ANNE ARUNDEL COUNTY
MARYLAND

FUTURE CONDITIONS REPORT

TRANSPORTATION FACILITIES PLANNING MD 713 CORRIDOR / RIDGE ROAD

CONTRACT # H539606

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1.0 INTRODUCTION

1.1 Project Purpose

Ridge Road (MD 713) is a state-owned road in northwest Anne Arundel County, paralleling the Baltimore Washington Parkway. Project limits are MD 175 to the south and Dorsey Road (MD 176) to the north. The corridor connects public facilities and activity centers with residential areas. Pedestrian and bicycle accommodations between residential areas and activity are currently limited and not constructed to County and State standards. The growth in employment and population from planned and future developments along or near MD 713 is expected to result in increased travel demand and recurring congestion. The purpose of the MD 713 transportation facility planning study is to identify future year 2040 deficiencies, evaluate build alternatives to address deficiencies, improve travel in the corridor by reducing current and forecasted congestion, reduce crash potential, improve pedestrian and bicycle compatibility, while minimizing impacts to the natural and built environment. The final product is a vetted conceptual design that can be advanced into Final Design.

1.2 Executive Summary

The findings and recommendations for the MD 713 transportation facility planning study are as follows:

- By Year 2040, traffic volumes are expected to double in the southern portion of the corridor, and increase by 50% in the northern area near MD 100.
- Expected growth along the length of the corridor will result in the following study intersections operating at a LOS F overall during weekday AM, weekday PM, or Saturday peak hours under the No-Build 2040 scenario:
  - MD 713 at MD 175
  - MD 713 at Stone Castle Drive
  - MD 713 at Severn Avenue
  - MD 713 at Watts Avenue
  - MD 713 at Teague Road
- A preferred Design concept was developed that includes the following:
  1. Mainline reconstruction, widening, and dualization with median from MD 175 to Teague Road
     a. Changing the posted speed limit from 45 mph to 35 mph between MD 175 and Arundel Mill Blvd to reflect the residential land uses and to account for prevailing speeds along this segment.
  2. New traffic signal at Stone Castle Drive
  3. Additional turn lanes:
     - Ridge Road at Teague Road
     - Ridge Road at Severn Avenue
  4. If MD 713 at MD 175 is to remain at-grade, a Displace Left-Turn Intersection is recommended. Otherwise, the volumes at this intersection will warrant an interchange.
  5. No changes to the typical roadway lane configuration are proposed from Teague Road north to Dorsey Road.

- To improve pedestrian connectivity between residential communities and commercial developments, a new continuous sidewalk is proposed on at least one side MD 713 from MD 175 to Dorsey Road.
- Bicycle improvements recommended for the 2040 design year include continuous on-road bike lanes along the east and west sides of MD 713 between MD 175 and Teague Road. North of Teague Road to the project limits, bicyclists are proposed to utilize a new shared-use path extending to Dorsey Road.
- No stormwater improvements are recommended from Teague to Dorsey Road, as the roadbed is recommended to remain as is; from Teague to MD 175, stormwater management is recommended to be accommodated within a wide center median.
- The total amount of new right-of-way acquisition required under the recommended design for year 2040 is about 3 acres.
- The estimated construction cost for the recommended design is $21 million.

1.3 Study Area Location and Limits

The study corridor consists of Ridge Road (MD 713) from the Access Control Point of Fort George G. Meade at Rockenbach Road south of Annapolis Road (MD 175) to Dorsey Road (MD 176). The following nine intersections were included in this study and evaluated for long-term traffic operations:

1. Ridge Road (MD 713) at Annapolis Road (MD 175)
2. Ridge Road (MD 713) at Metacomet Road/Stone Castle Dr
3. Ridge Road (MD 713) at Severn Road/Ridgewood Road
4. Ridge Road (MD 713) at Watts Avenue/Ridge Forest Way
5. Ridge Road (MD 713) at Teague Road
6. Ridge Road (MD 713) at Arundel Mills Boulevard
7. Arundel Mills Boulevard (MD 713) at Bass Pro Drive
8. Arundel Mills Boulevard (MD 713) at MD 100 to/from Westbound Ramps
9. Arundel Mills Boulevard (MD 713) at Dorsey Road (MD 176)

A base map of the study area is shown in Figure 1.

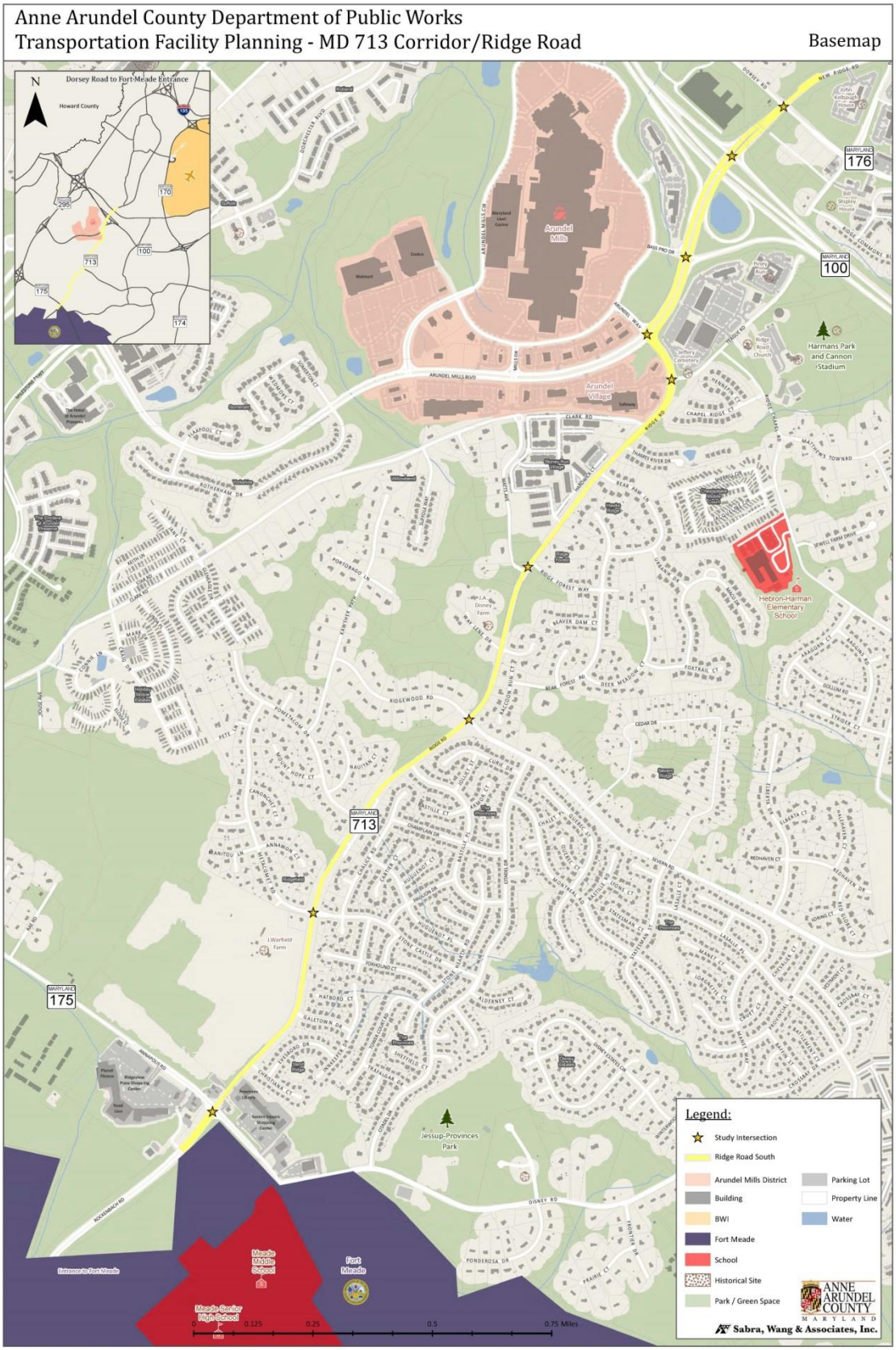


Figure 1: Study Area Base Map

2.0 EXISTING CONDITIONS

This section highlights relevant data and observations, collected for the *Existing Conditions Report*, that was used to develop and define the future year geometry and typical cross-sections[1].

2.1 Roadway Characteristics

MD 713 is a state-maintained, two-way urban minor arterial that runs in a north-south direction from the Access Control Point of Fort George G. Meade, just south of Annapolis Rd (MD 175), to Dorsey Rd (MD 176). MD 713 is an undivided two-lane road from MD 175 to Stoney Run Drive, a divided four-lane road from Stoney Run Drive and Arundel Mills Boulevard, and a divided six-lane road between Arundel Way and MD 176. The posted speed limit on MD 713 is 45 mph from MD 175 to Arundel Mills Blvd, and is 40 mph from Arundel Mills Boulevard to MD 176. The ADT varies significantly along the corridor, from approximately 16,000 vehicles just north of MD 175 to approximately 44,000 vehicles between Arundel Way and Bass Pro Dr.

2.2 Pedestrian and Bicycle Facilities

The only bicycle facility along the corridor is a shared-use path along the westbound approach of MD 713 at Annapolis Rd (MD 175) and a shared-use path on the western side of MD 713 from Arundel Mills Blvd to Stoney Run Drive. MD 713 also has a shoulder of variable width that can be utilized for biking. Maryland law allows cyclists to ride in the lane on roadways that are signed under 45 mph[2]. Few cyclists were observed using vehicle lanes.

While sidewalks are prevalent within in the abutting residential neighborhoods, they are largely absent along the study corridor. Similarly, there are few crosswalks, pedestrian signals and pedestrian curb ramps along MD 713, as shown in Table 1**.**

[1] All collected and observational data can be found in the previously-issued *Existing Conditions* Report.
[2] The posted speed limit on MD 713 is 45 mph from MD 175 to Stoney Run Dr, and is 40 mph from Stoney Run Dr to MD 176. The Average speed at the midpoint in the segment was measured at 37 mph, while the 85th% speed was 43 mph.

