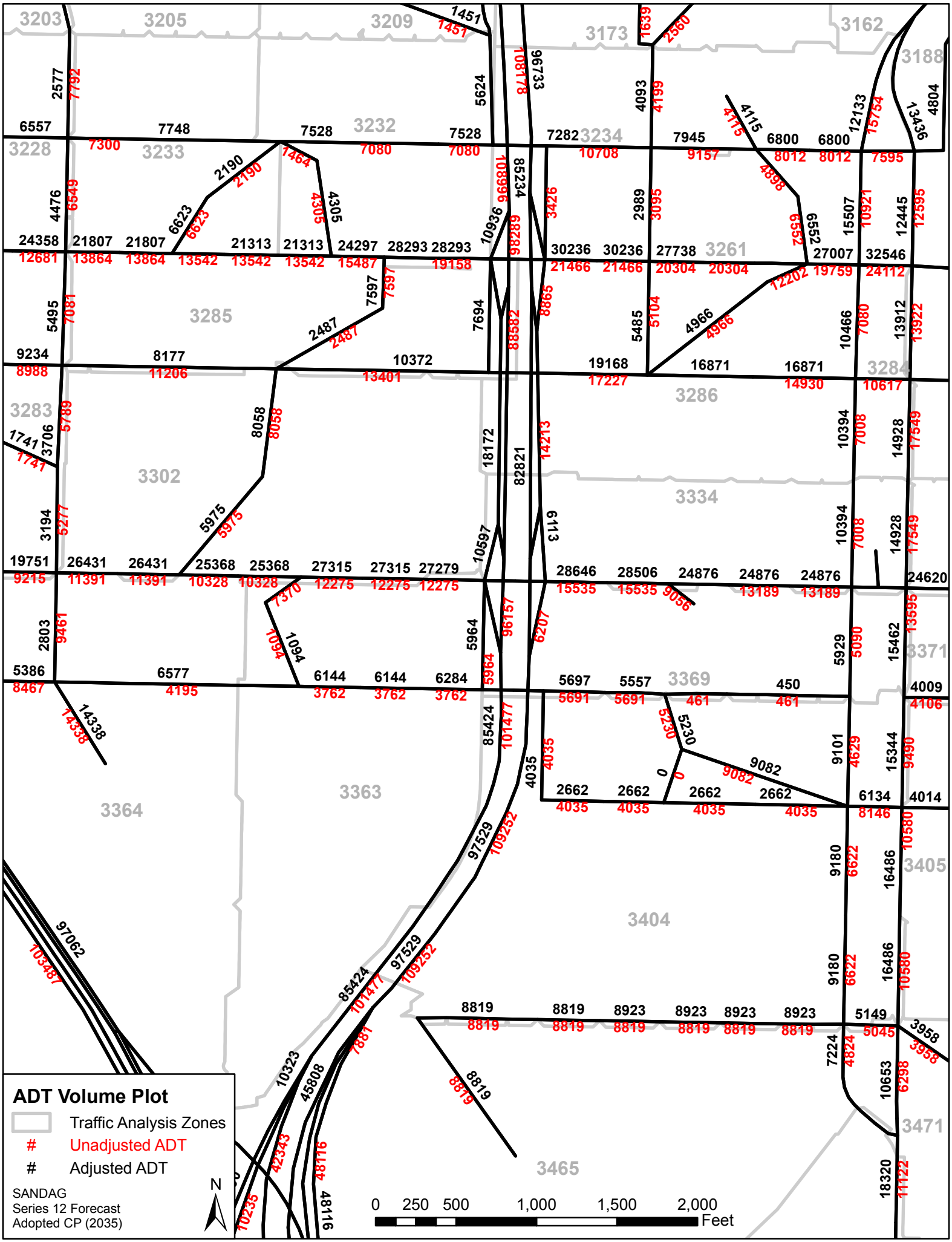
TAZ: 3369

LU Code	Land Use	Total CP Area (sf)	CP Study Area (sf)	Proposed Study Area (sf)	Total Proposed Lot Area (sf)	Total CP Floor Area (sf)	CP Study Floor Area (sf)	Proposed Study Floor Area (sf)	Total Proposed Floor Area (sf)	Total CP DU's	CP Study DU's	Proposed DU's	Total Proposed DU's	Students	Rate	Units	Trips
1110	Single Family Detached (≤ 20 du/ac)	144,213	31,239	0	112,973	-	-	-	-	36	6	0	30	-	9	/DU	270
1110	Single Family Detached (20+ du/ac)	874	0	0	874	-	-	-	-	1	0	0	1	-	9	/DU	9
1210	MF Residential (≤ 20 du/ac)	90,222	5,244	77,762	162,739	-	-	-	-	28	2	27	53	-	8	/DU	423
1220	MF Residential (20+ du/ac)	422,463	108,398	0	314,065	-	-	-	-	462	117	0	345	-	6	/DU	2,070
5007	Arterial Commercial (≤ 20 du/ac) - Residential	-	-	-	-	-	-	-	-	0	0	18	18	-	8	/DU	146
5007	Arterial Commercial (20+ du/ac) - Residential	-	-	-	-	-	-	-	-	117	90	191	218	-	6	/DU	1,308
5007	Arterial Commercial (≤ 20 du/ac) - Commercial	0	0	39,815	39,815	0	0	9,954	9,954	-	-	-	-	-	40	/ksf	398
5007	Arterial Commercial (20+ du/ac) - Commercial	140,938	114,042	209,920	236,817	35,229	28,506	52,480	59,203	-	-	-	-	-	40	/ksf	2,368
5007	Arterial Commercial	87,755	67,759	0	19,996	64,248	45,649	0	18,599	-	-	-	-	-	40	/ksf	744
6001	Office (High-Rise - greater than 100,000 SF)	64,457	0	0	64,457	487,770	0	0	487,770	-	-	-	-	-	formula	-	5,594
6102	Religious Facility (without day care)	18,310	18,310	0	0	17,608	17,608	0	0	-	-	-	-	-	5	/ksf	0
4112	Freeway	41,475	0	0	41,475	-	-	-	-	-	-	-	-	-	-	-	-
4114	Parking Lot - Surface	21,999	10,030	0	11,968	-	-	-	-	-	-	-	-	-	-	-	-
4118	Road Right of Way	582,133	0	0	582,133	-	-	-	-	-	-	-	-	-	-	-	-
	Totals:	1,614,838	-	-	1,587,312	-	-	-	575,526	-	-	-	665	-	-	-	13,331

Appendix B

Base Year, 2035, and Proposed Model Output


ADT Volume Plot
Traffic Analysis Zones
Unadjusted ADT
Adjusted ADT
SANDAG
Base Year (2008)
N
0 250 500 1,000 1,500 2,000
Feet


ADT Volume Plot
Traffic Analysis Zones
Unadjusted ADT
Adjusted ADT
SANDAG
Series 12 Forecast
Adopted CP (2035)
N
0 250 500 1,000 1,500 2,000
Feet

SANDAG
Series 12 Forecast
2011 RTP

ADT Volume Plot

Functional Classifications

- Freeway
- Prime
- Major
- Collector
- Light Collector
- Rural Collector
- Local
- Freeway Ramp
- Local Ramp
- Zone Connector

Traffic Analysis Zones

\# Unadjusted ADT(x1000)

\# Adjusted ADT(x1000)

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N

0 0.03 0.06 0.09
Miles

SANDAG
servicebureau

May 14, 2012

Appendix C

Recommended Forecast ADT Volume Adjustments

Roadway Segment	MAUREEN'S SUGGESTED Approximate Range of Future Volumes to use for MidCity BRT SAS
El Cajon Bl (37th - SR 15)	28K - 30K
El Cajon Bl (SR 15 - Marlborough)	38K - 40K
Orange Ave (Cherokee Av W - 39th)	9.5K
Orange Ave (42 St W - 42 St E)	13K
University Ave (39th St - SR 15)	27K - 29K
University Av (SR-15 SB - SR 15 NB)	
University Ave (SR 15 - Marlborough)	33K

Source: City of San Diego

																	MCSAP		SANDAG Forecasts from Website						
Roadway Segment	City Traffic counts														Average past counts	Historical High Count	MCSAP Future volumes used in 6-2012 Study for ACP (Pre-Land Use Assumption Modifications)	MCSAP Future volumes used in 6-2012 Study for Proposed Scenario = Adjusted Sr 12 2035 MCSAP Forecast Volume (Pre-Land Use Assumption Modifications)	Series 11 2030 adjusted (not calibrated)	Series 12 2035 adjusted (not calibrated)	Series 12 2050 adjusted (not calibrated)	Metro Center Traffic Study (2002) Buildout volumes	For discussion Future volumes - ACP	For discussion Future volumes Proposed MCSAP	
El Cajon Bl (37th - SR 15)	23,030	2002	23,370	2006	24,700	2007	24,025	2009	21,715	2010	21,700	2012			23,090	24,700	28,300	29,300	31,000	29,600	32,000	27,710 but west of 39th	ok	ok	
El Cajon Bl (SR 15 - Marlborough)	29,640	2002	30,760	2002	35,800	2005	26,990	2008	31,945	2011					31,027	35,800	30,200	31,500	42,000	30,900	33,900	35,710	low	low	38-40K
Orange Ave (Cherokee Av W - 39th)			7,930	2000	7,180	2004	7,300	2007	7,360	2010					7,443	7,930		9,300	11,000	10,800	12,600	9,565		ok	
Orange Ave (42 St W - 42 St E)									9,870	2010					9,870	9,870		14,200	20,000	20,600	22,700		high	high	13K
University Ave (39th St - SR 15)					23,700	2004									23,700	23,700	27,300	32,000	25,000	28,200	29,400	19,625 but west of 39th	ok	high 29K	why is proposed so much higher - may not be worth answering since these were the premodified traffic volumes
University Av (SR-15 SB - SR 15 NB)							27,785	2009	26,500	2012					27,143	27,785			26,000	26,600	29,200				
University Ave (SR 15 - Marlborough)	25,900	1990	22,500	1991	23,700	2004	32,370	2002	29,260	2004	27,120	2007	27,620	2010	26,924	32,370	28,600	33,400	34,000	30,400	33,200	24,325 but probably east	low 33K	ok	why is proposed so much higher - may not be worth answering since these were the premodified traffic volumes
Source: City of San Diego																									

Appendix D

City of San Diego Traffic Impact Study Roadway Classification and LOS Table

TABLE 2
Roadway Classifications, Levels of Service (LOS)
and Average Daily Traffic (ADT)

			LEVEL OF SERVICE				
STREET CLASSIFICATION	LANES	CROSS SECTIONS	A	B	C	D	E
Freeway	8 lanes		60,000	84,000	120,000	140,000	150,000
Freeway	6 lanes		45,000	63,000	90,000	110,000	120,000
Freeway	4 lanes		30,000	42,000	60,000	70,000	80,000
Expressway	6 lanes	102/122	30,000	42,000	60,000	70,000	80,000
Primary Arterial	6 lanes	102/122	25,000	35,000	50,000	55,000	60,000
Major Arterial	6 lanes	102/122	20,000	28,000	40,000	45,000	50,000
Major Arterial	4 lanes	78/98	15,000	21,000	30,000	35,000	40,000
Collector	4 lanes	72/92	10,000	14,000	20,000	25,000	30,000
Collector (no center lane) continuous left-turn lane)	4 lanes 2 lanes	64/84 50/70	5,000	7,000	10,000	13,000	15,000
Collector (no fronting property)	2 lanes	40/60	4,000	5,500	7,500	9,000	10,000
Collector (commercial-industrial fronting)	2 lanes	50/70	2,500	3,500	5,000	6,500	8,000
Collector (multifamily)	2 lanes	40/60	2,500	3,500	5,000	6,500	8,000
Sub-Collector (single-family)	2 lanes	36/56	—	—	2,200	—	—

LEGEND:

XXX/XXX = Curb to curb width (feet)/right-of-way width (feet): based on the City of San Diego Street Design. Manual

XX/XXX= Approximate recommended ADT based on the City of San Diego Street Design Manual.

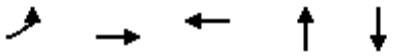
NOTES:

1. The volumes and the average daily level of service listed above are only intended as a general planning guideline.

2. Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

Appendix E

2035 Adopted Community Plan Scenario – Synchro Sheets (Intersection & Queue)



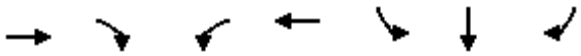
Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	33	696	837	195	142
v/c Ratio	0.22	0.26	0.35	0.34	0.28
Control Delay	37.2	11.9	17.1	14.0	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	11.9	17.1	14.0	14.9
Queue Length 50th (ft)	16	73	93	46	37
Queue Length 95th (ft)	41	98	161	92	76
Internal Link Dist (ft)		109	1248	382	134
Turn Bay Length (ft)	100				
Base Capacity (vph)	179	2682	2380	674	599
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.18	0.26	0.35	0.29	0.24

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	20	610	30	0	740	30	50	60	70	70	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.4	4.9			4.9			4.9			4.9
Lane Util. Factor		1.00	0.91			0.91			1.00			1.00
Frt		1.00	0.99			0.99			0.95			0.97
Flt Protected		0.95	1.00			1.00			0.99			0.97
Satd. Flow (prot)		1770	5049			5055			1741			1757
Flt Permitted		1.00	1.00			1.00			0.89			0.79
Satd. Flow (perm)		1863	5049			5055			1565			1419
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	22	663	33	0	804	33	54	65	76	76	33
RTOR Reduction (vph)	0	0	6	0	0	5	0	0	32	0	0	15
Lane Group Flow (vph)	0	33	690	0	0	832	0	0	163	0	0	127
Turn Type	custom	Prot						Perm			Perm	
Protected Phases		5	2			6			8			4
Permitted Phases	5							8			4	
Actuated Green, G (s)		3.1	42.4			34.9			27.8			27.8
Effective Green, g (s)		3.1	42.4			34.9			27.8			27.8
Actuated g/C Ratio		0.04	0.53			0.44			0.35			0.35
Clearance Time (s)		4.4	4.9			4.9			4.9			4.9
Vehicle Extension (s)		2.0	1.0			1.0			2.0			2.0
Lane Grp Cap (vph)		72	2676			2205			544			493
v/s Ratio Prot			0.14			c0.16						
v/s Ratio Perm		c0.02							c0.10			0.09
v/c Ratio		0.46	0.26			0.38			0.30			0.26
Uniform Delay, d1		37.6	10.2			15.2			19.0			18.7
Progression Factor		1.00	1.00			1.00			1.00			1.00
Incremental Delay, d2		1.7	0.2			0.5			0.1			0.1
Delay (s)		39.3	10.5			15.7			19.1			18.8
Level of Service		D	B			B			B			B
Approach Delay (s)			11.8			15.7			19.1			18.8
Approach LOS			B			B			B			B

Intersection Summary			
HCM Average Control Delay	14.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	33
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