Table 1: Pedestrian Amenities

#	Intersection	Pedestrian Amenities					
		Sidewalks	Marked Crosswalks	Pedestrian Signals	Push Buttons to Cross	Pedestrian Refuge	ADA Compliant Ramps
1	MD 713 at MD 175	South side of West Leg North and South side of East leg East side of North leg	North, South, and East	Yes	Yes	North and East	Yes
2	MD 713 at Metacomet Road	North side of West leg North and South side of East leg	No	No	No	None	Only on West leg
3	MD 713 at Severn Road	None	n/a	n/a	n/a	n/a	n/a
4	MD 713 at Watts Road	North side of East leg	No	No	No	No	Non-compliant ramp on East leg
5	MD 713 at Teague Rd	All except East side of North leg	North and West	Yes	Yes	No	Yes
6	MD 713 at Arundel Mills Blvd	All except North side of West leg, East side of North leg, and North side of East leg	South and West	Yes	Yes	No	Yes
7	MD 713 at Bass Pro Dr	Only on South side of West leg, and West side of South leg	No	No	No	No	No
8	MD 713 at MD 100 WB Ramp	None	n/a	n/a	n/a	n/a	n/a
9	MD 713 at MD 176	None	n/a	n/a	n/a	n/a	n/a

2.3 Crash Data Analysis

Three years of crash data was reviewed provided for the period from January 1, 2012 to December 31, 2014. A total of 129 police-reported accidents occurred along the 2.5 mile corridor. Table 2 presents the most common types of crashes by intersection.

- No fatal crashes occurred in the corridor during the evaluated time
- 40% of the crashes involved injuries.
- No crashes involved pedestrians.
- Angle collisions were the most common type, with forty-four (34%) collisions. Rear end collisions were the second-most common type, with thirty-seven (29%) crashes. Left turn collisions were the third most common type, with twenty-three (18%) crashes.

Based on the corridor analysis, the following are observed:

- The fatality rate is in line with the statewide average for a corridor of this type.
- The injury rate and property damage only (PDO) rate are both higher than the statewide average for a corridor of this type.
- Additionally, the following crash types have rates higher than the statewide average:
    - Opposite Direction Crashes
    - Rear end Crashes
    - Sideswipe Crashes
    - Angle Crashes
    - Fixed object Crashes

No segments or intersections have been identified by SHA as Candidate Safety Improvement Locations (CSIL).

Table 2: Crash Data Summary

#	Intersection	year	Most Common Accident Type			Total Accidents
			Angle	Rear End	Left Turn	
1	MD 713 at MD 175	2012	0	2	4	7
		2013	0	4	2	6
		2014	0	3	0	3
		Total	**0**	**9**	**6**	**16**
2	MD 713 at Metacomet Rd	2012	0	0	0	0
		2013	2	1	1	4
		2014	0	1	0	2
		Total	**2**	**2**	**1**	**6**
3	MD 713 at Severn Rd	2012	0	0	1	1
		2013	1	0	2	4
		2014	0	0	1	1
		Total	**1**	**0**	**4**	**6**
4	MD 713 at Watts Ave/Ridge Forest Way	2012	0	0	0	0
		2013	0	1	0	1
		2014	0	1	0	2
		Total	**0**	**2**	**0**	**3**
5	MD 713 at Teague Rd	2012	4	0	0	4
		2013	0	0	1	1
		2014	1	1	1	3
		Total	**5**	**1**	**2**	**8**
6	MD 713 at Arundel Mills Blvd	2012	1	1	0	2
		2013	2	3	1	10
		2014	1	3	0	6
		Total	**4**	**7**	**1**	**18**
7	MD 713 at Bass Pro Dr	2012	7	4	0	11
		2013	5	1	0	6
		2014	2	2	0	6
		Total	**14**	**7**	**0**	**23**
8	MD 713 at MD 100 Westbound Ramps	2012	5	2	1	10
		2013	1	2	3	11
		2014	3	1	1	6
		Total	**9**	**5**	**5**	**27**
9	MD 713 at MD 176	2012	3	1	1	7
		2013	4	0	1	5
		2014	2	3	2	11
		Total	**9**	**4**	**4**	**23**

2.3.1 Safety Recommendations

In general, volume-adjusted intersection crashes were low, with crashes per million-entering vehicles (MEV) well under 1.0 for all intersections[3].

Additionally, two intersections with the highest crash numbers have had recent lane configuration or phasing changes within the 2012-2014 crash data collection period:

- *Intersection of MD 713 at MD 175:* east-west left-turn phasing was modified to be protected/permitted to protected-only. Left-turn crashes decreased from 4 in 2012 to 0 in 2014. This can partially be attributed to the removal of the permissive phase.

[3] An MEV exceeding 1.0 is generally cause for further examination of crash typology and causal factors.

- *Intersection of MD 713 at MD 176:* The east leg of the intersection was modified from one left turn lane and one shared left-through-right lane to two left lanes and a shared through-right lane, with the split phases remaining.

Angled crashes were prevalent at two intersections: 1) Ridge Road & Bass Pro Drive; and 2) Ridge Road & the westbound MD 100 ramps. High speeds are attainable at these intersections; however, no fatalities were recorded in the data collection period. These intersections are well-lit, have sight distance that meets or exceed AASHTO standards, and have long all-red clearance intervals. All intersections are in a developed area of the county, so attentive drivers would expect traffic signals. Planned improvements include static advanced warning signs for the northbound approaches of the intersections. Accordingly, no signal or geometric changes are recommended for the Year 2040 design.

2.4 Existing Capacity Analysis

Weekday AM and PM and Saturday mid-day peak period traffic data was collected in the fall of 2015. Figure 5, Figure 6, and Figure 7, summarize the existing balanced weekday AM, weekday PM, and Saturday peak hour traffic volumes, respectively. These volumes were entered into a validated Synchro model, whose imbedded Highway Capacity Manual (HCM) software was then used to analyze existing intersection capacity. Performance measures of effectiveness include level of service (LOS), volume-to-capacity (v/c) ratio, and average vehicle delay. A Critical Lane Volume (CLV) analysis was also performed[4]. Table 3 summarizes both HCM and CLV analysis results for the existing conditions.

The results of the existing conditions capacity analysis indicate that no overall intersections fail during the weekday AM, PM, or Saturday Mid-day peak hours. However, three individual turning movements have a failing LOS and exceed capacity.

- Ridge Road at Watts Ave/Ridge Forest Way
  - Southbound through-right
- Ridge Road at Teague Road
  - Eastbound through-left
  - Westbound through-left

According to the CLV analysis, no study intersection operates below a LOS E during the AM peak hour, the PM peak hour and the Saturday Mid-day peak hour.

Short-term improvements to mitigate the failing HCM intersection turning movements under existing conditions are discussed in detail in the "Existing Conditions Analysis" report.

In addition to capacity analysis, queuing was assessed using SimTraffic, Synchro's companion software. In general, queuing throughout the network was minimal during the weekday morning and Saturday peak hours. During the weekday afternoon peak hour excessive queuing was observed northbound at Severn Road and Southbound at Watts Avenue with 95th percentile queue lengths exceeding 1,000 ft at both locations.

[4] HCM provides a more robust capacity analysis; while CLV is a less-exact planning-level capacity analysis tool.

Table 3: Existing Intersection Capacity Analysis Results

#	Intersection	Movement	Existing Conditions AM (PM) [Sat]					
			Delay/Veh (sec)	Level of Service	Volume/Capacity Ratio	Critical Lane Volume	Level of Service	Volume/Capacity Ratio
1	MD 713 at MD 175	**Overall**	**41.0 (48.9) [34.4]**	**D (D) [C]**	**0.71 (0.76) [0.46]**	1015 (1134) [765]	B (B) [A]	0.63 (0.71) [0.48]
		EBL	68.7 (64.9) [69.0]	E (E) [E]	0.51 (0.82) [0.70]			
		EBT	28.9 (30.0) [13.6]	C (C) [B]	0.39 (0.67) [0.29]			
		EBR	0.3 (0.1) [0.1]	A (A) [A]	0.22 (0.07) [0.05]			
		WBL	68.7 (69.1) [71.1]	E (E) [E]	0.53 (0.40) [0.32]			
		WBT	35.9 (42.1) [20.2]	D (D) [C]	0.70 (0.62) [0.37]			
		WBR	8.5 (24.0) [8.0]	A (C) [A]	0.09 (0.32) [0.16]			
		NBL	76.9 (79.2) [72.0]	E (E) [E]	0.66 (0.80) [0.48]			
		NBLT	67.9 (70.2) [70.0]	E (E) [E]	0.55 (0.79) [0.48]			
		NBR	62.7 (55.3) [66.4]	E (E) [E]	0.03 (0.09) [0.03]			
		SBL	52.7 (81.8) [64.9]	D (F) [E]	0.55 (0.78) [0.59]			
		SBLTR	60.9 (73.5) [61.2]	E (E) [E]	0.79 (0.78) [0.55]			
		SBR	47.0 (58.5) [55.0]	D (E) [E]	0.19 (0.10) [0.09]			
2	MD 713 at Metacomet Rd*	**Overall**	**3.8 (2.0) [1.4]**	**- (-) [-]**	**- (-) [-]**	1025 (1172) [623]	B (C) [A]	0.64 (0.73) [0.39]
		EBLTR	19.7 (30.5) [17.3]	C (D) [C]	0.09 (0.10) [0.05]			
		WBLTR	57.7 (59.7) [23.8]	F (F) [C]	0.59 (0.38) [0.20]			
		NBL	10.6 (8.7) [8.7]	B (A) [A]	0.01 (0.02) [0.02]			
		NBTR	0.0 (0.0) [0.0]	- (-) [-]	0.20 (0.64) [0.34]			
		SBL	8.0 (11.0) [11.0]	A (B) [B]	0.01 (0.06) [0.02]			
		SBTR	0.0 (0.0) [0.0]	- (-) [-]	0.63 (0.33) [0.31]			
3	MD 713 at Severn Rd	**Overall**	**25.4 (25.4) [17.4]**	**C (C) [B]**	**0.78 (0.78) [0.53]**	1004 (1230) [1015]	B (C) [B]	0.63 (0.77) [0.63]
		EBLTR	19.0 (40.5) [28.5]	B (D) [C]	0.05 (0.11) [0.07]			
		WBLT	34.4 (49.4) [32.2]	C (D) [C]	0.79 (0.62) [0.50]			
		WBR	21.5 (41.4) [29.6]	C (D) [C]	0.33 (0.22) [0.23]			
		NBL	18.0 (14.0) [12.3]	B (B) [B]	0.03 (0.01) [0.01]			
		NBT	22.4 (30.9) [19.6]	C (C) [B]	0.46 (0.81) [0.59]			
		NBR	17.8 (17.3) [13.7]	B (B) [B]	0.04 (0.24) [0.08]			
		SBL	11.9 (30.4) [7.0]	B (C) [A]	0.21 (0.78) [0.42]			
		SBTR	27.5 (9.7) [8.7]	C (A) [A]	0.79 (0.57) [0.41]			
4	MD 713 at Watts Ave/Ridge Forest Way	**Overall**	**17.3 (63.4) [16.8]**	**B (E) [B]**	**0.53 (0.89) [0.58]**	780 (1250) [855]	A (C) [A]	0.49 (0.78) [0.53]
		EBLTR	49.4 (54.9) [50.8]	D (D) [D]	0.03 (0.26) [0.02]			
		WBLTR	49.2 (48.9) [52.4]	D (D) [D]	0.02 (0.15) [0.02]			
		NBL	9.9 (25.8) [9.3]	A (C) [A]	0.06 (0.32) [0.01]			
		NBT	14.7 (48.0) [17.2]	B (D) [B]	0.60 (0.98) [0.69]			
		NBR	9.1 (12.0) [9.0]	A (B) [A]	0.06 (0.05) [0.02]			
		SBL	9.9 (24.3) [10.1]	A (C) [B]	0.03 (0.35) [0.09]			
		SBTR	16.2 (84.7) [13.5]	B (F) [B]	0.64 (1.10) [0.59]			
5	MD 713 at Teague Rd	**Overall**	**19.3 (60.9) [35.2]**	**B (E) [D]**	**0.48 (0.72) [0.42]**	729 (1174) [859]	A (C) [A]	0.46 (0.73) [0.54]
		EBLT	22.5 (209.7) [64.1]	C (F) [E]	0.18 (1.25) [0.36]			
		EBR	21.4 (38.7) [52.3]	C (D) [D]	0.02 (0.06) [0.11]			
		WBLT	27.5 (217.4) [81.3]	C (F) [F]	0.59 (1.32) [0.51]			
		WBR	22.5 (41.3) [52.2]	C (D) [D]	0.19 (0.30) [0.10]			
		NBL	11.7 (28.5) [26.3]	B (C) [C]	0.21 (0.37) [0.34]			
		NBT	18.4 (39.6) [32.0]	B (D) [C]	0.41 (0.53) [0.39]			
		NBR	17.1 (34.8) [27.0]	B (C) [C]	0.06 (0.16) [0.04]			
		SBL	26.3 (24.0) [18.1]	C (C) [B]	0.47 (0.32) [0.18]			
		SBTR	12.5 (34.3) [22.4]	B (C) [C]	0.32 (0.49) [0.39]			
6	MD 713 at Arundel Mills Blvd	**Overall**	**15.9 (31.4) [33.6]**	**B (C) [C]**	**0.65 (0.61) [0.63]**	924 (1145) [1074]	A (B) [B]	0.58 (0.72) [0.67]
		EBL	31.3 (57.6) [60.6]	C (E) [E]	0.18 (0.60) [0.65]			
		EBTR	31.1 (55.4) [56.6]	C (E) [E]	0.14 (0.48) [0.46]			
		WBL	30.9 (37.9) [35.9]	C (D) [D]	0.32 (0.71) [0.59]			
		WBT	31.4 (42.0) [44.4]	C (D) [D]	0.35 (0.74) [0.75]			
		WBR	1.2 (0.8) [0.3]	A (A) [A]	0.51 (0.48) [0.24]			
		NBL	38.3 (63.0) [69.7]	D (E) [E]	0.25 (0.46) [0.55]			
		NBT	19.8 (32.0) [30.0]	B (C) [C]	0.15 (0.35) [0.31]			
		NBR	12.2 (19.0) [13.6]	B (B) [B]	0.08 (0.36) [0.21]			
		SBL	29.8 (68.3) [57.6]	C (E) [E]	0.63 (0.68) [0.66]			
		SBT	12.8 (22.3) [52.0]	B (C) [D]	0.26 (0.34) [0.50]			
		SBR	0.2 (0.4) [1.1]	A (A) [A]	0.12 (0.29) [0.52]			
7	MD 713 at Bass Pro Dr	**Overall**	**6.1 (11.5) [13.0]**	**A (B) [B]**	**0.40 (0.51) [0.77]**	548 (1074) [1013]	A (B) [B]	0.34 (0.67) [0.63]
		EBL	20.7 (56.4) [59.7]	C (E) [E]	0.17 (0.62) [0.72]			
		EBT	20.2 (55.9) [56.2]	C (E) [E]	0.05 (0.56) [0.57]			
		EBR	20.0 (49.4) [49.4]	C (D) [D]	0.01 (0.03) [0.11]			
		NBT	8.5 (12.4) [9.1]	A (B) [A]	0.33 (0.29) [0.25]			
		NBR	0.2 (0.8) [0.6]	A (A) [A]	0.17 (0.44) [0.35]			
		SBL	25.4 (95.4) [94.6]	C (F) [F]	0.19 (0.36) [0.34]			
		SBT	4.2 (2.0) [3.4]	A (A) [A]	0.38 (0.46) [0.50]			
		SBR	0.2 (0.6) [2.6]	A (A) [A]	0.12 (0.33) [0.70]			
8	MD 713 at MD 100 Westbound Ramps	**Overall**	**11.2 (26.4) [37.5]**	**B (C) [D]**	**0.59 (0.53) [0.61]**	683 (873) [1027]	A (A) [B]	0.43 (0.55) [0.64]
		WBL	24.6 (55.4) [60.0]	C (E) [E]	0.40 (0.71) [0.76]			
		WBLT	27.2 (65.0) [69.4]	C (E) [E]	0.46 (0.76) [0.79]			
		WBR	0.0 (0.1) [0.0]	A (A) [A]	0.04 (0.05) [0.02]			
		NBL	21.5 (23.6) [33.7]	C (C) [C]	0.62 (0.38) [0.54]			
		NBT	4.3 (5.8) [8.9]	A (A) [A]	0.32 (0.29) [0.14]			
		SBT	18.1 (64.8) [62.4]	B (E) [E]	0.32 (0.68) [0.64]			
		SBR	1.0 (0.7) [0.3]	A (A) [A]	0.47 (0.40) [0.20]			
9	MD 713 at MD 176	**Overall**	**25.3 (36.5) [16.2]**	**C (D) [B]**	**0.54 (0.65) [0.29]**	777 (984) [409]	A (A) [A]	0.49 (0.62) [0.26]
		EBL	39.7 (43.0) [29.8]	D (D) [C]	0.15 (0.19) [0.03]			
		EBT	40.7 (56.8) [30.2]	D (E) [C]	0.37 (0.77) [0.25]			
		EBR	0.2 (0.2) [0.2]	A (A) [A]	0.15 (0.16) [0.14]			
		WBL	32.5 (51.0) [26.4]	C (D) [C]	0.69 (0.65) [0.49]			
		WBTR	28.2 (46.6) [22.9]	C (D) [C]	0.47 (0.43) [0.09]			
		NBL	40.4 (76.7) [31.3]	D (E) [C]	0.48 (0.73) [0.29]			
		NBT	24.9 (25.2) [13.4]	C (C) [B]	0.42 (0.28) [0.13]			
		NBR	7.3 (7.2) [6.2]	A (A) [A]	0.23 (0.39) [0.14]			
		SBL	49.4 (67.2) [37.5]	D (E) [D]	0.31 (0.31) [0.29]			
		SBT	30.5 (39.9) [16.6]	C (D) [B]	0.29 (0.53) [0.17]			
		SBR	29.4 (33.7) [16.5]	C (C) [B]	0.02 (0.06) [0.00]			

* Unsignalized Intersection

3.0 YEAR 2040 FUTURE NO-BUILD CONDITIONS

3.1 Year 2040 No-Build Roadway Network

Two locations along Ridge Road are subject to developer-required mitigations:

- *MD 713 at MD 175:* An additional thru-lane will be added to the northbound approach of the intersection. The northern leg of the intersection will also have to be widened to accommodate a third receiving lane. This mitigation was required of The Commons at Shipley's Homestead development.
- *MD 713 between MD 175 and Metacomet Rd/Stone Castle Dr:* MD 713 will be widened between MD 175 and Metacomet Rd/Stone Castle Dr to a 5-lane section: two lanes in each direction and a center turn lane. MD 713 will remain a two-lane road north of Metacomet Rd/Stone Castle Dr. This mitigation was required of The Commons at Shipley's Homestead development.

All of the aforementioned developer improvements are not constructed yet, but are expected be constructed by the 2040 design year and are included in the No-Build 2040 capacity analysis.

3.2 Year 2040 Traffic Volumes

Travel demand forecasting was performed to estimate both regional and local growth along the Ridge Road corridor for Year 2040. This analysis utilized the Baltimore Metropolitan Council's (BMC) Travel 4.4 model to estimate Average Weekday Daily Traffic (AWDT) for the Ridge Road corridor and the surrounding roadway network for years 2017 and 2040.

A subarea analysis was performed to generate AWDT counts with a higher level of detail for the study area. The subarea network improvements were validated using actual AWDT counts and those counts generated by the original BMC model runs. A more detailed summary of the travel demand forecasting analysis is located in Appendix A. In general, the AWDT for 2040 is expected to double to about 45,000 along Ridge Road between MD 175 and Arundel Mill Blvd; and from Arundel Way to MD 100, the AWDT is expected to increase about 50% to about 80,000. A map of AWDT counts produced by the subarea analysis for the existing and future design years can be found in Appendix A.

Future year 2040 turning movement counts were estimated by post processing the AWDT counts generated from the subarea analysis based upon processing methods outlined in the National Cooperative Highway Research Program (NCHRP) Report 255 and 765. Post processing starts by calculating growth rates between the existing 2017 and the future 2040 model outputs for each AWDT within the study area. The growth rates for each turning movement in the corridor are then calculated by averaging the growth rates for the origin and destination links of each turning movement. Once growth rates for each turning movement are applied at each study intersection, the volumes within the network are balanced. Post processing is repeated for each future peak hour studied. Future year 2040 intersection counts for the morning, evening and Saturday peak hours can be found in Figure 2, Figure 3, and Figure 4, respectively.