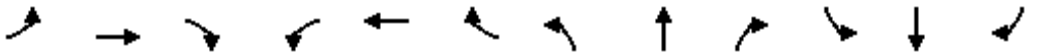


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1054	348	641	1217	413	200	180
v/c Ratio	0.85	0.72	1.06	0.42	0.38	0.36	0.35
Control Delay	48.3	21.7	100.6	20.0	28.6	25.5	19.1
Queue Delay	0.3	0.0	429.8	1.4	0.2	0.0	0.0
Total Delay	48.6	21.7	530.4	21.4	28.7	25.5	19.1
Queue Length 50th (ft)	200	62	~494	170	109	91	58
Queue Length 95th (ft)	241	172	#721	224	152	157	121
Internal Link Dist (ft)	1248			230		598	
Turn Bay Length (ft)		100			200		
Base Capacity (vph)	1245	486	603	2925	1101	557	519
Starvation Cap Reductn	0	0	288	1433	0	0	0
Spillback Cap Reductn	18	0	0	0	160	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.72	2.03	0.82	0.44	0.36	0.35

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	970	320	590	1120	0	0	0	0	380	120	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	4.2	5.0					5.6	5.6	5.6
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97	0.95	0.95
Frpb, ped/bikes		1.00	0.94	1.00	1.00					1.00	0.99	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00					0.99	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.95	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		6408	1496	1770	5085					3401	1662	1467
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		6408	1496	1770	5085					3401	1662	1467
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1054	348	641	1217	0	0	0	0	413	130	250
RTOR Reduction (vph)	0	0	195	0	0	0	0	0	0	0	18	44
Lane Group Flow (vph)	0	1054	153	641	1217	0	0	0	0	413	182	136
Confl. Peds. (#/hr)			10	10			10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		20.4	20.4	35.8	60.4					34.0	34.0	34.0
Effective Green, g (s)		20.4	20.4	35.8	60.4					34.0	34.0	34.0
Actuated g/C Ratio		0.19	0.19	0.34	0.58					0.32	0.32	0.32
Clearance Time (s)		5.0	5.0	4.2	5.0					5.6	5.6	5.6
Vehicle Extension (s)		0.2	0.2	0.2	0.2					0.2	0.2	0.2
Lane Grp Cap (vph)		1245	291	603	2925					1101	538	475
v/s Ratio Prot		c0.16		c0.36	0.24						0.11	
v/s Ratio Perm			0.10							c0.12		0.09
v/c Ratio		0.85	0.53	1.06	0.42					0.38	0.34	0.29
Uniform Delay, d1		40.8	38.0	34.6	12.5					27.3	27.0	26.5
Progression Factor		1.00	1.00	1.54	1.56					1.00	1.00	1.00
Incremental Delay, d2		7.2	6.7	50.9	0.4					1.0	1.7	1.5
Delay (s)		48.0	44.6	104.1	19.8					28.3	28.7	28.0
Level of Service		D	D	F	B					C	C	C
Approach Delay (s)		47.2			48.9			0.0			28.3	
Approach LOS		D			D			A			C	

Intersection Summary			
HCM Average Control Delay	44.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

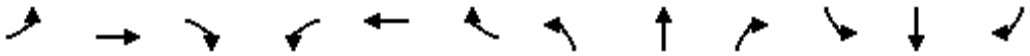
Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	380	1022	1543	717	217	335	328
v/c Ratio	0.98	0.33	0.70	0.95	0.22	0.66	0.66
Control Delay	94.3	10.3	33.2	41.6	26.9	28.2	28.0
Queue Delay	85.2	0.2	0.5	0.0	0.1	0.0	0.0
Total Delay	179.5	10.4	33.7	41.6	27.0	28.2	28.0
Queue Length 50th (ft)	277	76	277	~312	52	136	132
Queue Length 95th (ft)	m#401	90	322	#560	80	236	231
Internal Link Dist (ft)		230	588			231	
Turn Bay Length (ft)				90	140		
Base Capacity (vph)	389	3075	2210	756	1167	576	566
Starvation Cap Reductn	76	1035	0	0	0	0	0
Spillback Cap Reductn	0	0	268	0	292	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.21	0.50	0.79	0.95	0.25	0.58	0.58

Intersection Summary

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

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

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



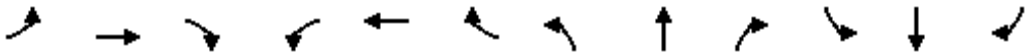
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	350	940	0	0	1420	660	200	30	580	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.0			5.0	5.0	5.6	5.6	5.6			
Lane Util. Factor	1.00	0.91			0.86	1.00	0.97	0.95	0.95			
Frpb, ped/bikes	1.00	1.00			1.00	0.95	1.00	0.98	0.98			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	0.99	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	5085			6408	1511	3403	1497	1468			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	5085			6408	1511	3403	1497	1468			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	380	1022	0	0	1543	717	217	33	630	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	235	0	67	67	0	0	0
Lane Group Flow (vph)	380	1022	0	0	1543	482	217	268	261	0	0	0
Confl. Peds. (#/hr)	10					10	10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	5	2			6			8				
Permitted Phases						6	8		8			
Actuated Green, G (s)	23.1	63.5			36.2	36.2	30.9	30.9	30.9			
Effective Green, g (s)	23.1	63.5			36.2	36.2	30.9	30.9	30.9			
Actuated g/C Ratio	0.22	0.60			0.34	0.34	0.29	0.29	0.29			
Clearance Time (s)	4.2	5.0			5.0	5.0	5.6	5.6	5.6			
Vehicle Extension (s)	0.2	0.2			0.2	0.2	0.2	0.2	0.2			
Lane Grp Cap (vph)	389	3075			2209	521	1001	441	432			
v/s Ratio Prot	c0.21	0.20			0.24			c0.18				
v/s Ratio Perm						c0.32	0.06		0.18			
v/c Ratio	0.98	0.33			0.70	0.92	0.22	0.61	0.60			
Uniform Delay, d1	40.7	10.3			29.7	33.1	27.9	31.8	31.8			
Progression Factor	1.55	0.87			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	31.5	0.2			1.9	24.6	0.0	1.6	1.6			
Delay (s)	94.4	9.2			31.6	57.7	28.0	33.5	33.4			
Level of Service	F	A			C	E	C	C	C			
Approach Delay (s)		32.3			39.8			32.1			0.0	
Approach LOS		C			D			C			A	

Intersection Summary			
HCM Average Control Delay	36.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	98	1119	54	1500	272	98
v/c Ratio	0.68	0.47	0.45	0.70	0.60	0.18
Control Delay	57.8	16.7	44.8	22.5	22.7	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	16.7	44.8	22.5	22.7	9.3
Queue Length 50th (ft)	42	150	23	228	75	14
Queue Length 95th (ft)	#118	196	#64	#329	139	41
Internal Link Dist (ft)		588		574	300	317
Turn Bay Length (ft)	95		90			
Base Capacity (vph)	145	2356	119	2157	580	681
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.47	0.45	0.70	0.47	0.14

Intersection Summary

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



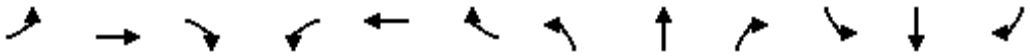
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	990	40	50	1350	30	180	20	50	20	30	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9			4.9			4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.97			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1770	5056		1770	5069			1750			1733	
Flt Permitted	0.95	1.00		0.95	1.00			0.76			0.90	
Satd. Flow (perm)	1770	5056		1770	5069			1369			1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	1076	43	54	1467	33	196	22	54	22	33	43
RTOR Reduction (vph)	0	5	0	0	3	0	0	15	0	0	29	0
Lane Group Flow (vph)	98	1114	0	54	1497	0	0	257	0	0	69	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	4.6	30.8		2.7	28.9			22.3			22.3	
Effective Green, g (s)	4.6	30.8		2.7	28.9			22.3			22.3	
Actuated g/C Ratio	0.07	0.44		0.04	0.41			0.32			0.32	
Clearance Time (s)	4.4	4.9		4.4	4.9			4.9			4.9	
Vehicle Extension (s)	2.0	3.2		2.0	3.2			2.0			2.0	
Lane Grp Cap (vph)	116	2225		68	2093			436			504	
v/s Ratio Prot	c0.06	0.22		0.03	c0.30							
v/s Ratio Perm								c0.19			0.04	
v/c Ratio	0.84	0.50		0.79	0.72			0.59			0.14	
Uniform Delay, d1	32.3	14.1		33.4	17.1			20.0			17.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	38.7	0.8		43.2	2.1			1.3			0.0	
Delay (s)	71.0	14.9		76.6	19.2			21.3			17.0	
Level of Service	E	B		E	B			C			B	
Approach Delay (s)		19.4			21.2			21.3			17.0	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	22	837	65	554	391	76	326	337	174
v/c Ratio	0.08	0.96	0.61	0.63	0.41	0.16	0.45	0.99	0.24
Control Delay	11.3	42.5	43.8	18.0	2.8	15.2	12.3	70.9	10.2
Queue Delay	0.0	0.0	0.0	1.7	0.1	0.0	0.0	0.0	0.0
Total Delay	11.3	42.5	43.8	19.7	2.9	15.2	12.3	70.9	10.2
Queue Length 50th (ft)	5	326	20	169	0	21	62	141	30
Queue Length 95th (ft)	17	#574	#83	269	41	48	127	#302	69
Internal Link Dist (ft)		289		315			568		302
Turn Bay Length (ft)	150		150			100		230	
Base Capacity (vph)	261	878	107	881	955	471	724	342	719
Starvation Cap Reductn	0	0	0	174	93	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.95	0.61	0.78	0.45	0.16	0.45	0.99	0.24

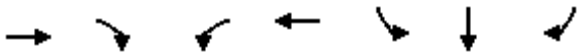
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	740	30	60	510	360	70	100	200	310	90	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.90		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1852		1770	1863	1583	1770	1677		1770	1741	
Flt Permitted	0.30	1.00		0.12	1.00	1.00	0.65	1.00		0.47	1.00	
Satd. Flow (perm)	551	1852		226	1863	1583	1206	1677		875	1741	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	804	33	65	554	391	76	109	217	337	98	76
RTOR Reduction (vph)	0	2	0	0	0	207	0	70	0	0	40	0
Lane Group Flow (vph)	22	835	0	65	554	184	76	256	0	337	134	0
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	32.9	32.9		32.9	32.9	32.9	27.3	27.3		27.3	27.3	
Effective Green, g (s)	32.9	32.9		32.9	32.9	32.9	27.3	27.3		27.3	27.3	
Actuated g/C Ratio	0.47	0.47		0.47	0.47	0.47	0.39	0.39		0.39	0.39	
Clearance Time (s)	4.9	4.9		4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Vehicle Extension (s)	4.2	4.2		4.2	4.2	4.2	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	259	870		106	876	744	470	654		341	679	
v/s Ratio Prot		c0.45			0.30			0.15			0.08	
v/s Ratio Perm	0.04			0.29		0.12	0.06			c0.39		
v/c Ratio	0.08	0.96		0.61	0.63	0.25	0.16	0.39		0.99	0.20	
Uniform Delay, d1	10.2	17.9		13.8	14.0	11.1	13.9	15.4		21.2	14.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	22.2		23.7	3.5	0.8	0.1	0.1		45.0	0.1	
Delay (s)	10.9	40.1		37.5	17.5	11.9	14.0	15.5		66.2	14.2	
Level of Service	B	D		D	B	B	B	B		E	B	
Approach Delay (s)		39.3			16.6			15.2			48.5	
Approach LOS		D			B			B			D	

Intersection Summary			
HCM Average Control Delay	29.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

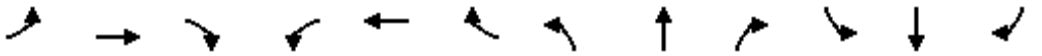


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1054	511	402	750	380	245	222
v/c Ratio	0.64	0.68	0.98	0.35	0.40	0.49	0.40
Control Delay	27.6	12.4	74.9	10.1	24.9	21.5	7.5
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0	0.0
Total Delay	27.6	12.4	74.9	10.6	24.9	21.5	7.5
Queue Length 50th (ft)	182	53	~240	110	78	80	13
Queue Length 95th (ft)	230	172	#413	147	114	149	66
Internal Link Dist (ft)	315			260		545	
Turn Bay Length (ft)		95			250		
Base Capacity (vph)	1638	747	412	2139	1121	574	609
Starvation Cap Reductn	0	0	0	864	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.68	0.98	0.59	0.34	0.43	0.36

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	970	470	370	690	0	0	0	0	350	120	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	4.2	5.0					4.6	4.6	4.6
Lane Util. Factor		0.91	1.00	1.00	0.95					0.97	0.95	0.95
Frpb, ped/bikes		1.00	0.96	1.00	1.00					1.00	0.99	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00					0.99	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.93	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		5085	1516	1770	3539					3402	1626	1467
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		5085	1516	1770	3539					3402	1626	1467
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1054	511	402	750	0	0	0	0	380	130	337
RTOR Reduction (vph)	0	0	259	0	0	0	0	0	0	0	40	134
Lane Group Flow (vph)	0	1054	252	402	750	0	0	0	0	380	205	88
Confl. Peds. (#/hr)			10	10			10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		27.4	27.4	19.8	51.4					24.0	24.0	24.0
Effective Green, g (s)		27.4	27.4	19.8	51.4					24.0	24.0	24.0
Actuated g/C Ratio		0.32	0.32	0.23	0.60					0.28	0.28	0.28
Clearance Time (s)		5.0	5.0	4.2	5.0					4.6	4.6	4.6
Vehicle Extension (s)		0.2	0.2	0.2	0.2					0.2	0.2	0.2
Lane Grp Cap (vph)		1639	489	412	2140					961	459	414
v/s Ratio Prot		c0.21		c0.23	0.21						c0.13	
v/s Ratio Perm			0.17							0.11		0.06
v/c Ratio		0.64	0.52	0.98	0.35					0.40	0.45	0.21
Uniform Delay, d1		24.6	23.4	32.4	8.4					24.6	25.0	23.3
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		2.0	3.9	37.5	0.5					0.1	0.3	0.1
Delay (s)		26.6	27.3	69.8	8.9					24.7	25.3	23.4
Level of Service		C	C	E	A					C	C	C
Approach Delay (s)		26.8			30.2			0.0			24.5	
Approach LOS		C			C			A			C	

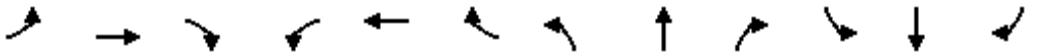
Intersection Summary			
HCM Average Control Delay	27.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	105.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	565	750	761	913	283	554
v/c Ratio	1.02	0.30	0.40	1.05	0.39	0.58
Control Delay	90.5	7.6	33.3	63.9	49.1	9.5
Queue Delay	232.3	1.7	1.0	45.8	0.0	0.0
Total Delay	322.8	9.3	34.3	109.7	49.1	9.5
Queue Length 50th (ft)	~544	118	186	~597	114	26
Queue Length 95th (ft)	#775	145	225	#858	159	86
Internal Link Dist (ft)		260	323			
Turn Bay Length (ft)				225	365	365
Base Capacity (vph)	554	2528	1889	870	725	952
Starvation Cap Reductn	193	1554	807	84	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.57	0.77	0.70	1.16	0.39	0.58