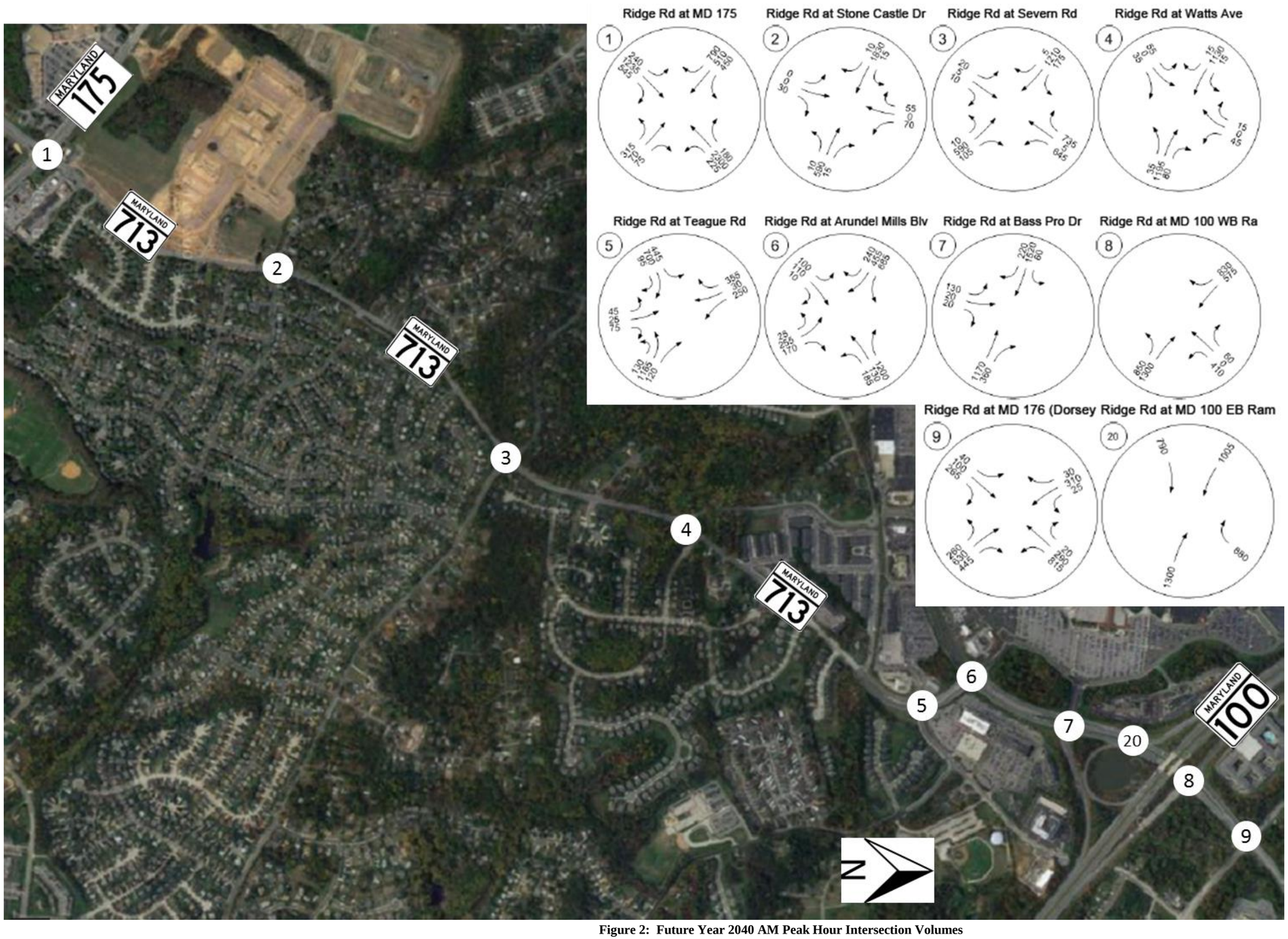


Figure 2: Future Year 2040 AM Peak Hour Intersection Volumes

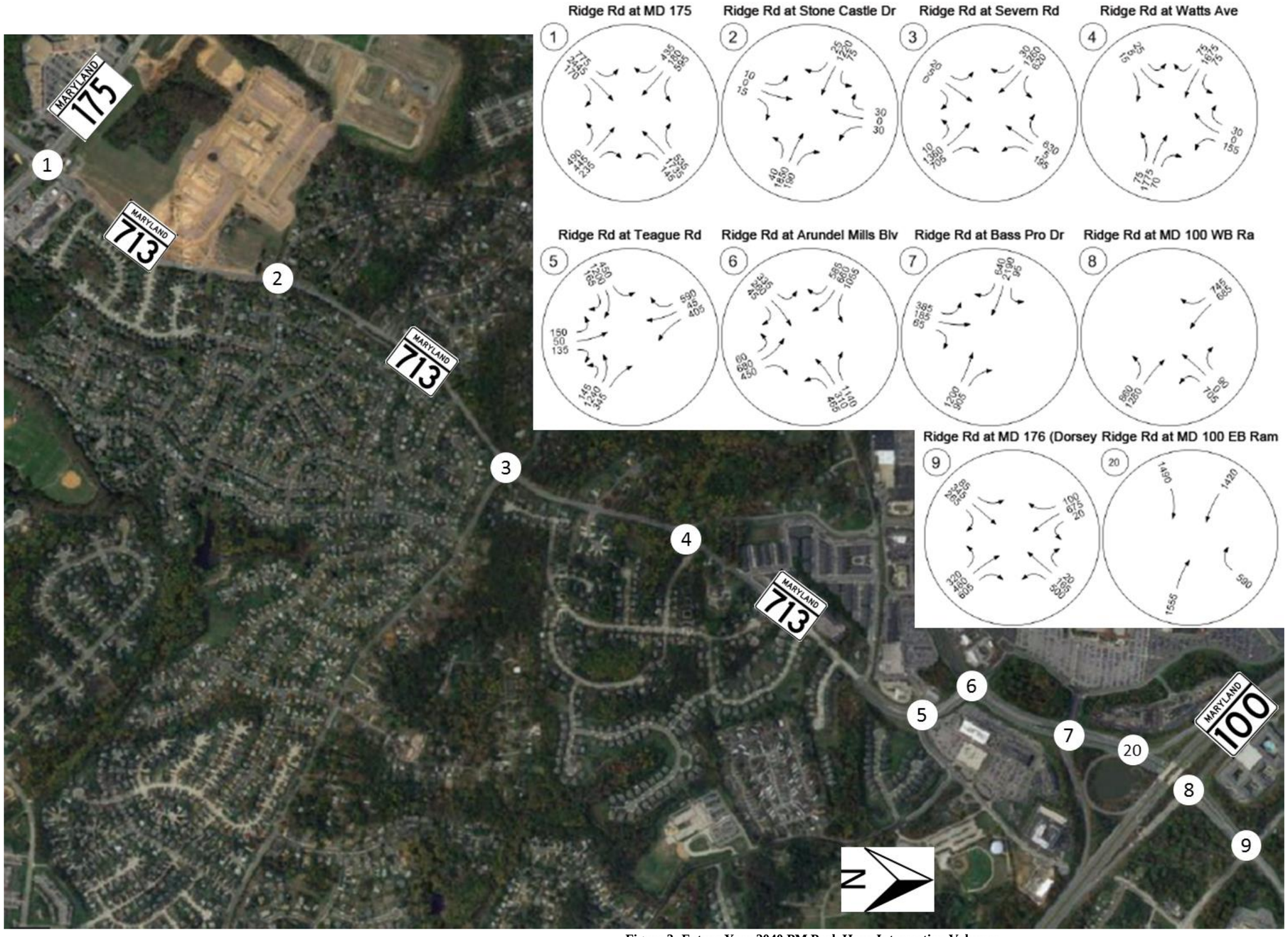


Figure 3: Future Year 2040 PM Peak Hour Intersection Volumes

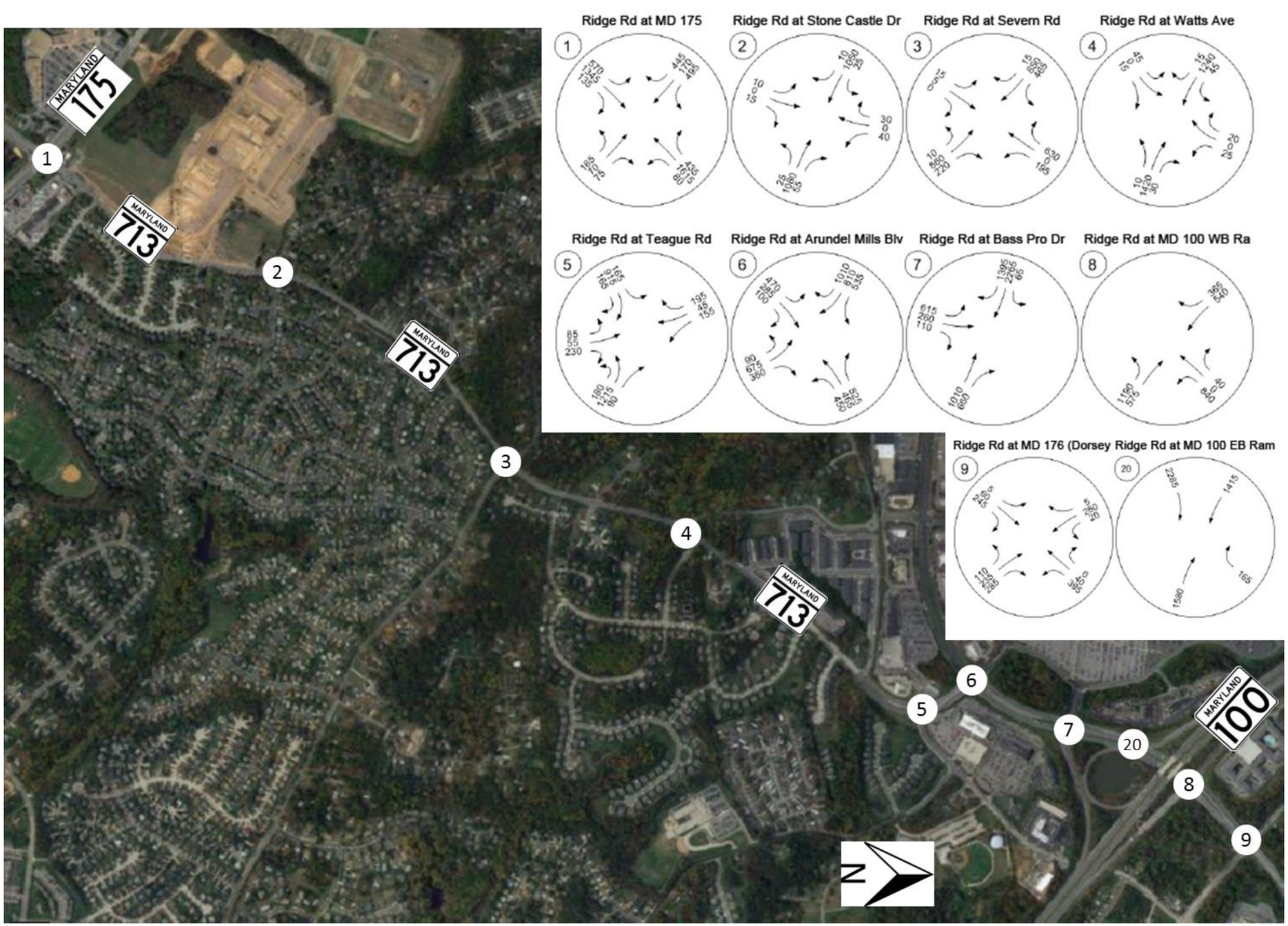


Figure 4: Future Year 2040 Saturday Peak Hour Intersection Volumes

3.3 Year 2040 No-Build Capacity Analysis

To conduct a traffic operations analysis, a validated Synchro model of the No-Build 2040 roadway network was developed and populated with forecasted future year 2040 volumes. An intersection capacity analysis was performed using CLV and HCM – with all existing signal timings maintained. Queuing along intersection approaches was also assessed. Table 4 summarizes the HCM and CLV capacity analysis results for the nine study intersections, with detailed CLV worksheets and Synchro HCM reports are in Appendix B and C, respectively.

The Maryland State Highway Administration defers to local guidelines for setting thresholds for failing intersections. Anne Arundel County sets a failing threshold for HCM below LOS D. The results of the HCM and CLV capacity analysis, shown in Table 5, indicate that the following study intersections operate at a LOS E or F overall during weekday AM, weekday PM, or Saturday peak hours under the No-Build 2040 scenario:

1. Ridge Road at MD 175
2. Ridge Road at Stone Castle Drive
3. Ridge Road at Severn Avenue
4. Ridge Road at Watts Avenue
5. Ridge Road at Teague Road

All intersections north of Teague Road remain with acceptable LOS.

Extensive queuing was observed throughout the network during all three peak hours analyzed. SimTraffic simulations indicate that Ridge Road at Watts Avenue will form a bottleneck in the northbound and southbound directions of the corridor, resulting in long queues at adjacent intersection and eventually spilling out of the network. Long queues in excess of 1,000 feet were also observed on the westbound approach along MD 175 during all three peaks.

Optimizing the signal timing and phasing was insufficient to correct the failing level of service at any of the above intersections. Accordingly, the development of the build alternative contains capacity improvements through lane widening to mitigate both the queuing and the five study intersections that are expected to have a failing LOS in year 2040.

Table 4: Year 2040 No-Build Intersection Capacity Analysis Results

#	Intersection	Movement	2040 No Build AM (PM) [Sat]					
			Delay/Veh (sec)	Level of Service	Volume/Capacity Ratio	Critical Lane Volume	Level of Service	Volume/Capacity Ratio
1	MD 713 at MD 175	**Overall**	**245.7 (190.3) [75.5]**	**F (F) [E]**	**1.46 (1.42) [1.01]**	**1926 (1906) [1493]**	**F (F) [E]**	**1.20 (1.19) [0.93]**
		EBL	78.0 (264.5) [85.8]	E (F) [F]	0.79 (1.43) [0.95]			
		EBT	115.2 (202.3) [32.2]	F (F) [C]	1.12 (1.36) [0.76]			
		EBR	0.7 (0.1) [0.1]	A (A) [A]	0.37 (0.11) [0.09]			
		WBL	75.9 (273.8) [69.2]	E (F) [E]	0.76 (1.34) [0.40]			
		WBT	547.2 (181.1) [140.3]	F (F) [F]	2.10 (1.29) [1.19]			
		WBR	13.8 (23.9) [15.3]	B (C) [B]	0.17 (0.59) [0.40]			
		NBL	79.9 (283.0) [87.6]	E (F) [F]	0.79 (1.42) [0.73]			
		NBLT	58.7 (206.3) [66.9]	E (F) [E]	0.37 (1.28) [0.43]			
		NBR	55.7 (66.1) [64.3]	E (E) [E]	0.05 (0.56) [0.05]			
		SBL	116.7 (259.8) [71.9]	F (F) [E]	1.06 (1.38) [0.83]			
		SBLTR	172.5 (269.3) [65.1]	F (F) [E]	1.24 (1.43) [0.83]			
		SBR	64.8 (62.2) [47.9]	E (E) [D]	0.81 (0.54) [0.19]			
2	MD 713 at Metacomet Rd*	**Overall**	**475.8 (242.2) [22.9]**	**- (-) [-]**	**- (-) [-]**	**1982 (1998) [1189]**	**F (F) [C]**	**1.24 (1.25) [0.74]**
		EBLTR	111.4 (>250) [153.2]	F (F) [F]	0.53 (4.64) [0.56]			
		WBLTR	>500 (>250) [701.7]	F (F) [F]	17.14 (9.72) [2.00]			
		NBL	19.6 (12.0) [10.9]	C (B) [B]	0.04 (0.07) [0.04]			
		NBT	0.0 (0.0) [0.0]	A (A) [A]	0.40 (1.10) [0.66]			
		NBR	0.0 (0.0) [0.0]	A (A) [A]	0.01 (0.11) [0.03]			
		SBL	9.1 (23.4) [11.4]	A (C) [B]	0.02 (0.28) [0.04]			
		SBTR	0.0 (0.0) [0.0]	A (A) [A]	1.24 (0.74) [0.65]			
3	MD 713 at Severn Rd	**Overall**	**172.7 (202.0) [82.1]**	**F (F) [F]**	**1.48 (1.52) [1.13]**	**1960 (2240) [1570]**	**F (F) [E]**	**1.22 (1.40) [0.98]**
		EBLTR	29.0 (35.7) [35.4]	C (D) [D]	0.17 (0.08) [0.06]			
		WBLT	433.9 (47.1) [45.5]	F (D) [D]	1.86 (0.67) [0.65]			
		WBR	135.7 (80.9) [81.7]	F (F) [F]	1.17 (0.96) [0.96]			
		NBL	25.1 (28.8) [21.7]	C (C) [C]	0.11 (0.11) [0.07]			
		NBT	32.6 (418.1) [139.2]	C (F) [F]	0.79 (1.84) [1.20]			
		NBR	18.0 (36.3) [22.6]	B (D) [C]	0.07 (0.76) [0.18]			
		SBL	17.0 (271.0) [131.0]	B (F) [F]	0.51 (1.49) [1.15]			
		SBTR	164.6 (119.3) [24.6]	F (F) [C]	1.29 (1.19) [0.83]			
4	MD 713 at Watts Ave/Ridge Forest Way	**Overall**	**101.8 (430.7) [132.0]**	**F (F) [F]**	**0.96 (1.49) [1.12]**	**1360 (2080) [1570]**	**D (F) [E]**	**0.85 (1.30) [0.98]**
		EBLTR	48.1 (57.1) [52.4]	D (E) [D]	0.06 (0.31) [0.04]			
		WBLTR	50.1 (54.8) [52.3]	D (D) [D]	0.04 (0.49) [0.03]			
		NBL	26.3 (27.7) [27.7]	C (C) [C]	0.29 (0.45) [0.12]			
		NBT	114.0 (484.1) [184.5]	F (F) [F]	1.18 (2.00) [1.34]			
		NBR	10.4 (15.5) [10.0]	B (B) [B]	0.05 (0.05) [0.02]			
		SBL	25.8 (27.7) [28.1]	C (C) [C]	0.15 (0.45) [0.32]			
		SBTR	105.7 (477.1) [86.7]	F (F) [F]	1.16 (1.98) [1.12]			
5	MD 713 at Teague Rd	**Overall**	**29.5 (153.5) [38.5]**	**C (F) [D]**	**0.70 (1.80) [0.64]**	**1098 (1801) [1214]**	**B (F) [C]**	**0.69 (1.13) [0.76]**
		EBLT	30.1 (1624.7) [63.3]	C (F) [E]	0.24 (4.40) [0.53]			
		EBR	28.1 (38.8) [47.4]	C (D) [D]	0.05 (0.09) [0.15]			
		WBLT	47.8 (560.3) [84.9]	D (F) [F]	0.80 (2.10) [0.72]			
		WBR	30.1 (46.8) [47.2]	C (D) [D]	0.24 (0.59) [0.13]			
		NBL	18.3 (28.4) [19.7]	B (C) [B]	0.37 (0.56) [0.53]			
		NBT	29.8 (49.9) [36.9]	C (D) [D]	0.66 (0.85) [0.63]			
		NBR	23.6 (36.3) [27.3]	C (D) [C]	0.08 (0.23) [0.06]			
		SBL	41.6 (22.6) [22.8]	D (C) [C]	0.64 (0.40) [0.21]			
		SBTR	18.3 (41.1) [31.4]	B (D) [C]	0.49 (0.76) [0.62]			
6	MD 713 at Arundel Mills Blvd	**Overall**	**18.0 (34.7) [41.4]**	**B (C) [D]**	**0.97 (0.87) [0.85]**	**652 (1205) [1088]**	**A (C) [B]**	**0.41 (0.75) [0.68]**
		EBL	37.1 (57.6) [60.5]	D (E) [E]	0.26 (0.68) [0.73]			
		EBTR	37.3 (55.0) [55.4]	D (E) [E]	0.30 (0.59) [0.57]			
		WBL	35.4 (49.4) [25.7]	D (D) [C]	0.38 (0.79) [0.58]			
		WBT	36.7 (58.9) [97.9]	D (E) [F]	0.49 (0.97) [1.09]			
		WBR	4.3 (0.3) [0.5]	A (A) [A]	0.80 (0.74) [0.35]			
		NBL	45.1 (63.0) [71.1]	D (E) [E]	0.34 (0.48) [0.59]			
		NBT	25.4 (43.0) [43.1]	C (D) [D]	0.19 (0.51) [0.46]			
		NBR	15.8 (27.6) [19.3]	B (C) [B]	0.10 (0.54) [0.34]			
		SBL	30.2 (65.7) [58.4]	C (E) [E]	0.66 (0.77) [0.74]			
		SBT	12.9 (25.5) [69.4]	B (C) [E]	0.27 (0.40) [0.67]			
		SBR	0.2 (0.6) [1.8]	A (A) [A]	0.16 (0.38) [0.67]			
7	MD 713 at Bass Pro Dr	**Overall**	**7.2 (12.0) [15.7]**	**A (B) [B]**	**0.51 (0.67) [1.00]**	**686 (1107) [1275]**	**A (B) [C]**	**0.43 (0.69) [0.80]**
		EBL	20.5 (54.7) [56.2]	C (D) [E]	0.22 (0.67) [0.75]			
		EBT	19.8 (54.0) [51.8]	B (D) [D]	0.06 (0.59) [0.59]			
		EBR	19.6 (46.2) [44.7]	B (D) [D]	0.01 (0.04) [0.16]			
		NBT	10.8 (13.7) [8.2]	B (B) [A]	0.50 (0.38) [0.33]			
		NBR	0.4 (1.3) [0.8]	A (A) [A]	0.25 (0.60) [0.43]			
		SBL	24.3 (93.6) [97.1]	C (F) [F]	0.18 (0.40) [0.38]			
		SBT	5.0 (3.1) [8.5]	A (A) [A]	0.48 (0.60) [0.66]			
		SBR	0.2 (0.8) [9.2]	A (A) [A]	0.15 (0.43) [0.91]			
8	MD 713 at MD 100 Westbound Ramps	**Overall**	**13.8 (28.5) [39.2]**	**B (C) [D]**	**0.71 (0.62) [0.75]**	**904 (1072) [1266]**	**A (B) [C]**	**0.57 (0.67) [0.79]**
		WBL	29.9 (54.4) [57.8]	C (D) [E]	0.47 (0.74) [0.78]			
		WBLT	32.7 (64.6) [67.3]	C (E) [E]	0.52 (0.79) [0.82]			
		WBR	0.1 (0.1) [0.0]	A (A) [A]	0.04 (0.06) [0.03]			
		NBL	23.7 (28.5) [39.9]	C (C) [D]	0.72 (0.52) [0.74]			
		NBT	5.1 (6.9) [10.2]	A (A) [B]	0.40 (0.36) [0.18]			
		SBT	25.9 (72.5) [64.0]	C (E) [E]	0.47 (0.74) [0.73]			
		SBR	1.6 (0.9) [0.4]	A (A) [A]	0.58 (0.50) [0.25]			
9	MD 713 at MD 176	**Overall**	**29.7 (43.1) [17.6]**	**C (D) [B]**	**0.64 (0.80) [0.35]**	**961 (1208) [506]**	**A (C) [A]**	**0.60 (0.76) [0.32]**
		EBL	46.3 (40.4) [32.1]	D (D) [C]	0.20 (0.22) [0.03]			
		EBT	47.8 (56.6) [32.9]	D (E) [C]	0.44 (0.81) [0.30]			
		EBR	0.2 (03.) [0.2]	A (A) [A]	0.18 (0.19) [0.16]			
		WBL	35.0 (48.0) [27.8]	D (D) [C]	0.72 (0.67) [0.54]			
		WBTR	29.7 (43.1) [23.6]	C (D) [C]	0.50 (0.44) [0.10]			
		NBL	47.4 (94.8) [32.0]	D (F) [C]	0.56 (0.89) [0.28]			
		NBT	33.6 (36.0) [15.7]	C (D) [B]	0.56 (0.45) [0.18]			
		NBR	8.1 (9.8) [6.7]	A (A) [A]	0.28 (0.54) [0.17]			
		SBL	55.1 (64.6) [37.8]	E (E) [D]	0.31 (0.29) [0.25]			
		SBT	38.5 (59.5) [19.9]	D (E) [B]	0.41 (0.86) [0.24]			
		SBR	35.9 (40.3) [19.2]	D (D) [B]	0.02 (0.07) [0.00]			