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	520	690	0	0	700	840	260	0	510	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.0			5.0	5.0	5.0		5.0			
Lane Util. Factor	1.00	0.95			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	0.94	1.00		0.95			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1770	3539			5085	1490	3385		2644			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1770	3539			5085	1490	3385		2644			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	565	750	0	0	761	913	283	0	554	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	316	0	0	385	0	0	0
Lane Group Flow (vph)	565	750	0	0	761	597	283	0	169	0	0	0
Confl. Peds. (#/hr)	10					10	10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6							
Permitted Phases						6	8		8			
Actuated Green, G (s)	43.8	100.0			52.0	52.0	30.0		30.0			
Effective Green, g (s)	43.8	100.0			52.0	52.0	30.0		30.0			
Actuated g/C Ratio	0.31	0.71			0.37	0.37	0.21		0.21			
Clearance Time (s)	4.2	5.0			5.0	5.0	5.0		5.0			
Vehicle Extension (s)	0.2	0.2			0.2	0.2	0.2		0.2			
Lane Grp Cap (vph)	554	2528			1889	553	725		567			
v/s Ratio Prot	c0.32	0.21			0.15							
v/s Ratio Perm						c0.40	c0.08		0.06			
v/c Ratio	1.02	0.30			0.40	1.08	0.39		0.30			
Uniform Delay, d1	48.1	7.3			32.5	44.0	47.2		46.2			
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00			
Incremental Delay, d2	43.3	0.3			0.6	61.4	1.6		1.3			
Delay (s)	91.4	7.6			33.2	105.4	48.7		47.5			
Level of Service	F	A			C	F	D		D			
Approach Delay (s)		43.6			72.6			47.9			0.0	
Approach LOS		D			E			D			A	

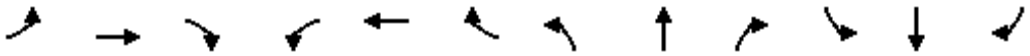
Intersection Summary			
HCM Average Control Delay	57.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	105.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	65	1163	22	1293	445	109
v/c Ratio	0.96	0.54	0.11	1.14	1.17	0.21
Control Delay	126.2	13.5	10.6	98.0	138.2	14.2
Queue Delay	0.0	3.8	0.0	100.8	0.0	0.0
Total Delay	126.2	17.2	10.6	198.9	138.2	14.2
Queue Length 50th (ft)	40	231	6	~1075	~375	22
Queue Length 95th (ft)	#89	287	18	#1337	#578	65
Internal Link Dist (ft)		323		304	593	79
Turn Bay Length (ft)	42		155			
Base Capacity (vph)	68	2136	206	1132	379	517
Starvation Cap Reductn	0	863	0	188	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.91	0.11	1.37	1.17	0.21

Intersection Summary

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

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



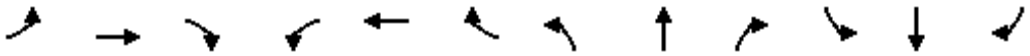
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	970	100	20	1150	40	350	20	40	20	20	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.99			0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1770	3489		1770	1853			1763			1696	
Flt Permitted	0.06	1.00		0.18	1.00			0.68			0.92	
Satd. Flow (perm)	111	3489		337	1853			1248			1567	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	1054	109	22	1250	43	380	22	43	22	22	65
RTOR Reduction (vph)	0	7	0	0	1	0	0	3	0	0	45	0
Lane Group Flow (vph)	65	1156	0	22	1292	0	0	442	0	0	64	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	67.1	67.1		67.1	67.1			33.1			33.1	
Effective Green, g (s)	67.1	67.1		67.1	67.1			33.1			33.1	
Actuated g/C Ratio	0.61	0.61		0.61	0.61			0.30			0.30	
Clearance Time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Vehicle Extension (s)	1.0	1.0		1.0	1.0			2.0			2.0	
Lane Grp Cap (vph)	68	2128		206	1130			376			472	
v/s Ratio Prot		0.33			c0.70							
v/s Ratio Perm	0.59			0.07				c0.35			0.04	
v/c Ratio	0.96	0.54		0.11	1.14			1.17			0.13	
Uniform Delay, d1	20.1	12.5		8.9	21.5			38.5			28.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	97.2	1.0		1.0	75.3			103.0			0.0	
Delay (s)	117.3	13.5		10.0	96.8			141.4			28.1	
Level of Service	F	B		A	F			F			C	
Approach Delay (s)		19.0			95.3			141.4			28.1	
Approach LOS		B			F			F			C	

Intersection Summary			
HCM Average Control Delay	69.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	100.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	43	870	43	967	250	217
v/c Ratio	0.32	0.40	0.13	0.85	0.58	0.65
Control Delay	17.4	9.3	9.1	23.3	26.1	32.4
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	17.4	9.6	9.1	23.3	26.1	32.4
Queue Length 50th (ft)	10	116	9	389	84	82
Queue Length 95th (ft)	39	156	25	#683	155	154
Internal Link Dist (ft)		304		883	602	1199
Turn Bay Length (ft)	150		150			
Base Capacity (vph)	133	2168	331	1140	486	381
Starvation Cap Reductn	0	691	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.59	0.13	0.85	0.51	0.57

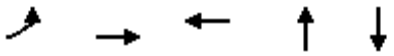
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	770	30	40	850	40	60	80	90	90	60	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.95			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1770	3519		1770	1850			1742			1760	
Flt Permitted	0.12	1.00		0.29	1.00			0.86			0.67	
Satd. Flow (perm)	216	3519		538	1850			1516			1215	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	837	33	43	924	43	65	87	98	98	65	54
RTOR Reduction (vph)	0	3	0	0	2	0	0	31	0	0	15	0
Lane Group Flow (vph)	43	867	0	43	965	0	0	219	0	0	202	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	49.2	49.2		49.2	49.2			21.0			21.0	
Effective Green, g (s)	49.2	49.2		49.2	49.2			21.0			21.0	
Actuated g/C Ratio	0.62	0.62		0.62	0.62			0.26			0.26	
Clearance Time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Vehicle Extension (s)	2.9	2.9		2.9	2.9			2.0			2.0	
Lane Grp Cap (vph)	133	2164		331	1138			398			319	
v/s Ratio Prot		0.25			c0.52							
v/s Ratio Perm	0.20			0.08				0.14			c0.17	
v/c Ratio	0.32	0.40		0.13	0.85			0.55			0.63	
Uniform Delay, d1	7.4	7.9		6.4	12.4			25.4			26.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	6.3	0.6		0.8	7.9			0.9			3.0	
Delay (s)	13.7	8.4		7.3	20.3			26.4			29.1	
Level of Service	B	A		A	C			C			C	
Approach Delay (s)		8.7			19.7			26.4			29.1	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	87	1500	1413	184	141
v/c Ratio	0.94	0.56	0.75	0.34	0.27
Control Delay	117.7	15.2	26.7	17.2	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	117.7	15.2	26.7	17.2	14.8
Queue Length 50th (ft)	44	197	241	53	37
Queue Length 95th (ft)	#134	245	#326	100	75
Internal Link Dist (ft)		109	1248	382	134
Turn Bay Length (ft)	100				
Base Capacity (vph)	93	2679	1897	649	610
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.94	0.56	0.74	0.28	0.23

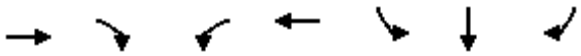
Intersection Summary

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

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	30	50	1300	80	0	1210	90	50	50	70	60	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.4	4.9			4.9			4.9			4.9
Lane Util. Factor		1.00	0.91			0.91			1.00			1.00
Frt		1.00	0.99			0.99			0.94			0.97
Flt Protected		0.95	1.00			1.00			0.99			0.98
Satd. Flow (prot)		1770	5041			5032			1733			1763
Flt Permitted		0.50	1.00			1.00			0.88			0.80
Satd. Flow (perm)		931	5041			5032			1550			1447
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	54	1413	87	0	1315	98	54	54	76	65	43
RTOR Reduction (vph)	0	0	8	0	0	9	0	0	11	0	0	15
Lane Group Flow (vph)	0	87	1492	0	0	1404	0	0	173	0	0	126
Turn Type	custom	Prot						Perm			Perm	
Protected Phases		5	2			6			8			4
Permitted Phases	5							8			4	
Actuated Green, G (s)		8.0	42.4			30.0			27.8			27.8
Effective Green, g (s)		8.0	42.4			30.0			27.8			27.8
Actuated g/C Ratio		0.10	0.53			0.38			0.35			0.35
Clearance Time (s)		4.4	4.9			4.9			4.9			4.9
Vehicle Extension (s)		2.0	1.0			1.0			2.0			2.0
Lane Grp Cap (vph)		93	2672			1887			539			503
v/s Ratio Prot			0.30			c0.28						
v/s Ratio Perm		c0.09							c0.11			0.09
v/c Ratio		0.94	0.56			0.74			0.32			0.25
Uniform Delay, d1		35.7	12.6			21.7			19.2			18.7
Progression Factor		1.00	1.00			1.00			1.00			1.00
Incremental Delay, d2		71.1	0.8			2.7			0.1			0.1
Delay (s)		106.9	13.4			24.4			19.3			18.7
Level of Service		F	B			C			B			B
Approach Delay (s)			18.5			24.4			19.3			18.7
Approach LOS			B			C			B			B

Intersection Summary			
HCM Average Control Delay	21.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	33
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

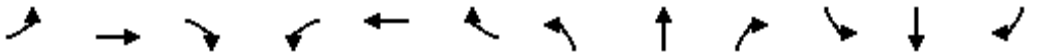


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	2152	413	696	1315	739	393	357
v/c Ratio	1.11	0.77	1.09	0.37	0.93	0.98	0.87
Control Delay	102.7	43.5	106.8	9.6	73.0	90.6	62.3
Queue Delay	0.0	0.0	288.1	3.2	0.0	0.0	0.0
Total Delay	102.7	43.5	394.9	12.9	73.0	90.6	62.3
Queue Length 50th (ft)	~671	263	~739	173	355	369	269
Queue Length 95th (ft)	#744	404	#984	199	#473	#598	#460
Internal Link Dist (ft)	1248			230		598	
Turn Bay Length (ft)		100			200		
Base Capacity (vph)	1944	533	637	3521	795	402	409
Starvation Cap Reductn	0	0	238	2070	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.77	1.74	0.91	0.93	0.98	0.87

Intersection Summary

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

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



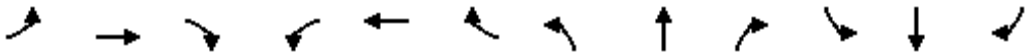
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1980	380	640	1210	0	0	0	0	680	200	490
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	4.2	5.0					5.6	5.6	5.6
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97	0.95	0.95
Frpb, ped/bikes		1.00	0.94	1.00	1.00					1.00	0.99	0.97
Flpb, ped/bikes		1.00	1.00	1.00	1.00					0.99	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.93	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		6408	1486	1770	5085					3389	1629	1460
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		6408	1486	1770	5085					3389	1629	1460
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2152	413	696	1315	0	0	0	0	739	217	533
RTOR Reduction (vph)	0	0	82	0	0	0	0	0	0	0	20	67
Lane Group Flow (vph)	0	2152	331	696	1315	0	0	0	0	739	373	290
Confl. Peds. (#/hr)			10	10			10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		44.0	44.0	52.2	100.4					34.0	34.0	34.0
Effective Green, g (s)		44.0	44.0	52.2	100.4					34.0	34.0	34.0
Actuated g/C Ratio		0.30	0.30	0.36	0.69					0.23	0.23	0.23
Clearance Time (s)		5.0	5.0	4.2	5.0					5.6	5.6	5.6
Vehicle Extension (s)		0.2	0.2	0.2	0.2					0.2	0.2	0.2
Lane Grp Cap (vph)		1944	451	637	3521					795	382	342
v/s Ratio Prot		c0.34		c0.39	0.26						c0.23	
v/s Ratio Perm			0.22							0.22		0.20
v/c Ratio		1.11	0.73	1.09	0.37					0.93	0.98	0.85
Uniform Delay, d1		50.5	45.2	46.4	9.3					54.3	55.1	53.0
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		56.3	10.1	63.5	0.3					18.8	40.6	22.3
Delay (s)		106.8	55.4	109.9	9.6					73.1	95.7	75.3
Level of Service		F	E	F	A					E	F	E
Approach Delay (s)		98.5			44.3			0.0			79.6	
Approach LOS		F			D			A			E	

Intersection Summary			
HCM Average Control Delay	75.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	129.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	380	2446	1630	663	250	379	371
v/c Ratio	0.98	0.82	0.78	0.94	0.24	0.79	0.81
Control Delay	82.4	21.2	35.8	41.6	26.5	45.5	47.2
Queue Delay	56.0	88.2	0.0	0.0	0.0	0.0	0.0
Total Delay	138.4	109.4	35.8	41.6	26.5	45.5	47.2
Queue Length 50th (ft)	256	486	298	268	60	230	227
Queue Length 95th (ft)	#448	563	346	#522	91	351	349
Internal Link Dist (ft)		230	588			231	
Turn Bay Length (ft)				90	140		
Base Capacity (vph)	389	2989	2102	707	1167	525	505
Starvation Cap Reductn	57	941	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	1.19	0.78	0.94	0.21	0.72	0.73

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	350	2250	0	0	1500	610	230	70	620	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.0			5.0	5.0	5.6	5.6	5.6			
Lane Util. Factor	1.00	0.91			0.86	1.00	0.97	0.95	0.95			
Frpb, ped/bikes	1.00	1.00			1.00	0.95	1.00	0.98	0.98			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	0.99	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	5085			6408	1510	3403	1527	1468			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	5085			6408	1510	3403	1527	1468			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	380	2446	0	0	1630	663	250	76	674	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	212	0	1	1	0	0	0
Lane Group Flow (vph)	380	2446	0	0	1630	451	250	378	370	0	0	0
Confl. Peds. (#/hr)	10					10	10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	5	2			6			8				
Permitted Phases						6	8		8			
Actuated Green, G (s)	23.1	61.7			34.4	34.4	32.7	32.7	32.7			
Effective Green, g (s)	23.1	61.7			34.4	34.4	32.7	32.7	32.7			
Actuated g/C Ratio	0.22	0.59			0.33	0.33	0.31	0.31	0.31			
Clearance Time (s)	4.2	5.0			5.0	5.0	5.6	5.6	5.6			
Vehicle Extension (s)	0.2	0.2			0.2	0.2	0.2	0.2	0.2			
Lane Grp Cap (vph)	389	2988			2099	495	1060	476	457			
v/s Ratio Prot	c0.21	0.48			0.25			0.25				
v/s Ratio Perm						c0.30	0.07		c0.25			
v/c Ratio	0.98	0.82			0.78	0.91	0.24	0.79	0.81			
Uniform Delay, d1	40.7	17.2			31.8	33.8	26.9	33.1	33.3			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	39.0	2.6			2.9	23.5	0.0	8.3	9.6			
Delay (s)	79.7	19.8			34.7	57.4	26.9	41.3	42.9			
Level of Service	E	B			C	E	C	D	D			
Approach Delay (s)		27.9			41.3			38.3			0.0	
Approach LOS		C			D			D			A	

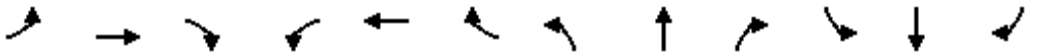
Intersection Summary			
HCM Average Control Delay	34.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	129.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	207	1967	98	1532	260	151
v/c Ratio	0.87	0.90	0.77	0.81	0.59	0.31
Control Delay	69.9	29.7	74.9	28.7	26.2	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.9	29.7	74.9	28.7	26.2	16.9
Queue Length 50th (ft)	103	~349	49	267	92	42
Queue Length 95th (ft)	#220	#475	#130	#366	165	86
Internal Link Dist (ft)		588		574	300	317
Turn Bay Length (ft)	95		90			
Base Capacity (vph)	241	2195	127	1889	501	562
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.90	0.77	0.81	0.52	0.27

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	1690	120	90	1350	60	140	50	50	50	50	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9			4.9			4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.97			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	
Satd. Flow (prot)	1770	5035		1770	5053			1759			1760	
Flt Permitted	0.95	1.00		0.95	1.00			0.74			0.83	
Satd. Flow (perm)	1770	5035		1770	5053			1343			1496	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	207	1837	130	98	1467	65	152	54	54	54	54	43
RTOR Reduction (vph)	0	9	0	0	6	0	0	13	0	0	19	0
Lane Group Flow (vph)	207	1958	0	98	1526	0	0	247	0	0	132	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	10.7	34.7		5.8	29.8			25.3			25.3	
Effective Green, g (s)	10.7	34.7		5.8	29.8			25.3			25.3	
Actuated g/C Ratio	0.13	0.43		0.07	0.37			0.32			0.32	
Clearance Time (s)	4.4	4.9		4.4	4.9			4.9			4.9	
Vehicle Extension (s)	2.0	3.2		2.0	3.2			2.0			2.0	
Lane Grp Cap (vph)	237	2184		128	1882			425			473	
v/s Ratio Prot	c0.12	c0.39		0.06	0.30							
v/s Ratio Perm								c0.18			0.09	
v/c Ratio	0.87	0.90		0.77	0.81			0.58			0.28	
Uniform Delay, d1	34.0	21.0		36.4	22.6			22.9			20.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	27.2	6.3		21.4	3.9			1.3			0.1	
Delay (s)	61.2	27.3		57.8	26.5			24.2			20.6	
Level of Service	E	C		E	C			C			C	
Approach Delay (s)		30.5			28.4			24.2			20.6	
Approach LOS		C			C			C			C	

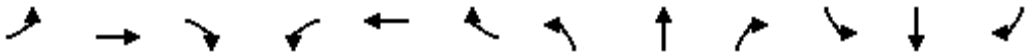
Intersection Summary			
HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	9.3
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	54	967	65	1011	261	65	217	337	196
v/c Ratio	0.57	0.94	0.69	0.97	0.26	0.18	0.35	1.01	0.33
Control Delay	41.7	34.6	55.8	41.7	1.9	21.5	11.2	81.2	18.0
Queue Delay	0.0	0.0	0.0	87.2	0.0	0.0	0.0	0.0	0.0
Total Delay	41.7	34.6	55.8	128.9	1.9	21.5	11.2	81.2	18.0
Queue Length 50th (ft)	16	410	22	450	0	23	34	~171	57
Queue Length 95th (ft)	#79	#701	#97	#745	30	54	87	#337	110
Internal Link Dist (ft)		289		315			568		302
Turn Bay Length (ft)	150		150			100		230	
Base Capacity (vph)	94	1036	94	1041	1000	354	618	335	591
Starvation Cap Reductn	0	0	0	204	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.93	0.69	1.21	0.26	0.18	0.35	1.01	0.33

Intersection Summary

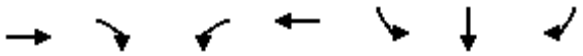
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	850	40	60	930	240	60	60	140	310	110	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.89		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1850		1770	1863	1583	1770	1667		1770	1754	
Flt Permitted	0.09	1.00		0.09	1.00	1.00	0.59	1.00		0.56	1.00	
Satd. Flow (perm)	167	1850		167	1863	1583	1102	1667		1045	1754	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	924	43	65	1011	261	65	65	152	337	120	76
RTOR Reduction (vph)	0	2	0	0	0	116	0	83	0	0	29	0
Lane Group Flow (vph)	54	965	0	65	1011	145	65	134	0	337	167	0
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	44.5	44.5		44.5	44.5	44.5	25.7	25.7		25.7	25.7	
Effective Green, g (s)	44.5	44.5		44.5	44.5	44.5	25.7	25.7		25.7	25.7	
Actuated g/C Ratio	0.56	0.56		0.56	0.56	0.56	0.32	0.32		0.32	0.32	
Clearance Time (s)	4.9	4.9		4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Vehicle Extension (s)	4.2	4.2		4.2	4.2	4.2	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	93	1029		93	1036	881	354	536		336	563	
v/s Ratio Prot		0.52			c0.54			0.08			0.10	
v/s Ratio Perm	0.32			0.39		0.09	0.06			c0.32		
v/c Ratio	0.58	0.94		0.70	0.98	0.16	0.18	0.25		1.00	0.30	
Uniform Delay, d1	11.6	16.5		12.9	17.2	8.7	19.6	20.0		27.1	20.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	23.8	16.5		35.6	22.7	0.4	0.1	0.1		49.8	0.1	
Delay (s)	35.4	33.0		48.5	40.0	9.1	19.7	20.1		77.0	20.5	
Level of Service	D	C		D	D	A	B	C		E	C	
Approach Delay (s)		33.1			34.3			20.0			56.2	
Approach LOS		C			C			C			E	

Intersection Summary			
HCM Average Control Delay	36.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	91.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

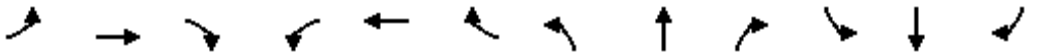


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1185	500	533	902	696	399	351
v/c Ratio	0.84	0.93	0.98	0.41	0.76	0.84	0.69
Control Delay	39.4	49.5	69.7	10.0	37.3	48.5	24.3
Queue Delay	0.0	0.0	79.4	1.1	0.0	0.0	0.0
Total Delay	39.4	49.5	149.1	11.0	37.3	48.5	24.3
Queue Length 50th (ft)	251	214	~329	140	191	225	107
Queue Length 95th (ft)	#329	#423	#540	181	254	#373	212
Internal Link Dist (ft)	315			260		545	
Turn Bay Length (ft)		95			250		
Base Capacity (vph)	1412	538	542	2223	1002	515	540
Starvation Cap Reductn	0	0	98	999	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.93	1.20	0.74	0.69	0.77	0.65

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1090	460	490	830	0	0	0	0	640	310	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	4.2	5.0					4.6	4.6	4.6
Lane Util. Factor		0.91	1.00	1.00	0.95					0.97	0.95	0.95
Frpb, ped/bikes		1.00	0.95	1.00	1.00					1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00	1.00	1.00					0.99	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.98	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		5085	1512	1770	3539					3398	1721	1465
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		5085	1512	1770	3539					3398	1721	1465
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1185	500	533	902	0	0	0	0	696	337	413
RTOR Reduction (vph)	0	0	118	0	0	0	0	0	0	0	7	112
Lane Group Flow (vph)	0	1185	382	533	902	0	0	0	0	696	392	239
Confl. Peds. (#/hr)			10	10			10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		26.4	26.4	29.1	59.7					25.7	25.7	25.7
Effective Green, g (s)		26.4	26.4	29.1	59.7					25.7	25.7	25.7
Actuated g/C Ratio		0.28	0.28	0.31	0.63					0.27	0.27	0.27
Clearance Time (s)		5.0	5.0	4.2	5.0					4.6	4.6	4.6
Vehicle Extension (s)		0.2	0.2	0.2	0.2					0.2	0.2	0.2
Lane Grp Cap (vph)		1413	420	542	2224					919	466	396
v/s Ratio Prot		0.23		c0.30	0.25						c0.23	
v/s Ratio Perm			c0.25							0.20		0.16
v/c Ratio		0.84	0.91	0.98	0.41					0.76	0.84	0.60
Uniform Delay, d1		32.3	33.2	32.7	8.8					31.8	32.7	30.2
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		6.1	26.3	34.1	0.6					3.2	12.4	1.8
Delay (s)		38.4	59.5	66.8	9.4					35.0	45.1	32.0
Level of Service		D	E	E	A					C	D	C
Approach Delay (s)		44.7			30.7			0.0			37.1	
Approach LOS		D			C			A			D	

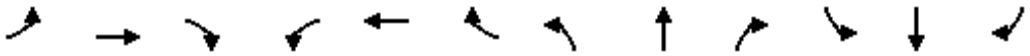
Intersection Summary			
HCM Average Control Delay	37.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	119.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	337	1424	924	630	380	772
v/c Ratio	0.97	0.77	0.66	0.72	0.31	0.79
Control Delay	76.1	19.6	29.0	7.9	18.8	28.1
Queue Delay	0.0	22.5	0.0	0.0	0.0	0.0
Total Delay	76.1	42.1	29.0	7.9	18.8	28.1
Queue Length 50th (ft)	~174	301	154	0	65	173
Queue Length 95th (ft)	#338	393	199	95	97	247
Internal Link Dist (ft)		260	323			
Turn Bay Length (ft)				225	365	365
Base Capacity (vph)	348	1855	1398	872	1320	1063
Starvation Cap Reductn	0	479	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.97	1.03	0.66	0.72	0.29	0.73

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	310	1310	0	0	850	580	350	0	710	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.0			5.0	5.0	4.6		4.6			
Lane Util. Factor	1.00	0.95			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	0.95	1.00		0.96			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1770	3539			5085	1510	3406		2681			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1770	3539			5085	1510	3406		2681			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	337	1424	0	0	924	630	380	0	772	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	457	0	0	24	0	0	0
Lane Group Flow (vph)	337	1424	0	0	924	173	380	0	748	0	0	0
Confl. Peds. (#/hr)	10					10	10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6							
Permitted Phases						6	8		8			
Actuated Green, G (s)	15.7	41.9			22.0	22.0	28.5		28.5			
Effective Green, g (s)	15.7	41.9			22.0	22.0	28.5		28.5			
Actuated g/C Ratio	0.20	0.52			0.28	0.28	0.36		0.36			
Clearance Time (s)	4.2	5.0			5.0	5.0	4.6		4.6			
Vehicle Extension (s)	0.2	0.2			0.2	0.2	0.2		0.2			
Lane Grp Cap (vph)	347	1854			1398	415	1213		955			
v/s Ratio Prot	c0.19	c0.40			0.18							
v/s Ratio Perm						0.11	0.11		c0.28			
v/c Ratio	0.97	0.77			0.66	0.42	0.31		0.78			
Uniform Delay, d1	31.9	15.2			25.7	23.8	18.7		23.0			
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00			
Incremental Delay, d2	40.3	3.1			2.5	3.1	0.1		3.9			
Delay (s)	72.2	18.3			28.2	26.8	18.7		26.9			
Level of Service	E	B			C	C	B		C			
Approach Delay (s)		28.6			27.6			24.2			0.0	
Approach LOS		C			C			C			A	

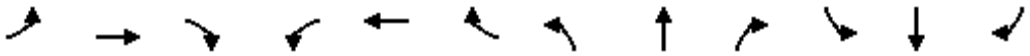
Intersection Summary			
HCM Average Control Delay	27.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	119.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	43	1957	22	1261	402	65
v/c Ratio	0.63	0.88	0.32	1.06	1.06	0.14
Control Delay	58.1	22.3	24.6	66.2	102.0	14.5
Queue Delay	0.0	85.3	0.0	104.4	0.0	0.0
Total Delay	58.1	107.6	24.6	170.6	102.0	14.5
Queue Length 50th (ft)	17	546	7	~985	~310	12
Queue Length 95th (ft)	#90	678	31	#1248	#505	46
Internal Link Dist (ft)		323		304	593	79
Turn Bay Length (ft)	42		155			
Base Capacity (vph)	68	2223	68	1186	379	467
Starvation Cap Reductn	0	577	0	219	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	1.19	0.32	1.30	1.06	0.14

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	1570	230	20	1150	10	310	10	50	10	10	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	1.00			0.98			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1770	3471		1770	1860			1755			1682	
Flt Permitted	0.06	1.00		0.06	1.00			0.75			0.94	
Satd. Flow (perm)	106	3471		106	1860			1366			1592	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1707	250	22	1250	11	337	11	54	11	11	43
RTOR Reduction (vph)	0	11	0	0	0	0	0	5	0	0	31	0
Lane Group Flow (vph)	43	1946	0	22	1261	0	0	397	0	0	34	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	70.1	70.1		70.1	70.1			30.1			30.1	
Effective Green, g (s)	70.1	70.1		70.1	70.1			30.1			30.1	
Actuated g/C Ratio	0.64	0.64		0.64	0.64			0.27			0.27	
Clearance Time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Vehicle Extension (s)	1.0	1.0		1.0	1.0			2.0			2.0	
Lane Grp Cap (vph)	68	2212		68	1185			374			436	
v/s Ratio Prot		0.56			c0.68							
v/s Ratio Perm	0.40			0.21				c0.29			0.02	
v/c Ratio	0.63	0.88		0.32	1.06			1.06			0.08	
Uniform Delay, d1	12.1	16.5		9.1	20.0			40.0			29.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	37.2	5.4		12.2	44.9			63.7			0.0	
Delay (s)	49.3	21.9		21.3	64.9			103.6			29.7	
Level of Service	D	C		C	E			F			C	
Approach Delay (s)		22.5			64.1			103.6			29.7	
Approach LOS		C			E			F			C	

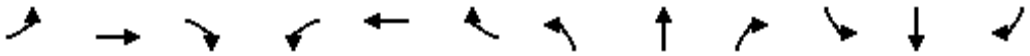
Intersection Summary			
HCM Average Control Delay	45.6	HCM Level of Service	D
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	54	1848	65	1293	305	316
v/c Ratio	0.72	0.81	0.87	1.08	1.06	0.83
Control Delay	66.7	16.6	95.9	69.2	106.7	52.3
Queue Delay	0.0	53.9	0.0	0.0	0.0	0.0
Total Delay	66.7	70.4	95.9	69.2	106.7	52.3
Queue Length 50th (ft)	21	412	30	~926	~208	174
Queue Length 95th (ft)	#102	518	#78	#1184	#377	#323
Internal Link Dist (ft)		304		883	602	1199
Turn Bay Length (ft)	150		150			
Base Capacity (vph)	75	2281	75	1200	287	379
Starvation Cap Reductn	0	624	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	1.12	0.87	1.08	1.06	0.83

Intersection Summary

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

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

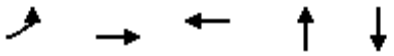


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1600	100	60	1120	70	110	100	70	70	110	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.97			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1770	3508		1770	1846			1765			1746	
Flt Permitted	0.06	1.00		0.06	1.00			0.60			0.80	
Satd. Flow (perm)	115	3508		115	1846			1087			1408	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1739	109	65	1217	76	120	109	76	76	120	120
RTOR Reduction (vph)	0	5	0	0	2	0	0	12	0	0	22	0
Lane Group Flow (vph)	54	1843	0	65	1291	0	0	293	0	0	294	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	64.9	64.9		64.9	64.9			25.3			25.3	
Effective Green, g (s)	64.9	64.9		64.9	64.9			25.3			25.3	
Actuated g/C Ratio	0.65	0.65		0.65	0.65			0.25			0.25	
Clearance Time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Vehicle Extension (s)	2.9	2.9		2.9	2.9			2.0			2.0	
Lane Grp Cap (vph)	75	2277		75	1198			275			356	
v/s Ratio Prot		0.53			c0.70							
v/s Ratio Perm	0.47			0.57				c0.27			0.21	
v/c Ratio	0.72	0.81		0.87	1.08			1.07			0.82	
Uniform Delay, d1	11.6	13.0		14.1	17.5			37.4			35.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	45.4	3.2		71.3	49.6			72.7			13.7	
Delay (s)	56.9	16.2		85.4	67.1			110.1			49.0	
Level of Service	E	B		F	E			F			D	
Approach Delay (s)		17.4			68.0			110.1			49.0	
Approach LOS		B			E			F			D	