* Unsignalized Intersection

4.0 YEAR 2040 FUTURE BUILD CONDITIONS

4.1 Development of the Recommended Design

As discussed in the previous section, five of the nine study intersections will require mitigation, as they do not provide adequate LOS under future year 2040 traffic conditions. All study intersections with failing LOS extend from Teague Road south. This section of Ridge Road generally has a two-lane cross-section that will become inadequate by the 2040 design year. The recommended design is for a five-lane cross-section through this segment of the corridor, with the center lane serving as a median and a left-turn lane.

In addition to the need to improve traffic, bicycle and pedestrian infrastructure will need to be upgraded to County standards. Pedestrian and bicycle infrastructure is currently limited throughout the Ridge Road corridor. The projected residential and commercial growth along the corridor further emphasizes the need to upgrade pedestrian and bike facilities. Accordingly, the recommended design also provides continuous pedestrian and bike facilities along the entire corridor.

4.2 Preliminary Engineering for Preferred Alternative

Concept plans were developed for the Recommended Design in order to come up with cost estimates and better estimate necessary right-of-way acquisitions, utility relocations, and environmental impacts. Detailed concept plans of the Recommended Design are provided in Appendix E.

The concept plans show important features such as proposed resurfacing, pavement, sidewalk, and green space areas, pavement areas to be removed, property lines, guardrail, overhead electric lines, inlets, signal poles, pole-mounted control cabinets, fire hydrants, ground-mounted signs, light poles, utility poles, bus stops, and existing and proposed lane configurations/pavement markings.

4.2.1 Proposed Roadway Geometry and Typical Cross-sections

The proposed roadway geometry for the southern portion of MD 713 from Teague Road to MD 175, is for a five-lane cross-section with two 11ft lanes in each direction and a 12-18 ft median. Additionally, based on the existing speeds[5] along this segment of MD 713, the posted speed limit is recommended to be changed from 45 mph to 35 mph between MD 175 and Arundel Mills Blvd. North of Teague Road to the study area boundary at Dorsey Road, roadway geometry will remain unchanged from the existing conditions. Additional turn lanes were recommended at select locations to mitigate unacceptable traffic conditions. Detailed description of all proposed roadway improvements and cross-sections ensue.

[5] Speeds were evaluated between Watts Ave and Bear Paw Lane. The average speeds were 34 mph southbound and 37 mph northbound. The 85th Percentile speeds were 40 mph southbound and 43 mph northbound.

4.2.1.1 From MD 175 to Christiana Ct.

This segment is about 300 feet long and constitutes the north leg of the intersection of Ridge Road and MD 175. It represents the transition from primarily residential land use to the mixed commercial land use found at this intersection. As shown in the figure below, the typical cross-section constitutes:

- 2 southbound through lanes
- 1 dedicated southbound right turn lane
- Double-left southbound turn lanes
- 2 northbound through lanes
- 1 dedicated northbound right turn lane
- 5' in-road northbound and southbound bike lanes
- Sidewalk along the east side, separated from traffic with a 3' grass buffer for signage and to provide additional separation between the pedestrians and vehicles.
- A wide grass swale median to accommodate stormwater

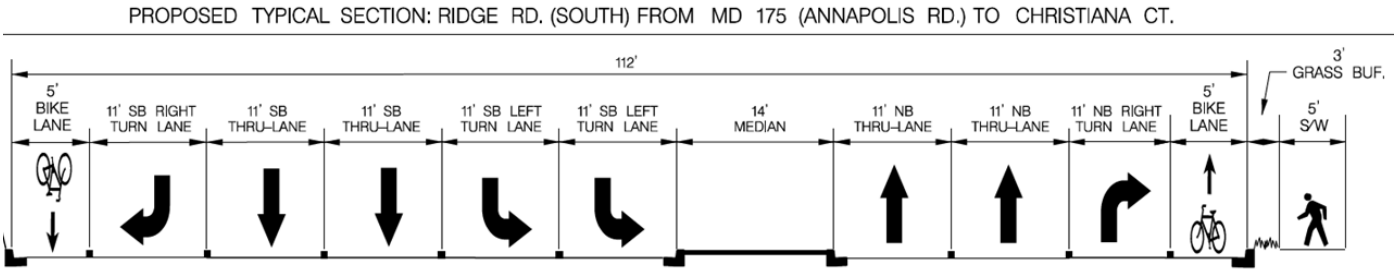


Figure 5: Proposed Cross-section for Ridge Road from MD 175 to Christiana Ct

The proposed curb to curb width is 112 feet, with 120 feet needed to accommodate all uses.

4.2.1.2 From Christiana Ct to Watts Ave/Ridge Forest Way.

This segment is about 1 ¼ miles long and traverses low density residential land use. As shown in the figure below, the typical cross-section constitutes:

- 2 southbound through lanes
- 2 northbound through lanes
- 5' in-road northbound and southbound bike lanes
- Sidewalk along the east side, separated from traffic with a 3' grass buffer for signage and to provide additional separation between the pedestrians and vehicles.
- A wide grass swale median to accommodate stormwater

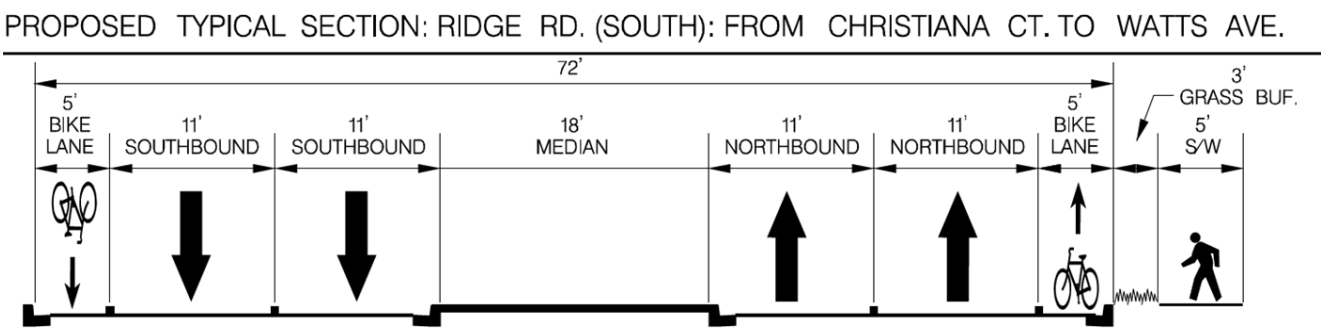


Figure 6: Proposed Cross-section for Ridge Road from Christiana Ct to Watts Ave.

The proposed curb to curb width is 72 feet, with 80 feet needed to accommodate all uses. There are eight intersections with Ridge Road along this section, with turn bays proposed at the following locations:

- Christiana Ct: 1 southbound left turn bay
- Galetown Ct: 1 southbound left turn bay and 1 northbound right turn bay
- Stone Castle Drive: 1 southbound left turn bay, 1 northbound left turn bay, and 1 northbound right turn bay
- Pometacom Dr: 1 northbound left turn bay
- Bastille Pl: 1 southbound left turn bay
- Severn Road: 2 southbound left turn bays, 1 northbound left turn bay,
- Cameron Ridge Road: No bays
- Watts Ave: 1 southbound left turn bay, 1 northbound left turn bay

4.2.1.3 From Watts Ave/Ridge Forest Way to Bear Paw Lane

This segment is about ¼ miles long and traverses low density residential land use on the east side and medium density residential use on the west side. As shown in the figure below, the typical cross-section constitutes:

- 2 southbound through lanes
- 2 northbound through lanes
- 5' in-road northbound and southbound bike lanes
- Sidewalk along the east and west sides, separated from traffic with a 3' grass buffer for signage and to provide additional separation between the pedestrians and vehicles.
- A wide grass swale median to accommodate stormwater

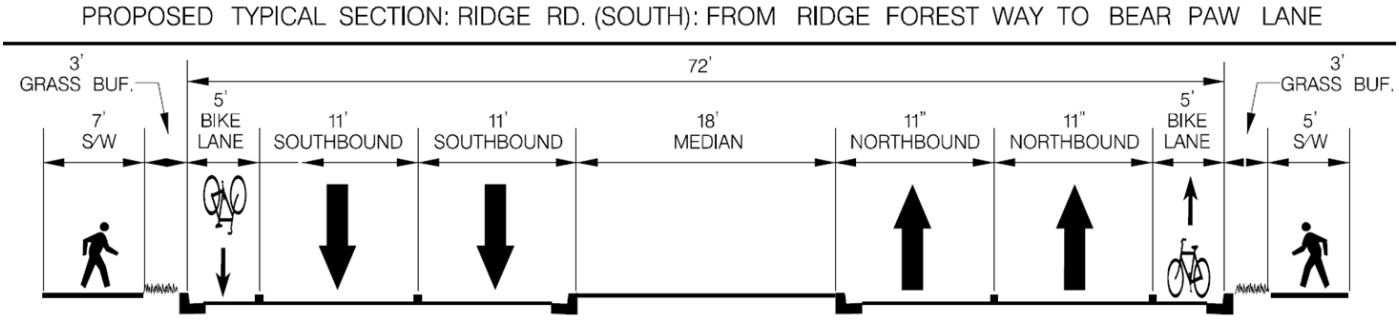


Figure 7: Proposed Cross-section for Ridge Road from Watts Ave to Bear Paw Ln.