Intersection Summary			
HCM Average Control Delay	44.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Appendix F

2035 Proposed Land Uses Scenario – Synchro Sheets (Intersection & Queue)



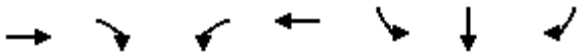
Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	33	685	826	173	142
v/c Ratio	0.22	0.26	0.35	0.29	0.28
Control Delay	37.2	11.9	17.0	11.4	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	11.9	17.0	11.4	14.9
Queue Length 50th (ft)	16	72	91	35	37
Queue Length 95th (ft)	41	97	159	75	76
Internal Link Dist (ft)		109	1248	382	134
Turn Bay Length (ft)	100				
Base Capacity (vph)	179	2682	2380	689	600
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.18	0.26	0.35	0.25	0.24

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	20	600	30	0	730	30	40	50	70	70	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.4	4.9			4.9			4.9			4.9
Lane Util. Factor		1.00	0.91			0.91			1.00			1.00
Frt		1.00	0.99			0.99			0.94			0.97
Flt Protected		0.95	1.00			1.00			0.99			0.97
Satd. Flow (prot)		1770	5049			5055			1731			1757
Flt Permitted		1.00	1.00			1.00			0.90			0.79
Satd. Flow (perm)		1863	5049			5055			1584			1420
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	22	652	33	0	793	33	43	54	76	76	33
RTOR Reduction (vph)	0	0	6	0	0	5	0	0	39	0	0	15
Lane Group Flow (vph)	0	33	679	0	0	821	0	0	134	0	0	127
Turn Type	custom	Prot						Perm			Perm	
Protected Phases		5	2			6			8			4
Permitted Phases	5							8			4	
Actuated Green, G (s)		3.1	42.4			34.9			27.8			27.8
Effective Green, g (s)		3.1	42.4			34.9			27.8			27.8
Actuated g/C Ratio		0.04	0.53			0.44			0.35			0.35
Clearance Time (s)		4.4	4.9			4.9			4.9			4.9
Vehicle Extension (s)		2.0	1.0			1.0			2.0			2.0
Lane Grp Cap (vph)		72	2676			2205			550			493
v/s Ratio Prot			0.13			c0.16						
v/s Ratio Perm		c0.02							0.08			c0.09
v/c Ratio		0.46	0.25			0.37			0.24			0.26
Uniform Delay, d1		37.6	10.2			15.2			18.6			18.7
Progression Factor		1.00	1.00			1.00			1.00			1.00
Incremental Delay, d2		1.7	0.2			0.5			0.1			0.1
Delay (s)		39.3	10.4			15.7			18.7			18.8
Level of Service		D	B			B			B			B
Approach Delay (s)			11.8			15.7			18.7			18.8
Approach LOS			B			B			B			B

Intersection Summary			
HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	33
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

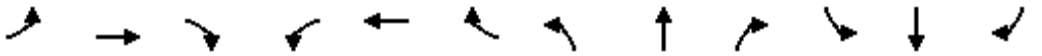


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	978	348	609	1130	380	200	180
v/c Ratio	0.79	0.69	1.01	0.39	0.35	0.36	0.34
Control Delay	45.5	18.8	74.7	12.7	28.1	25.5	16.7
Queue Delay	0.0	0.0	184.0	1.4	0.0	0.0	0.0
Total Delay	45.5	18.8	258.7	14.1	28.1	25.5	16.7
Queue Length 50th (ft)	183	51	~413	142	99	91	50
Queue Length 95th (ft)	222	155	#646	173	139	157	111
Internal Link Dist (ft)	1248			230		598	
Turn Bay Length (ft)		100			200		
Base Capacity (vph)	1245	501	603	2925	1101	557	529
Starvation Cap Reductn	0	0	183	1522	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.69	1.45	0.81	0.35	0.36	0.34

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	900	320	560	1040	0	0	0	0	350	120	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	4.2	5.0					5.6	5.6	5.6
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97	0.95	0.95
Frpb, ped/bikes		1.00	0.94	1.00	1.00					1.00	0.99	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00					0.99	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.95	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		6408	1496	1770	5085					3401	1662	1467
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		6408	1496	1770	5085					3401	1662	1467
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	978	348	609	1130	0	0	0	0	380	130	250
RTOR Reduction (vph)	0	0	210	0	0	0	0	0	0	0	18	54
Lane Group Flow (vph)	0	978	138	609	1130	0	0	0	0	380	182	126
Confl. Peds. (#/hr)			10	10			10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		20.4	20.4	35.8	60.4					34.0	34.0	34.0
Effective Green, g (s)		20.4	20.4	35.8	60.4					34.0	34.0	34.0
Actuated g/C Ratio		0.19	0.19	0.34	0.58					0.32	0.32	0.32
Clearance Time (s)		5.0	5.0	4.2	5.0					5.6	5.6	5.6
Vehicle Extension (s)		0.2	0.2	0.2	0.2					0.2	0.2	0.2
Lane Grp Cap (vph)		1245	291	603	2925					1101	538	475
v/s Ratio Prot		c0.15		c0.34	0.22						0.11	
v/s Ratio Perm			0.09							c0.11		0.09
v/c Ratio		0.79	0.47	1.01	0.39					0.35	0.34	0.27
Uniform Delay, d1		40.2	37.5	34.6	12.2					27.0	27.0	26.3
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		5.0	5.4	39.1	0.4					0.9	1.7	1.4
Delay (s)		45.3	43.0	73.7	12.6					27.9	28.7	27.6
Level of Service		D	D	E	B					C	C	C
Approach Delay (s)		44.7			34.0			0.0			28.0	
Approach LOS		D			C			A			C	

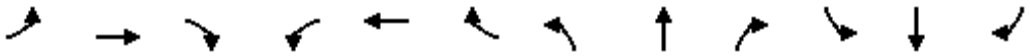
Intersection Summary			
HCM Average Control Delay	36.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	402	1000	1511	772	217	341	333
v/c Ratio	0.98	0.31	0.64	0.97	0.24	0.70	0.69
Control Delay	84.8	10.7	32.5	44.9	32.0	31.2	30.8
Queue Delay	99.6	0.6	0.0	0.0	0.0	0.0	0.0
Total Delay	184.4	11.3	32.5	44.9	32.0	31.2	30.8
Queue Length 50th (ft)	~302	128	282	~408	60	147	142
Queue Length 95th (ft)	#506	155	326	#648	91	255	248
Internal Link Dist (ft)		230	588			231	
Turn Bay Length (ft)				90	140		
Base Capacity (vph)	410	3250	2379	798	1064	549	540
Starvation Cap Reductn	88	1718	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.25	0.65	0.64	0.97	0.20	0.62	0.62

Intersection Summary

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

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



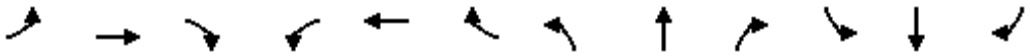
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	920	0	0	1390	710	200	30	590	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.0			5.0	5.0	5.6	5.6	5.6			
Lane Util. Factor	1.00	0.91			0.86	1.00	0.97	0.95	0.95			
Frpb, ped/bikes	1.00	1.00			1.00	0.95	1.00	0.98	0.97			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	0.99	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	5085			6408	1508	3400	1495	1466			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	5085			6408	1508	3400	1495	1466			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	402	1000	0	0	1511	772	217	33	641	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	238	0	86	86	0	0	0
Lane Group Flow (vph)	402	1000	0	0	1511	534	217	255	247	0	0	0
Confl. Peds. (#/hr)	10					10	10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	5	2			6			8				
Permitted Phases						6	8		8			
Actuated Green, G (s)	26.6	73.5			42.7	42.7	30.9	30.9	30.9			
Effective Green, g (s)	26.6	73.5			42.7	42.7	30.9	30.9	30.9			
Actuated g/C Ratio	0.23	0.64			0.37	0.37	0.27	0.27	0.27			
Clearance Time (s)	4.2	5.0			5.0	5.0	5.6	5.6	5.6			
Vehicle Extension (s)	0.2	0.2			0.2	0.2	0.2	0.2	0.2			
Lane Grp Cap (vph)	409	3250			2379	560	914	402	394			
v/s Ratio Prot	c0.23	0.20			0.24			c0.17				
v/s Ratio Perm						c0.35	0.06		0.17			
v/c Ratio	0.98	0.31			0.64	0.95	0.24	0.63	0.63			
Uniform Delay, d1	44.0	9.3			29.7	35.2	32.8	37.1	37.0			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	39.6	0.2			1.3	28.0	0.0	2.4	2.2			
Delay (s)	83.6	9.6			31.0	63.2	32.9	39.5	39.2			
Level of Service	F	A			C	E	C	D	D			
Approach Delay (s)		30.8			41.9			37.8			0.0	
Approach LOS		C			D			D			A	

Intersection Summary			
HCM Average Control Delay	37.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	120	1011	33	1348	196	120
v/c Ratio	0.70	0.40	0.25	0.62	0.47	0.24
Control Delay	55.1	14.8	35.4	21.3	19.4	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.1	14.8	35.4	21.3	19.4	9.6
Queue Length 50th (ft)	51	104	14	204	50	17
Queue Length 95th (ft)	#129	178	39	#293	97	46
Internal Link Dist (ft)		588		574	300	317
Turn Bay Length (ft)	95		90			
Base Capacity (vph)	175	2547	139	2176	572	674
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.40	0.24	0.62	0.34	0.18

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	900	30	30	1210	30	130	20	30	30	30	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9			4.9			4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.98			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1770	5060		1770	5067			1757			1726	
Flt Permitted	0.95	1.00		0.95	1.00			0.75			0.89	
Satd. Flow (perm)	1770	5060		1770	5067			1357			1551	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	978	33	33	1315	33	141	22	33	33	33	54
RTOR Reduction (vph)	0	4	0	0	3	0	0	13	0	0	38	0
Lane Group Flow (vph)	120	1007	0	33	1345	0	0	183	0	0	82	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	5.6	32.5		2.2	29.1			21.1			21.1	
Effective Green, g (s)	5.6	32.5		2.2	29.1			21.1			21.1	
Actuated g/C Ratio	0.08	0.46		0.03	0.42			0.30			0.30	
Clearance Time (s)	4.4	4.9		4.4	4.9			4.9			4.9	
Vehicle Extension (s)	2.0	3.2		2.0	3.2			2.0			2.0	
Lane Grp Cap (vph)	142	2349		56	2106			409			468	
v/s Ratio Prot	c0.07	c0.20		0.02	c0.27							
v/s Ratio Perm								c0.14			0.05	
v/c Ratio	0.85	0.43		0.59	0.64			0.45			0.18	
Uniform Delay, d1	31.8	12.5		33.5	16.3			19.7			18.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	33.3	0.6		9.8	1.5			0.3			0.1	
Delay (s)	65.1	13.1		43.3	17.8			20.0			18.1	
Level of Service	E	B		D	B			C			B	
Approach Delay (s)		18.6			18.4			20.0			18.1	
Approach LOS		B			B			C			B	

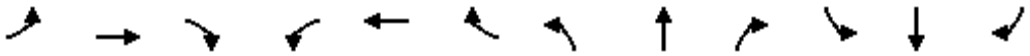
Intersection Summary			
HCM Average Control Delay	18.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	22	913	65	609	380	76	305	326	163
v/c Ratio	0.09	0.97	0.65	0.65	0.38	0.17	0.45	1.02	0.24
Control Delay	10.8	43.9	49.5	17.7	2.5	17.6	13.8	82.1	11.1
Queue Delay	0.0	0.0	0.0	3.3	0.2	0.0	0.0	0.0	0.0
Total Delay	10.8	43.9	49.5	20.9	2.7	17.6	13.8	82.1	11.1
Queue Length 50th (ft)	5	387	21	196	0	23	64	~154	30
Queue Length 95th (ft)	17	#657	#90	304	39	53	131	#314	70
Internal Link Dist (ft)		289		315			568		302
Turn Bay Length (ft)	150		150			100		230	
Base Capacity (vph)	257	938	100	941	988	443	678	321	672
Starvation Cap Reductn	0	0	0	231	162	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.97	0.65	0.86	0.46	0.17	0.45	1.02	0.24

Intersection Summary

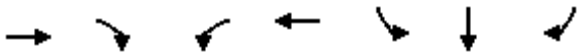
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	810	30	60	560	350	70	90	190	300	80	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.90		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1853		1770	1863	1583	1770	1673		1770	1732	
Flt Permitted	0.27	1.00		0.11	1.00	1.00	0.65	1.00		0.47	1.00	
Satd. Flow (perm)	508	1853		197	1863	1583	1218	1673		881	1732	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	880	33	65	609	380	76	98	207	326	87	76
RTOR Reduction (vph)	0	2	0	0	0	188	0	69	0	0	42	0
Lane Group Flow (vph)	22	911	0	65	609	192	76	236	0	326	121	0
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	37.9	37.9		37.9	37.9	37.9	27.3	27.3		27.3	27.3	
Effective Green, g (s)	37.9	37.9		37.9	37.9	37.9	27.3	27.3		27.3	27.3	
Actuated g/C Ratio	0.51	0.51		0.51	0.51	0.51	0.36	0.36		0.36	0.36	
Clearance Time (s)	4.9	4.9		4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Vehicle Extension (s)	4.2	4.2		4.2	4.2	4.2	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	257	936		100	941	800	443	609		321	630	
v/s Ratio Prot		c0.49			0.33			0.14			0.07	
v/s Ratio Perm	0.04			0.33		0.12	0.06			c0.37		
v/c Ratio	0.09	0.97		0.65	0.65	0.24	0.17	0.39		1.02	0.19	
Uniform Delay, d1	9.6	18.1		13.7	13.6	10.4	16.2	17.7		23.9	16.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	23.6		28.3	3.4	0.7	0.1	0.1		54.2	0.1	
Delay (s)	10.2	41.7		42.0	17.1	11.2	16.2	17.8		78.1	16.4	
Level of Service	B	D		D	B	B	B	B		E	B	
Approach Delay (s)		41.0			16.5			17.5			57.5	
Approach LOS		D			B			B			E	

Intersection Summary			
HCM Average Control Delay	31.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

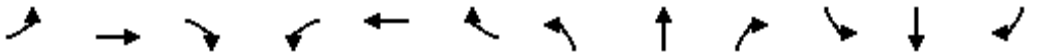


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1098	511	402	783	402	248	230
v/c Ratio	0.67	0.69	0.98	0.37	0.42	0.49	0.43
Control Delay	28.1	13.4	74.9	10.3	25.2	21.5	9.1
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0	0.0
Total Delay	28.1	13.4	74.9	10.8	25.2	21.5	9.1
Queue Length 50th (ft)	191	60	~240	116	83	81	22
Queue Length 95th (ft)	241	183	#413	155	121	150	78
Internal Link Dist (ft)	315			260		545	
Turn Bay Length (ft)		95			250		
Base Capacity (vph)	1634	736	412	2135	1121	574	600
Starvation Cap Reductn	0	0	0	853	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.69	0.98	0.61	0.36	0.43	0.38

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1010	470	370	720	0	0	0	0	370	120	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	4.2	5.0					4.6	4.6	4.6
Lane Util. Factor		0.91	1.00	1.00	0.95					0.97	0.95	0.95
Frpb, ped/bikes		1.00	0.96	1.00	1.00					1.00	0.99	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00					0.99	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.93	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		5085	1516	1770	3539					3402	1624	1467
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		5085	1516	1770	3539					3402	1624	1467
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1098	511	402	783	0	0	0	0	402	130	348
RTOR Reduction (vph)	0	0	249	0	0	0	0	0	0	0	41	124
Lane Group Flow (vph)	0	1098	262	402	783	0	0	0	0	402	207	106
Confl. Peds. (#/hr)			10	10			10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		27.3	27.3	19.8	51.3					24.1	24.1	24.1
Effective Green, g (s)		27.3	27.3	19.8	51.3					24.1	24.1	24.1
Actuated g/C Ratio		0.32	0.32	0.23	0.60					0.28	0.28	0.28
Clearance Time (s)		5.0	5.0	4.2	5.0					4.6	4.6	4.6
Vehicle Extension (s)		0.2	0.2	0.2	0.2					0.2	0.2	0.2
Lane Grp Cap (vph)		1633	487	412	2136					965	460	416
v/s Ratio Prot		c0.22		c0.23	0.22						c0.13	
v/s Ratio Perm			0.17							0.12		0.07
v/c Ratio		0.67	0.54	0.98	0.37					0.42	0.45	0.25
Uniform Delay, d1		25.0	23.7	32.4	8.6					24.7	25.0	23.5
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		2.2	4.2	37.5	0.5					0.1	0.3	0.1
Delay (s)		27.2	27.9	69.8	9.1					24.8	25.3	23.6
Level of Service		C	C	E	A					C	C	C
Approach Delay (s)		27.4			29.7			0.0			24.6	
Approach LOS		C			C			A			C	

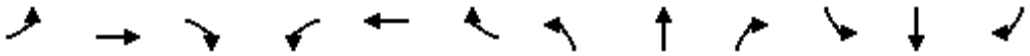
Intersection Summary			
HCM Average Control Delay	27.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	598	826	826	913	293	554
v/c Ratio	1.00	0.31	0.42	1.05	0.48	0.66
Control Delay	84.6	6.7	34.7	64.7	57.0	15.5
Queue Delay	226.7	1.4	1.2	50.3	0.0	0.0
Total Delay	311.3	8.1	35.9	115.0	57.0	15.5
Queue Length 50th (ft)	~629	136	219	~668	129	53
Queue Length 95th (ft)	#868	164	260	#932	177	124
Internal Link Dist (ft)		260	323			
Turn Bay Length (ft)				225	365	365
Base Capacity (vph)	601	2676	1976	873	699	894
Starvation Cap Reductn	212	1575	865	92	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.54	0.75	0.74	1.17	0.42	0.62

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	550	760	0	0	760	840	270	0	510	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.0			5.0	5.0	4.6		4.6			
Lane Util. Factor	1.00	0.95			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	0.94	1.00		0.95			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1770	3539			5085	1486	3383		2637			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1770	3539			5085	1486	3383		2637			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	598	826	0	0	826	913	293	0	554	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	295	0	0	360	0	0	0
Lane Group Flow (vph)	598	826	0	0	826	618	293	0	194	0	0	0
Confl. Peds. (#/hr)	10					10	10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6							
Permitted Phases						6	8		8			
Actuated Green, G (s)	50.9	113.4			58.3	58.3	27.0		27.0			
Effective Green, g (s)	50.9	113.4			58.3	58.3	27.0		27.0			
Actuated g/C Ratio	0.34	0.76			0.39	0.39	0.18		0.18			
Clearance Time (s)	4.2	5.0			5.0	5.0	4.6		4.6			
Vehicle Extension (s)	0.2	0.2			0.2	0.2	0.2		0.2			
Lane Grp Cap (vph)	601	2675			1976	578	609		475			
v/s Ratio Prot	c0.34	0.23			0.16							
v/s Ratio Perm						c0.42	c0.09		0.07			
v/c Ratio	1.00	0.31			0.42	1.07	0.48		0.41			
Uniform Delay, d1	49.4	5.8			33.5	45.9	55.2		54.4			
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00			
Incremental Delay, d2	35.2	0.3			0.7	57.5	0.2		0.2			
Delay (s)	84.6	6.1			34.1	103.3	55.4		54.6			
Level of Service	F	A			C	F	E		D			
Approach Delay (s)		39.1			70.5			54.9			0.0	
Approach LOS		D			E			D			A	

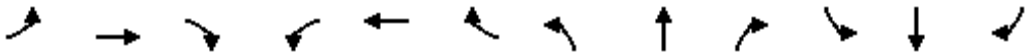
Intersection Summary			
HCM Average Control Delay	56.0	HCM Level of Service	E
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	76	1218	22	1358	500	131
v/c Ratio	1.33	0.58	0.12	1.22	1.30	0.25
Control Delay	259.8	17.0	13.3	133.1	190.1	19.4
Queue Delay	0.0	17.0	0.0	100.1	0.0	0.0
Total Delay	259.8	34.1	13.3	233.2	190.1	19.4
Queue Length 50th (ft)	~83	309	8	~1408	~540	44
Queue Length 95th (ft)	#141	373	23	#1677	#763	96
Internal Link Dist (ft)		323		304	593	79
Turn Bay Length (ft)	42		155			
Base Capacity (vph)	57	2101	179	1114	384	531
Starvation Cap Reductn	0	898	0	173	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.33	1.01	0.12	1.44	1.30	0.25

Intersection Summary

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

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



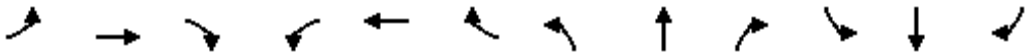
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	1010	110	20	1200	50	400	20	40	30	20	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.99			0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1770	3487		1770	1852			1764			1695	
Flt Permitted	0.05	1.00		0.16	1.00			0.64			0.89	
Satd. Flow (perm)	95	3487		298	1852			1177			1522	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	1098	120	22	1304	54	435	22	43	33	22	76
RTOR Reduction (vph)	0	6	0	0	1	0	0	3	0	0	39	0
Lane Group Flow (vph)	76	1212	0	22	1357	0	0	497	0	0	92	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	78.1	78.1		78.1	78.1			42.1			42.1	
Effective Green, g (s)	78.1	78.1		78.1	78.1			42.1			42.1	
Actuated g/C Ratio	0.60	0.60		0.60	0.60			0.32			0.32	
Clearance Time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Vehicle Extension (s)	1.0	1.0		1.0	1.0			2.0			2.0	
Lane Grp Cap (vph)	57	2095		179	1113			381			493	
v/s Ratio Prot		0.35			0.73							
v/s Ratio Perm	c0.80			0.07				c0.42			0.06	
v/c Ratio	1.33	0.58		0.12	1.22			1.31			0.19	
Uniform Delay, d1	26.0	15.9		11.2	26.0			44.0			31.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	231.8	1.2		1.4	106.9			155.2			0.1	
Delay (s)	257.7	17.0		12.6	132.8			199.2			31.7	
Level of Service	F	B		B	F			F			C	
Approach Delay (s)		31.2			130.9			199.2			31.7	
Approach LOS		C			F			F			C	

Intersection Summary			
HCM Average Control Delay	98.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	106.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	43	990	43	1108	239	195
v/c Ratio	0.52	0.43	0.14	0.91	0.63	0.66
Control Delay	37.9	8.7	8.5	27.9	33.0	38.4
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0
Total Delay	37.9	9.3	8.5	27.9	33.0	38.4
Queue Length 50th (ft)	13	138	9	530	98	86
Queue Length 95th (ft)	#72	182	25	#880	174	158
Internal Link Dist (ft)		304		883	602	1199
Turn Bay Length (ft)	150		150			
Base Capacity (vph)	83	2317	308	1218	430	336
Starvation Cap Reductn	0	859	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.68	0.14	0.91	0.56	0.58

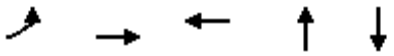
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	880	30	40	980	40	60	70	90	80	50	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.94			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1770	3522		1770	1852			1736			1754	
Flt Permitted	0.07	1.00		0.25	1.00			0.85			0.66	
Satd. Flow (perm)	126	3522		469	1852			1489			1186	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	957	33	43	1065	43	65	76	98	87	54	54
RTOR Reduction (vph)	0	2	0	0	1	0	0	29	0	0	16	0
Lane Group Flow (vph)	43	988	0	43	1107	0	0	210	0	0	179	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	59.1	59.1		59.1	59.1			21.1			21.1	
Effective Green, g (s)	59.1	59.1		59.1	59.1			21.1			21.1	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.23			0.23	
Clearance Time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Vehicle Extension (s)	2.9	2.9		2.9	2.9			2.0			2.0	
Lane Grp Cap (vph)	83	2313		308	1216			349			278	
v/s Ratio Prot		0.28			c0.60							
v/s Ratio Perm	0.34			0.09				0.14			c0.15	
v/c Ratio	0.52	0.43		0.14	0.91			0.60			0.64	
Uniform Delay, d1	8.0	7.4		5.8	13.2			30.7			31.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	21.2	0.6		0.9	11.6			2.0			3.8	
Delay (s)	29.3	7.9		6.8	24.8			32.7			34.9	
Level of Service	C	A		A	C			C			C	
Approach Delay (s)		8.8			24.1			32.7			34.9	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM Average Control Delay	19.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	87	1489	1391	184	141
v/c Ratio	0.94	0.56	0.73	0.33	0.27
Control Delay	117.7	15.2	26.3	17.1	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	117.7	15.2	26.3	17.1	14.8
Queue Length 50th (ft)	44	195	235	53	37
Queue Length 95th (ft)	#134	242	#302	99	75
Internal Link Dist (ft)		109	1248	382	134
Turn Bay Length (ft)	100				
Base Capacity (vph)	93	2679	1896	650	610
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.94	0.56	0.73	0.28	0.23

Intersection Summary

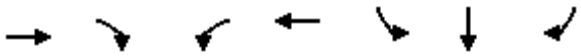
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	30	50	1290	80	0	1190	90	50	50	70	60	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.4	4.9			4.9			4.9			4.9
Lane Util. Factor		1.00	0.91			0.91			1.00			1.00
Frt		1.00	0.99			0.99			0.94			0.97
Flt Protected		0.95	1.00			1.00			0.99			0.98
Satd. Flow (prot)		1770	5041			5032			1733			1763
Flt Permitted		0.50	1.00			1.00			0.88			0.80
Satd. Flow (perm)		931	5041			5032			1550			1447
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	54	1402	87	0	1293	98	54	54	76	65	43
RTOR Reduction (vph)	0	0	8	0	0	10	0	0	12	0	0	15
Lane Group Flow (vph)	0	87	1481	0	0	1381	0	0	172	0	0	126
Turn Type	custom	Prot						Perm			Perm	
Protected Phases		5	2			6			8			4
Permitted Phases	5							8			4	
Actuated Green, G (s)		8.0	42.4			30.0			27.8			27.8
Effective Green, g (s)		8.0	42.4			30.0			27.8			27.8
Actuated g/C Ratio		0.10	0.53			0.38			0.35			0.35
Clearance Time (s)		4.4	4.9			4.9			4.9			4.9
Vehicle Extension (s)		2.0	1.0			1.0			2.0			2.0
Lane Grp Cap (vph)		93	2672			1887			539			503
v/s Ratio Prot			0.29			c0.27						
v/s Ratio Perm		c0.09							c0.11			0.09
v/c Ratio		0.94	0.55			0.73			0.32			0.25
Uniform Delay, d1		35.7	12.5			21.5			19.2			18.7
Progression Factor		1.00	1.00			1.00			1.00			1.00
Incremental Delay, d2		71.1	0.8			2.5			0.1			0.1
Delay (s)		106.9	13.3			24.1			19.3			18.7
Level of Service		F	B			C			B			B
Approach Delay (s)			18.5			24.1			19.3			18.7
Approach LOS			B			C			B			B

Intersection Summary			
HCM Average Control Delay	20.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	33
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

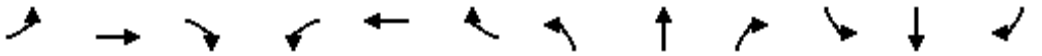


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	2011	424	652	1228	685	393	357
v/c Ratio	1.02	0.80	1.03	0.35	0.87	0.98	0.85
Control Delay	75.9	44.4	89.4	9.4	66.5	91.9	57.1
Queue Delay	0.0	0.0	283.3	2.5	0.0	0.0	0.0
Total Delay	75.9	44.4	372.7	11.9	66.5	91.9	57.1
Queue Length 50th (ft)	~586	267	~658	158	323	370	252
Queue Length 95th (ft)	#660	#425	#899	183	#422	#601	#436
Internal Link Dist (ft)	1248			230		598	
Turn Bay Length (ft)		100			200		
Base Capacity (vph)	1962	528	632	3521	784	400	418
Starvation Cap Reductn	0	0	245	2120	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.80	1.68	0.88	0.87	0.98	0.85

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1850	390	600	1130	0	0	0	0	630	200	490
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	4.2	5.0					5.6	5.6	5.6
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97	0.95	0.95
Frpb, ped/bikes		1.00	0.90	1.00	1.00					1.00	0.98	0.96
Flpb, ped/bikes		1.00	1.00	1.00	1.00					0.97	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.93	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		6408	1430	1770	5085					3345	1620	1442
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		6408	1430	1770	5085					3345	1620	1442
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2011	424	652	1228	0	0	0	0	685	217	533
RTOR Reduction (vph)	0	0	90	0	0	0	0	0	0	0	20	80
Lane Group Flow (vph)	0	2011	334	652	1228	0	0	0	0	685	373	277
Confl. Peds. (#/hr)			20	20			20		20	20		20
Confl. Bikes (#/hr)			5			5			5			5
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		44.4	44.4	51.8	100.4					34.0	34.0	34.0
Effective Green, g (s)		44.4	44.4	51.8	100.4					34.0	34.0	34.0
Actuated g/C Ratio		0.31	0.31	0.36	0.69					0.23	0.23	0.23
Clearance Time (s)		5.0	5.0	4.2	5.0					5.6	5.6	5.6
Vehicle Extension (s)		0.2	0.2	0.2	0.2					0.2	0.2	0.2
Lane Grp Cap (vph)		1962	438	632	3521					784	380	338
v/s Ratio Prot		c0.31		c0.37	0.24						c0.23	
v/s Ratio Perm			0.23							0.20		0.19
v/c Ratio		1.02	0.76	1.03	0.35					0.87	0.98	0.82
Uniform Delay, d1		50.3	45.5	46.6	9.0					53.4	55.2	52.6
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		26.9	11.9	44.2	0.3					12.9	41.8	19.6
Delay (s)		77.2	57.4	90.8	9.3					66.4	97.0	72.2
Level of Service		E	E	F	A					E	F	E
Approach Delay (s)		73.8			37.6			0.0			76.2	
Approach LOS		E			D			A			E	