The proposed curb to curb width is 72 feet, with 90 feet needed to accommodate all uses. There are two intersections and two residential driveways along this section of Ridge Road. Only Stoney Run Drive (south) has a dedicate turn lane access, via a short two-way left turn lane. This lane is existing and is proposed to remain.

4.2.1.4 From Bear Paw Lane to Stoney Run Dr

This segment is about 700 feet long and traverses low density residential land use on the east side and medium density residential use on the west side. As shown in the figure below, the typical cross-section constitutes:

- 2 southbound through lanes
- 2 northbound through lanes
- 5' in-road northbound and southbound bike lanes
- Sidewalk along the east and west sides, separated from traffic with a 7' grass buffer for signage (from Thames River to Stoney Run, the buffer is 3' wide) and to provide additional separation between the pedestrians and vehicles.
- A wide grass swale median to accommodate stormwater

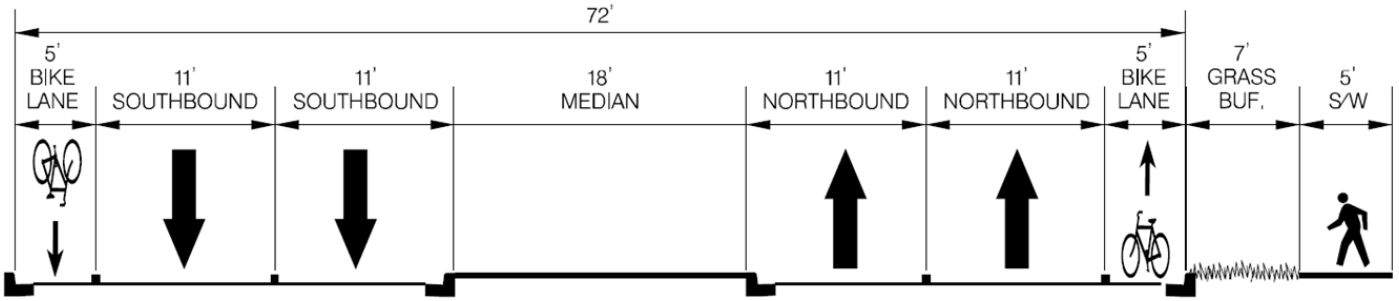


Figure 8: Proposed Cross-section for Ridge Road from Bear Paw Lane to Stone Run Dr.

The proposed curb to curb width is 72 feet, with 84 feet needed to accommodate all uses. There is intersection in this segment – Thames River Drive, and no turn bays along Ridge Road are proposed.

4.2.1.5 From Stoney Run Drive to Teague Road

This segment is about 650 feet long and traverses low density residential land use on the east side and commercial development west side. The proposed typical cross-section is similar to the existing cross-section; only two 5-foot bike lanes have been added and the outside southbound lane is reconfigure from a right-only to a through-right lane. As shown in the figure below, the typical cross-section constitutes:

- 2 southbound through lanes
- 3 northbound through lanes
- 1 northbound right-only lane
- 5' in-road northbound and southbound bike lanes
- 8' Sidewalk along the west side, separated from traffic with a 3' grass buffer for signage and to provide additional separation between the pedestrians and vehicles.
- A grass swale median to accommodate stormwater

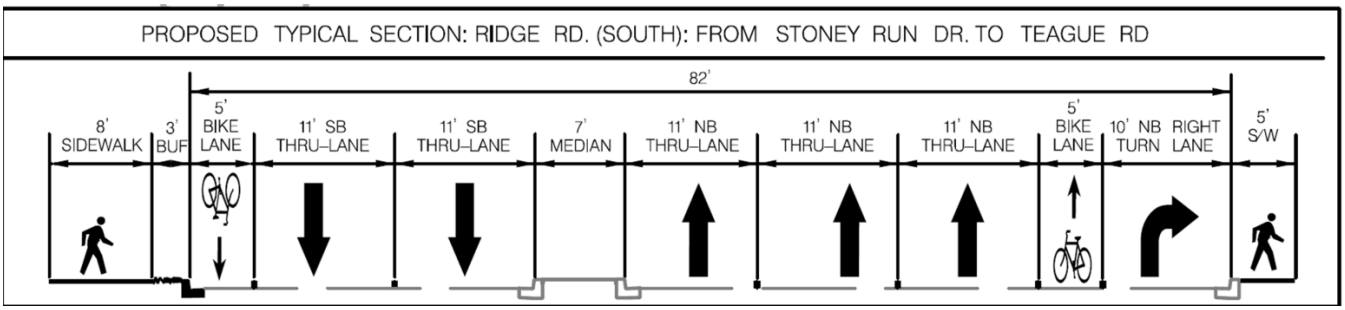


Figure 9: Proposed Cross-section for Ridge Road from Stoney Run Dr to Teague Rd.

The proposed curb to curb width is 82 feet, with 93 feet needed to accommodate all uses.

4.2.1.6 From Teague Road to Arundel Mills Blvd

This segment is about 500 feet long and traverses through commercial development. The proposed typical cross-section is identical to the existing cross-section, with the exception that outside of the existing curb on the west side, a 10' share use path is proposed. As shown in the figure below, the typical cross-section constitutes:

- 2 southbound through lanes
- 1 southbound left-turn lane that transitions into a double-left turn lane.
- 1 northbound through lane
- 1 northbound free right-only lane (auxiliary lane beginning at Teague and ending at Arundel Mills Blvd.)
- 1 northbound left turn lane that transitions into a northbound double-left left turn lane
- 10' multi-use path the west side, separated from traffic with a 3' grass buffer for signage and to provide additional separation between the pedestrians and vehicles.
    - A narrower path with a variable width grass buffer is present currently.
- The existing median is to remain

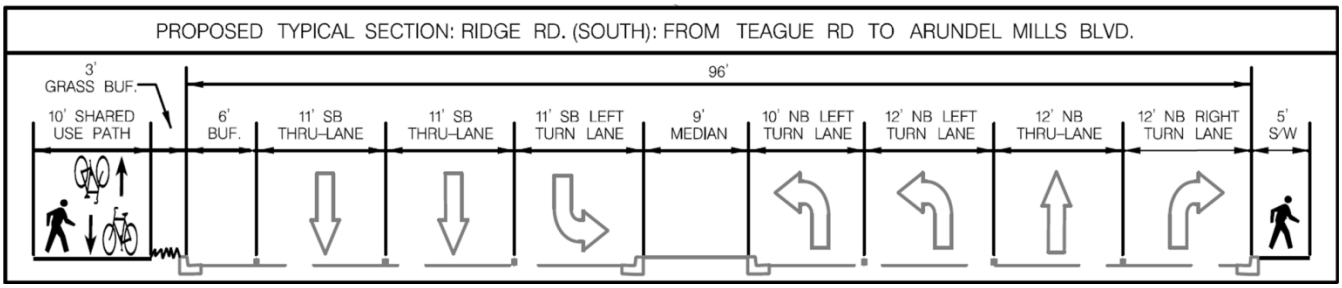


Figure 10: Proposed Cross-section for Ridge Road from Teague Rd to Arundel Mills Blvd.

The proposed curb to curb width is 96 feet, with 109 feet needed to accommodate all uses.

4.2.1.7 From Arundel Way to Bass Pro Dr

This segment is about 1000 feet long and traverses through commercial development. The proposed typical cross-section is identical to the existing cross-section, with the exception that outside of the existing curb on the east side, a 10' share use path is proposed. As shown in the figure below, the typical cross-section constitutes:

- 1 southbound right only lane

- 2 southbound through lanes
- 3 southbound left-turn lanes
- 3 northbound through lanes
- 1 northbound free right-only lane (auxiliary lane beginning at Arundel Way and ending at Bass Pro Drive)
- 10’ multi-use path the west side, separated from traffic with a 3’ grass buffer for signage and to provide additional separation between the pedestrians and vehicles.
- The existing variable width median is to remain

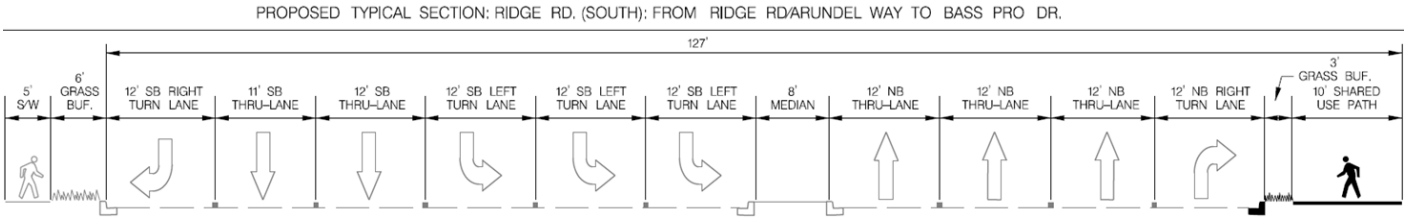


Figure 11: Proposed Cross-section for Arundel Mills Blvd to Bass Pro Dr.

The proposed curb to curb width is 127 feet, same as existing, with 140 feet needed to accommodate all uses.