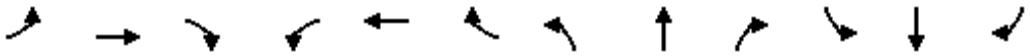
Intersection Summary			
HCM Average Control Delay	62.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	100.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	391	2402	1609	707	261	384	377
v/c Ratio	0.98	0.76	0.71	0.96	0.27	0.87	0.89
Control Delay	85.2	18.7	34.7	46.8	31.4	58.3	61.6
Queue Delay	103.1	80.8	0.0	0.0	0.0	0.0	0.0
Total Delay	188.3	99.5	34.7	46.8	31.4	58.3	61.6
Queue Length 50th (ft)	289	470	307	~339	73	271	268
Queue Length 95th (ft)	#486	535	352	#609	108	#435	#438
Internal Link Dist (ft)		230	588			231	
Turn Bay Length (ft)				90	140		
Base Capacity (vph)	402	3140	2279	733	1054	477	458
Starvation Cap Reductn	90	1099	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.25	1.18	0.71	0.96	0.25	0.81	0.82

Intersection Summary

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

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



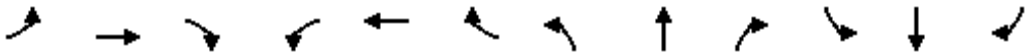
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	360	2210	0	0	1480	650	240	70	630	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.0			5.0	5.0	5.6	5.6	5.6			
Lane Util. Factor	1.00	0.91			0.86	1.00	0.97	0.95	0.95			
Frpb, ped/bikes	1.00	1.00			1.00	0.93	1.00	0.97	0.97			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	5085			6408	1472	3367	1514	1452			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	5085			6408	1472	3367	1514	1452			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	391	2402	0	0	1609	707	261	76	685	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	209	0	3	3	0	0	0
Lane Group Flow (vph)	391	2402	0	0	1609	498	261	381	374	0	0	0
Confl. Peds. (#/hr)	20					20	20		20	20		20
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	5	2			6			8				
Permitted Phases						6	8		8			
Actuated Green, G (s)	25.9	71.0			40.9	40.9	33.4	33.4	33.4			
Effective Green, g (s)	25.9	71.0			40.9	40.9	33.4	33.4	33.4			
Actuated g/C Ratio	0.23	0.62			0.36	0.36	0.29	0.29	0.29			
Clearance Time (s)	4.2	5.0			5.0	5.0	5.6	5.6	5.6			
Vehicle Extension (s)	0.2	0.2			0.2	0.2	0.2	0.2	0.2			
Lane Grp Cap (vph)	399	3139			2279	524	978	440	422			
v/s Ratio Prot	c0.22	0.47			0.25			0.25				
v/s Ratio Perm						c0.34	0.08		c0.26			
v/c Ratio	0.98	0.77			0.71	0.95	0.27	0.87	0.89			
Uniform Delay, d1	44.3	16.0			31.9	36.0	31.4	38.7	39.0			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	39.1	1.8			1.9	28.6	0.1	15.7	19.0			
Delay (s)	83.4	17.8			33.7	64.7	31.4	54.4	58.0			
Level of Service	F	B			C	E	C	D	E			
Approach Delay (s)		27.0			43.2			49.9			0.0	
Approach LOS		C			D			D			A	

Intersection Summary			
HCM Average Control Delay	36.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	100.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	261	1761	65	1413	185	151
v/c Ratio	0.91	0.73	0.61	0.79	0.43	0.32
Control Delay	69.3	21.8	61.7	29.7	21.7	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.3	21.8	61.7	29.7	21.7	17.1
Queue Length 50th (ft)	129	287	32	249	61	42
Queue Length 95th (ft)	#263	353	#90	#346	114	86
Internal Link Dist (ft)		588		574	300	317
Turn Bay Length (ft)	95		90			
Base Capacity (vph)	292	2407	108	1779	507	554
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.73	0.60	0.79	0.36	0.27

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	1530	90	60	1220	80	100	40	30	60	40	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9			4.9			4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.98			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	
Satd. Flow (prot)	1770	5043		1770	5038			1766			1753	
Flt Permitted	0.95	1.00		0.95	1.00			0.75			0.83	
Satd. Flow (perm)	1770	5043		1770	5038			1372			1479	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	1663	98	65	1326	87	109	43	33	65	43	43
RTOR Reduction (vph)	0	7	0	0	8	0	0	10	0	0	19	0
Lane Group Flow (vph)	261	1754	0	65	1405	0	0	175	0	0	132	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	13.0	37.2		3.9	28.1			24.7			24.7	
Effective Green, g (s)	13.0	37.2		3.9	28.1			24.7			24.7	
Actuated g/C Ratio	0.16	0.47		0.05	0.35			0.31			0.31	
Clearance Time (s)	4.4	4.9		4.4	4.9			4.9			4.9	
Vehicle Extension (s)	2.0	3.2		2.0	3.2			2.0			2.0	
Lane Grp Cap (vph)	288	2345		86	1770			424			457	
v/s Ratio Prot	c0.15	c0.35		0.04	0.28							
v/s Ratio Perm								c0.13			0.09	
v/c Ratio	0.91	0.75		0.76	0.79			0.41			0.29	
Uniform Delay, d1	32.9	17.6		37.6	23.3			21.9			21.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	29.3	2.2		27.9	3.8			0.2			0.1	
Delay (s)	62.2	19.8		65.5	27.1			22.1			21.1	
Level of Service	E	B		E	C			C			C	
Approach Delay (s)		25.3			28.8			22.1			21.1	
Approach LOS		C			C			C			C	

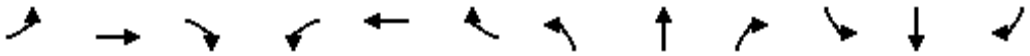
Intersection Summary			
HCM Average Control Delay	26.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	9.3
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	54	1065	65	1109	261	65	217	326	185
v/c Ratio	0.65	0.98	0.78	1.01	0.25	0.20	0.37	1.07	0.33
Control Delay	53.8	41.9	75.1	50.8	2.0	25.2	14.2	105.1	20.8
Queue Delay	0.0	0.0	0.0	104.4	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	41.9	75.1	155.2	2.0	25.2	14.2	105.1	20.8
Queue Length 50th (ft)	19	540	26	~612	2	27	46	~208	62
Queue Length 95th (ft)	#90	#864	#110	#911	32	60	105	#372	118
Internal Link Dist (ft)		289		315			568		302
Turn Bay Length (ft)	150		150			100		230	
Base Capacity (vph)	83	1090	83	1095	1034	332	582	304	558
Starvation Cap Reductn	0	0	0	219	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.98	0.78	1.27	0.25	0.20	0.37	1.07	0.33

Intersection Summary

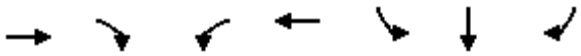
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	940	40	60	1020	240	60	60	140	300	100	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.89		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1851		1770	1863	1583	1770	1667		1770	1748	
Flt Permitted	0.08	1.00		0.08	1.00	1.00	0.59	1.00		0.54	1.00	
Satd. Flow (perm)	141	1851		141	1863	1583	1094	1667		1003	1748	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1022	43	65	1109	261	65	65	152	326	109	76
RTOR Reduction (vph)	0	2	0	0	0	103	0	76	0	0	28	0
Lane Group Flow (vph)	54	1063	0	65	1109	158	65	141	0	326	157	0
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	52.9	52.9		52.9	52.9	52.9	27.3	27.3		27.3	27.3	
Effective Green, g (s)	52.9	52.9		52.9	52.9	52.9	27.3	27.3		27.3	27.3	
Actuated g/C Ratio	0.59	0.59		0.59	0.59	0.59	0.30	0.30		0.30	0.30	
Clearance Time (s)	4.9	4.9		4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Vehicle Extension (s)	4.2	4.2		4.2	4.2	4.2	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	83	1088		83	1095	930	332	506		304	530	
v/s Ratio Prot		0.57			c0.60			0.08			0.09	
v/s Ratio Perm	0.38			0.46		0.10	0.06			c0.33		
v/c Ratio	0.65	0.98		0.78	1.01	0.17	0.20	0.28		1.07	0.30	
Uniform Delay, d1	12.4	18.0		14.2	18.6	8.5	23.2	23.9		31.4	24.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	33.3	22.4		51.3	30.4	0.4	0.1	0.1		72.2	0.1	
Delay (s)	45.7	40.3		65.5	48.9	8.9	23.3	24.0		103.5	24.1	
Level of Service	D	D		E	D	A	C	C		F	C	
Approach Delay (s)		40.6			42.4			23.8			74.8	
Approach LOS		D			D			C			E	

Intersection Summary			
HCM Average Control Delay	45.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

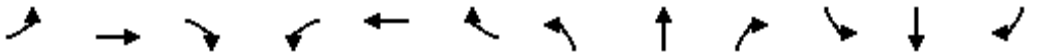


Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1228	489	533	935	750	418	365
v/c Ratio	0.89	0.96	0.98	0.42	0.81	0.87	0.73
Control Delay	42.6	56.3	69.7	10.3	39.6	51.3	27.5
Queue Delay	0.0	0.0	79.4	1.2	0.0	0.0	0.0
Total Delay	42.6	56.3	149.1	11.5	39.6	51.3	27.5
Queue Length 50th (ft)	263	218	~329	147	210	240	124
Queue Length 95th (ft)	#350	#429	#540	189	277	#404	236
Internal Link Dist (ft)	315			260		545	
Turn Bay Length (ft)		95			250		
Base Capacity (vph)	1387	511	542	2206	991	513	528
Starvation Cap Reductn	0	0	98	985	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.96	1.20	0.77	0.76	0.81	0.69

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1130	450	490	860	0	0	0	0	690	320	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	4.2	5.0					4.6	4.6	4.6
Lane Util. Factor		0.91	1.00	1.00	0.95					0.97	0.95	0.95
Frpb, ped/bikes		1.00	0.94	1.00	1.00					1.00	0.99	0.96
Flpb, ped/bikes		1.00	1.00	1.00	1.00					0.98	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.97	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		5085	1482	1770	3539					3363	1715	1450
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		5085	1482	1770	3539					3363	1715	1450
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1228	489	533	935	0	0	0	0	750	348	435
RTOR Reduction (vph)	0	0	107	0	0	0	0	0	0	0	8	103
Lane Group Flow (vph)	0	1228	382	533	935	0	0	0	0	750	410	262
Confl. Peds. (#/hr)			20	20			20		20	20		20
Confl. Bikes (#/hr)			5			5			5			5
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		25.9	25.9	29.1	59.2					26.2	26.2	26.2
Effective Green, g (s)		25.9	25.9	29.1	59.2					26.2	26.2	26.2
Actuated g/C Ratio		0.27	0.27	0.31	0.62					0.28	0.28	0.28
Clearance Time (s)		5.0	5.0	4.2	5.0					4.6	4.6	4.6
Vehicle Extension (s)		0.2	0.2	0.2	0.2					0.2	0.2	0.2
Lane Grp Cap (vph)		1386	404	542	2205					927	473	400
v/s Ratio Prot		0.24		c0.30	0.26						c0.24	
v/s Ratio Perm			c0.26							0.22		0.18
v/c Ratio		0.89	0.95	0.98	0.42					0.81	0.87	0.66
Uniform Delay, d1		33.1	33.9	32.7	9.2					32.1	32.7	30.4
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		8.6	33.0	34.1	0.6					5.0	14.9	2.9
Delay (s)		41.8	66.9	66.8	9.8					37.0	47.6	33.3
Level of Service		D	E	E	A					D	D	C
Approach Delay (s)		48.9			30.5			0.0			39.0	
Approach LOS		D			C			A			D	

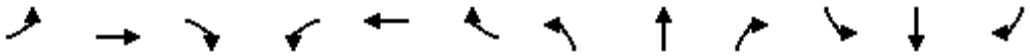
Intersection Summary			
HCM Average Control Delay	40.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	123.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	359	1554	1011	630	391	772
v/c Ratio	0.97	0.84	0.76	0.74	0.32	0.80
Control Delay	76.1	22.8	31.8	8.5	18.9	29.2
Queue Delay	0.0	50.3	0.0	0.0	0.0	0.0
Total Delay	76.1	73.1	31.8	8.5	18.9	29.2
Queue Length 50th (ft)	~206	350	171	0	68	177
Queue Length 95th (ft)	#367	#510	220	97	100	252
Internal Link Dist (ft)		260	323			
Turn Bay Length (ft)				225	365	365
Base Capacity (vph)	370	1851	1329	851	1310	1042
Starvation Cap Reductn	0	447	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.97	1.11	0.76	0.74	0.30	0.74

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	330	1430	0	0	930	580	360	0	710	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.0			5.0	5.0	4.6		4.6			
Lane Util. Factor	1.00	0.95			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	0.93	1.00		0.95			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	0.98		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1770	3539			5085	1479	3380		2646			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1770	3539			5085	1479	3380		2646			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	359	1554	0	0	1011	630	391	0	772	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	465	0	0	17	0	0	0
Lane Group Flow (vph)	359	1554	0	0	1011	165	391	0	755	0	0	0
Confl. Peds. (#/hr)	20					20	20		20	20		20
Confl. Bikes (#/hr)			5			5			5			5
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6							
Permitted Phases						6	8		8			
Actuated Green, G (s)	16.7	41.8			20.9	20.9	28.6		28.6			
Effective Green, g (s)	16.7	41.8			20.9	20.9	28.6		28.6			
Actuated g/C Ratio	0.21	0.52			0.26	0.26	0.36		0.36			
Clearance Time (s)	4.2	5.0			5.0	5.0	4.6		4.6			
Vehicle Extension (s)	0.2	0.2			0.2	0.2	0.2		0.2			
Lane Grp Cap (vph)	369	1849			1328	386	1208		946			
v/s Ratio Prot	c0.20	c0.44			0.20							
v/s Ratio Perm						0.11	0.12		c0.29			
v/c Ratio	0.97	0.84			0.76	0.43	0.32		0.80			
Uniform Delay, d1	31.4	16.3			27.2	24.6	18.7		23.1			
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00			
Incremental Delay, d2	39.3	4.8			4.2	3.4	0.1		4.5			
Delay (s)	70.7	21.1			31.4	28.0	18.7		27.6			
Level of Service	E	C			C	C	B		C			
Approach Delay (s)		30.4			30.1			24.6			0.0	
Approach LOS		C			C			C			A	

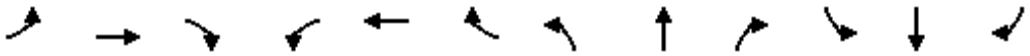
Intersection Summary			
HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	123.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	54	2066	22	1315	456	76
v/c Ratio	0.87	0.95	0.35	1.13	1.16	0.15
Control Delay	109.8	31.4	30.1	93.0	135.1	13.2
Queue Delay	0.0	114.9	0.0	102.9	0.0	0.0
Total Delay	109.8	146.4	30.1	195.9	135.1	13.2
Queue Length 50th (ft)	32	716	8	~1184	~416	12
Queue Length 95th (ft)	#77	#962	38	#1452	#624	50
Internal Link Dist (ft)		323		304	593	79
Turn Bay Length (ft)	42		155			
Base Capacity (vph)	62	2179	62	1165	393	502
Starvation Cap Reductn	0	540	0	199	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.87	1.26	0.35	1.36	1.16	0.15

Intersection Summary

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1640	260	20	1200	10	350	10	60	10	10	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	1.00			0.98			0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1770	3466		1770	1860			1754			1672	
Flt Permitted	0.05	1.00		0.05	1.00			0.73			0.94	
Satd. Flow (perm)	99	3466		99	1860			1325			1587	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1783	283	22	1304	11	380	11	65	11	11	54
RTOR Reduction (vph)	0	10	0	0	0	0	0	5	0	0	38	0
Lane Group Flow (vph)	54	2056	0	22	1315	0	0	451	0	0	38	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	75.1	75.1		75.1	75.1			35.1			35.1	
Effective Green, g (s)	75.1	75.1		75.1	75.1			35.1			35.1	
Actuated g/C Ratio	0.63	0.63		0.63	0.63			0.29			0.29	
Clearance Time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Vehicle Extension (s)	1.0	1.0		1.0	1.0			2.0			2.0	
Lane Grp Cap (vph)	62	2169		62	1164			388			464	
v/s Ratio Prot		0.59			c0.71							
v/s Ratio Perm	0.54			0.22				c0.34			0.02	
v/c Ratio	0.87	0.95		0.35	1.13			1.16			0.08	
Uniform Delay, d1	18.5	20.6		10.8	22.5			42.5			30.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	81.5	10.4		15.2	69.5			97.9			0.0	
Delay (s)	100.0	31.1		26.0	92.0			140.4			30.8	
Level of Service	F	C		C	F			F			C	
Approach Delay (s)		32.8			90.9			140.4			30.8	
Approach LOS		C			F			F			C	

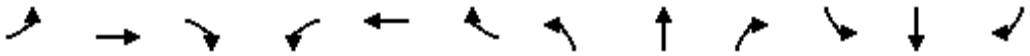
Intersection Summary			
HCM Average Control Delay	64.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	102.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	54	2087	65	1456	283	305
v/c Ratio	0.79	0.87	0.96	1.15	1.11	0.91
Control Delay	84.4	18.7	123.4	97.6	127.4	70.7
Queue Delay	0.0	72.7	0.0	0.0	0.0	0.0
Total Delay	84.4	91.4	123.4	97.6	127.4	70.7
Queue Length 50th (ft)	24	540	38	~1217	~220	196
Queue Length 95th (ft)	#66	670	#90	#1484	#392	#364
Internal Link Dist (ft)		304		883	602	1199
Turn Bay Length (ft)	150		150			
Base Capacity (vph)	68	2402	68	1265	255	334
Starvation Cap Reductn	0	603	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.79	1.16	0.96	1.15	1.11	0.91

Intersection Summary

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

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

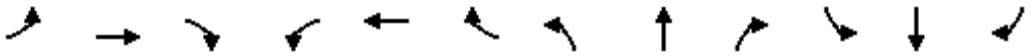


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1830	90	60	1280	60	100	90	70	70	110	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1770	3514		1770	1850			1761			1751	
Flt Permitted	0.05	1.00		0.05	1.00			0.59			0.78	
Satd. Flow (perm)	99	3514		99	1850			1063			1381	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1989	98	65	1391	65	109	98	76	76	120	109
RTOR Reduction (vph)	0	3	0	0	2	0	0	12	0	0	19	0
Lane Group Flow (vph)	54	2084	0	65	1454	0	0	271	0	0	286	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	75.1	75.1		75.1	75.1			25.1			25.1	
Effective Green, g (s)	75.1	75.1		75.1	75.1			25.1			25.1	
Actuated g/C Ratio	0.68	0.68		0.68	0.68			0.23			0.23	
Clearance Time (s)	4.9	4.9		4.9	4.9			4.9			4.9	
Vehicle Extension (s)	2.9	2.9		2.9	2.9			2.0			2.0	
Lane Grp Cap (vph)	68	2399		68	1263			243			315	
v/s Ratio Prot		0.59			c0.79							
v/s Ratio Perm	0.54			0.66				c0.25			0.21	
v/c Ratio	0.79	0.87		0.96	1.15			1.11			0.91	
Uniform Delay, d1	12.1	13.6		15.9	17.5			42.5			41.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	61.4	4.6		97.2	77.7			91.7			27.9	
Delay (s)	73.5	18.2		113.2	95.2			134.1			69.3	
Level of Service	E	B		F	F			F			E	
Approach Delay (s)		19.6			95.9			134.1			69.3	
Approach LOS		B			F			F			E	

Intersection Summary			
HCM Average Control Delay	58.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	102.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

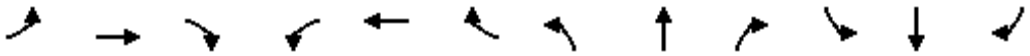
Appendix G

2035 Mitigated Intersection Synchro Sheets



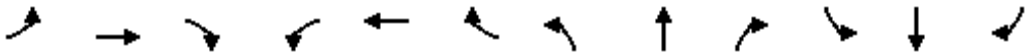
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	970	100	20	1150	40	350	20	40	20	20	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9		4.9	4.9			4.9	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.90			0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	3489		1770	1853		1770	1678			1696	
Flt Permitted	0.06	1.00		0.19	1.00		0.68	1.00			0.94	
Satd. Flow (perm)	118	3489		352	1853		1270	1678			1616	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	1054	109	22	1250	43	380	22	43	22	22	65
RTOR Reduction (vph)	0	8	0	0	1	0	0	31	0	0	47	0
Lane Group Flow (vph)	65	1155	0	22	1292	0	380	34	0	0	62	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	63.1	63.1		63.1	63.1		27.1	27.1			27.1	
Effective Green, g (s)	63.1	63.1		63.1	63.1		27.1	27.1			27.1	
Actuated g/C Ratio	0.63	0.63		0.63	0.63		0.27	0.27			0.27	
Clearance Time (s)	4.9	4.9		4.9	4.9		4.9	4.9			4.9	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	74	2202		222	1169		344	455			438	
v/s Ratio Prot		0.33			c0.70			0.02				
v/s Ratio Perm	0.55			0.06			c0.30				0.04	
v/c Ratio	0.88	0.52		0.10	1.11		1.10	0.07			0.14	
Uniform Delay, d1	15.3	10.2		7.3	18.4		36.5	27.1			27.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	74.4	0.9		0.9	60.1		79.7	0.0			0.1	
Delay (s)	89.7	11.1		8.2	78.5		116.2	27.1			27.7	
Level of Service	F	B		A	E		F	C			C	
Approach Delay (s)		15.2			77.3			103.2			27.7	
Approach LOS		B			E			F			C	

Intersection Summary			
HCM Average Control Delay	54.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



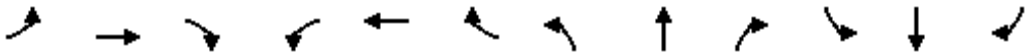
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	1570	230	20	1150	10	310	10	50	10	10	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9		4.9	4.9			4.9	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.88			0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	3471		1770	1860		1770	1631			1682	
Flt Permitted	0.06	1.00		0.06	1.00		0.77	1.00			0.96	
Satd. Flow (perm)	113	3471		113	1860		1429	1631			1629	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1707	250	22	1250	11	337	11	54	11	11	43
RTOR Reduction (vph)	0	12	0	0	0	0	0	25	0	0	33	0
Lane Group Flow (vph)	43	1945	0	22	1261	0	337	40	0	0	32	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	66.1	66.1		66.1	66.1		24.1	24.1			24.1	
Effective Green, g (s)	66.1	66.1		66.1	66.1		24.1	24.1			24.1	
Actuated g/C Ratio	0.66	0.66		0.66	0.66		0.24	0.24			0.24	
Clearance Time (s)	4.9	4.9		4.9	4.9		4.9	4.9			4.9	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	75	2294		75	1229		344	393			393	
v/s Ratio Prot		0.56			c0.68			0.02				
v/s Ratio Perm	0.38			0.20			c0.24				0.02	
v/c Ratio	0.57	0.85		0.29	1.03		0.98	0.10			0.08	
Uniform Delay, d1	9.3	13.1		7.1	17.0		37.7	29.5			29.4	
Progression Factor	1.00	1.00		0.53	0.49		1.00	1.00			1.00	
Incremental Delay, d2	28.1	4.1		0.9	15.5		42.4	0.0			0.0	
Delay (s)	37.4	17.2		4.7	23.7		80.1	29.6			29.4	
Level of Service	D	B		A	C		F	C			C	
Approach Delay (s)		17.6			23.4			71.9			29.4	
Approach LOS		B			C			E			C	

Intersection Summary			
HCM Average Control Delay	25.6	HCM Level of Service	C
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



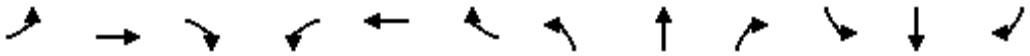
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	1010	110	20	1200	50	400	20	40	30	20	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9		4.9	4.9			4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.90			0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	3487		1770	3518		1770	1678			1695	
Flt Permitted	0.14	1.00		0.14	1.00		0.74	1.00			0.93	
Satd. Flow (perm)	254	3487		254	3518		1370	1678			1592	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	1098	120	22	1304	54	435	22	43	33	22	76
RTOR Reduction (vph)	0	13	0	0	5	0	0	28	0	0	16	0
Lane Group Flow (vph)	76	1205	0	22	1353	0	435	37	0	0	115	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	29.3	29.3		29.3	29.3		20.9	20.9			20.9	
Effective Green, g (s)	29.3	29.3		29.3	29.3		20.9	20.9			20.9	
Actuated g/C Ratio	0.49	0.49		0.49	0.49		0.35	0.35			0.35	
Clearance Time (s)	4.9	4.9		4.9	4.9		4.9	4.9			4.9	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	124	1703		124	1718		477	585			555	
v/s Ratio Prot		0.35			c0.38			0.02				
v/s Ratio Perm	0.30			0.09			c0.32				0.07	
v/c Ratio	0.61	0.71		0.18	0.79		0.91	0.06			0.21	
Uniform Delay, d1	11.2	12.0		8.6	12.8		18.7	13.0			13.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	20.6	2.5		3.1	3.7		21.3	0.0			0.1	
Delay (s)	31.8	14.5		11.7	16.5		40.0	13.0			13.8	
Level of Service	C	B		B	B		D	B			B	
Approach Delay (s)		15.5			16.4			36.5			13.8	
Approach LOS		B			B			D			B	

Intersection Summary			
HCM Average Control Delay	19.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



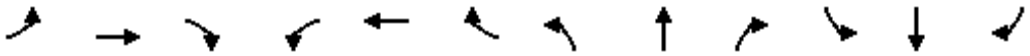
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	880	30	40	980	40	60	70	90	80	50	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9		4.9	4.9			4.9	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.92			0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1770	3522		1770	1852		1770	1705			1754	
Flt Permitted	0.07	1.00		0.25	1.00		0.59	1.00			0.69	
Satd. Flow (perm)	129	3522		470	1852		1091	1705			1244	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	957	33	43	1065	43	65	76	98	87	54	54
RTOR Reduction (vph)	0	2	0	0	1	0	0	54	0	0	16	0
Lane Group Flow (vph)	43	988	0	43	1107	0	65	120	0	0	179	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	59.3	59.3		59.3	59.3		20.9	20.9			20.9	
Effective Green, g (s)	59.3	59.3		59.3	59.3		20.9	20.9			20.9	
Actuated g/C Ratio	0.66	0.66		0.66	0.66		0.23	0.23			0.23	
Clearance Time (s)	4.9	4.9		4.9	4.9		4.9	4.9			4.9	
Vehicle Extension (s)	2.9	2.9		2.9	2.9		2.0	2.0			2.0	
Lane Grp Cap (vph)	85	2321		310	1220		253	396			289	
v/s Ratio Prot		0.28			c0.60			0.07				
v/s Ratio Perm	0.33			0.09			0.06				c0.14	
v/c Ratio	0.51	0.43		0.14	0.91		0.26	0.30			0.62	
Uniform Delay, d1	7.9	7.3		5.8	13.0		28.2	28.5			31.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	19.9	0.6		0.9	11.3		0.2	0.2			2.8	
Delay (s)	27.8	7.8		6.7	24.3		28.4	28.7			33.7	
Level of Service	C	A		A	C		C	C			C	
Approach Delay (s)		8.7			23.7			28.6			33.7	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM Average Control Delay	19.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1640	260	20	1200	10	350	10	60	10	10	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9		4.9	4.9			4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.87			0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	3466		1770	3535		1770	1624			1672	
Flt Permitted	0.14	1.00		0.07	1.00		0.76	1.00			0.97	
Satd. Flow (perm)	269	3466		135	3535		1418	1624			1627	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1783	283	22	1304	11	380	11	65	11	11	54
RTOR Reduction (vph)	0	14	0	0	1	0	0	14	0	0	39	0
Lane Group Flow (vph)	54	2052	0	22	1314	0	380	62	0	0	37	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	55.0	55.0		55.0	55.0		25.2	25.2			25.2	
Effective Green, g (s)	55.0	55.0		55.0	55.0		25.2	25.2			25.2	
Actuated g/C Ratio	0.61	0.61		0.61	0.61		0.28	0.28			0.28	
Clearance Time (s)	4.9	4.9		4.9	4.9		4.9	4.9			4.9	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	164	2118		83	2160		397	455			456	
v/s Ratio Prot		c0.59			0.37			0.04				
v/s Ratio Perm	0.20			0.16			c0.27				0.02	
v/c Ratio	0.33	0.97		0.27	0.61		0.96	0.14			0.08	
Uniform Delay, d1	8.5	16.7		8.1	10.8		31.9	24.2			23.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	5.3	13.5		7.6	1.3		33.6	0.0			0.0	
Delay (s)	13.8	30.2		15.8	12.1		65.5	24.3			23.9	
Level of Service	B	C		B	B		E	C			C	
Approach Delay (s)		29.7			12.2			58.6			23.9	
Approach LOS		C			B			E			C	

Intersection Summary			
HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1830	90	60	1280	60	100	90	70	70	110	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9		4.9	4.9		4.9	4.9			4.9	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.93			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	3514		1770	1850		1770	1741			1751	
Flt Permitted	0.05	1.00		0.05	1.00		0.36	1.00			0.70	
Satd. Flow (perm)	88	3514		88	1850		672	1741			1238	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1989	98	65	1391	65	109	98	76	76	120	109
RTOR Reduction (vph)	0	3	0	0	1	0	0	19	0	0	17	0
Lane Group Flow (vph)	54	2084	0	65	1455	0	109	155	0	0	288	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.1	85.1		85.1	85.1		25.1	25.1			25.1	
Effective Green, g (s)	85.1	85.1		85.1	85.1		25.1	25.1			25.1	
Actuated g/C Ratio	0.71	0.71		0.71	0.71		0.21	0.21			0.21	
Clearance Time (s)	4.9	4.9		4.9	4.9		4.9	4.9			4.9	
Vehicle Extension (s)	2.9	2.9		2.9	2.9		2.0	2.0			2.0	
Lane Grp Cap (vph)	62	2492		62	1312		141	364			259	
v/s Ratio Prot		0.59			c0.79			0.09				
v/s Ratio Perm	0.62			0.74			0.16				c0.23	
v/c Ratio	0.87	0.84		1.05	1.11		0.77	0.43			1.11	
Uniform Delay, d1	13.3	12.5		17.5	17.5		44.8	41.2			47.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	81.5	3.5		128.4	60.3		20.9	0.3			89.8	
Delay (s)	94.8	16.0		145.9	77.7		65.7	41.5			137.3	
Level of Service	F	B		F	E		E	D			F	
Approach Delay (s)		18.0			80.6			50.8			137.3	
Approach LOS		B			F			D			F	

Intersection Summary			
HCM Average Control Delay	51.1	HCM Level of Service	D
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	108.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			