4.2.1.8 From Bass Pro Dr to MD 100 WB ramps

This segment is about ¼ mile long and traverses through undeveloped land used for highway access. The proposed typical cross-section is identical to the existing cross-section, with the exception that outside of the existing curb on the east side, a 10’ share use path is proposed. As shown in the figure below, the typical cross-section constitutes:

- 1 southbound right only lane
- 3 southbound through lanes
- 1 southbound left-turn lane
- 2 northbound left turn lanes
- 3 northbound through lanes
- 10’ multi-use path the west side, separated from traffic with a 3’ grass buffer for signage and to provide additional separation between the pedestrians and vehicles.
    - This path will require a retaining wall
- The existing median is to remain

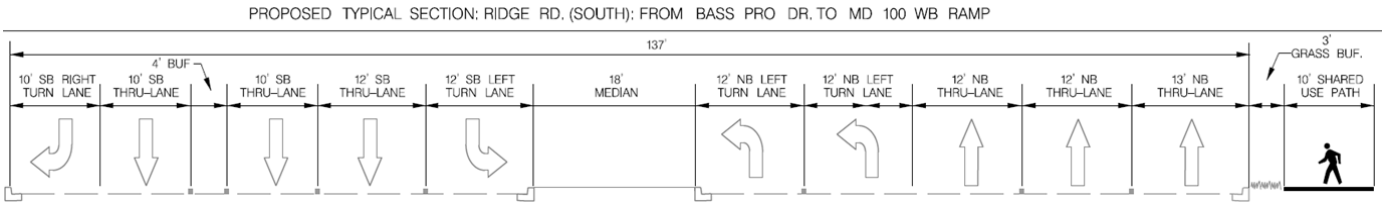


Figure 12: Proposed Cross-section for Bass Pro Dr to westbound MD 100 ramps.

The proposed curb to curb width is 137 feet, same as existing, with 150 feet needed to accommodate all uses.

4.2.1.9 From MD 100 WB ramps to Dorsey Road (MD 176)

This segment is about 750 feet long and traverses through undeveloped land. The proposed typical cross-section is identical to the existing cross-section, with the exception that outside of the existing curb on the east side, a 10' share use path is proposed. As shown in the figure below, the typical cross-section constitutes:

- 1 southbound right only lane
- 3 southbound through lanes
- 2 northbound left turn lanes
- 2 northbound through lanes
- 1 northbound right-only lane
- 10' multi-use path the west side, separated from traffic with a 3' grass buffer for signage and to provide additional separation between the pedestrians and vehicles.
    - This path will require a retaining wall
- The existing variable-width median is to remain

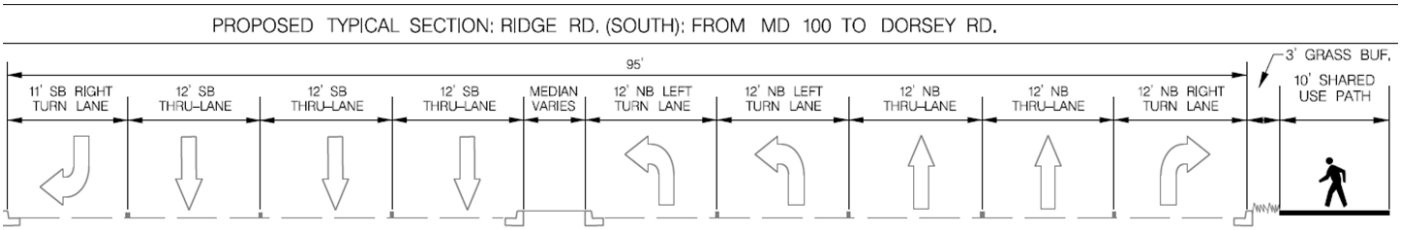


Figure 13: Proposed Cross-section for westbound MD 100 ramps to Dorsey Road.

The proposed curb to curb width is 95 feet, same as existing, with 108 feet needed to accommodate all uses.

4.2.1.10 Additional intersection-related improvements

As discussed previously, the recommended alternative developed for this southern segment of Ridge Road (south of Stoney Run Drive) recommends a continuous five-lane cross-section south to MD 175. In addition to the five-lane segment, some intersections required additional turn bays and signal/geometric to achieve an acceptable LOS. These improvements include:

1. Pedestrian Crossings at multiple locations. The recommend design also requires crosswalks to be striped across the eastern leg of each intersection from Arundel Mills Boulevard to Dorsey Road, including the MD 100 Ramps. A pedestrian signal will be installed to accommodate the new controlled crossings at:
    - Arundel Mills Boulevard,
    - MD 100 eastbound ramps, and;
    - MD 100 westbound ramps.

2. *Ridge Road at Stone Castle Drive*: Recommended changes include:
    - Signalization of intersection.

3. *Ridge Road at Severn Avenue*: Recommended changes include:
    - Additional southbound left travel lane
4. *Ridge Road at Watts Avenue*: Recommended changes include:

- Realignment of the east-west legs and removal of split phasing.

5. *Ridge Road at Teague Road*: Recommended changes include
   - The addition of one westbound left turn lane and introduction of split signal phasing.
6. Ridge Road at MD 175: Recommended changes include:
   - Lane reconfigurations to accommodate the removal of north-south split phasing
   - Additional southbound left turn lane and right turn lane,
   - Additional eastbound through lane and westbound through lane.

Based on the recommended cross-sections and intersection-specific improvements, the expected lane configuration is shown in Figure 14.

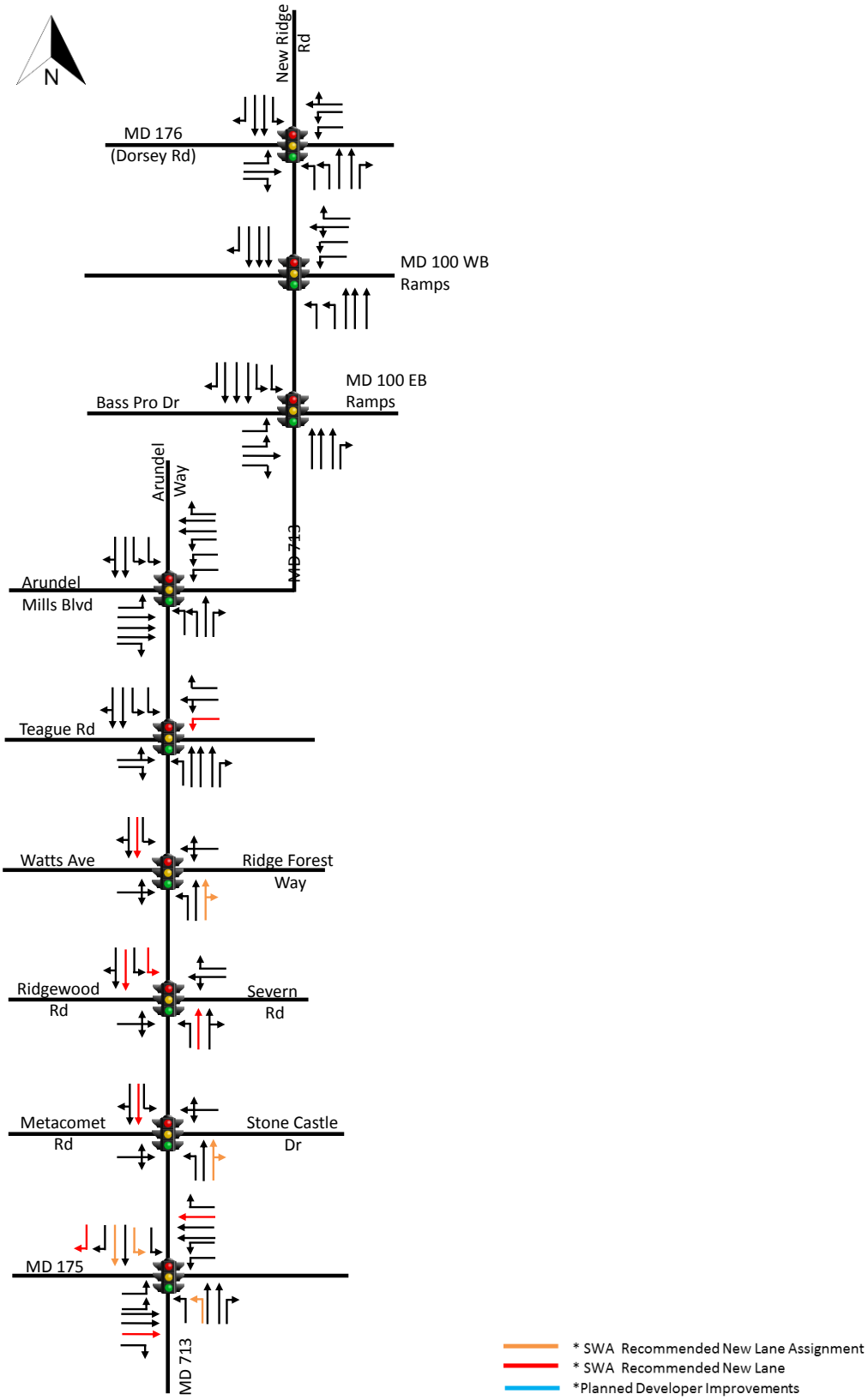


Figure 14: Future Year 2040 Build Alternative 1 Intersection Lane Configurations

4.2.2 Year 2040 Capacity Analysis – Recommended Design

A capacity analysis performed for the recommended lane configuration shown in Figure 14.

All of the improvements shown were effective at bringing traffic conditions to an acceptable level for all of the study intersection with the exception of the intersection at Ridge Road and MD 175. Mitigations result in an improvement in overall LOS from F to E and E to D during the weekday AM and Saturday peak hours, respectively. However, the intersection still operates at a failing Level of Service during the PM peak hour with an average overall vehicle delay of 79.3 seconds. Table 5 shows results of the HCM and CLV analysis of the recommended design.

Additionally the recommended lane configuration was evaluated for its effect on queue reductions. Excessive queuing throughout the network, observed in the 2040 No-Build scenario, is mitigated as roadway improvements successfully relieve the bottleneck at Watts Avenue during the morning, afternoon, and Saturday peak hours. However, long queues in excess of 1,000ft were still observed on the westbound approach of the intersection of MD 175 at Ridge.

Detailed CLV worksheets and Synchro HCM reports are in Appendix B and C, respectively. The 95th percentile queue lengths for the 2040 No-Build scenario and Recommended Design are shown in Appendix E.

The large increase in anticipated traffic volume at the intersection of MD 175 and Ridge Road causes heavy westbound queuing and failing LOS in the PM peak hour scenario even with substantial at-grade geometric improvements. Non-traditional intersection improvements were evaluated in Section 4.2.2.1[6]. Additionally, prior discussion with Anne Arundel County and SHA noted that the portion of Ridge Road from the MD 100 Westbound Ramps to Arundel Way, while sufficient from a traffic operations standpoint, contains difficult weaving maneuvers and often results in inefficient lane utilization. In section 4.2.2.2, we explore potential geometric improvements to alleviate these conditions.

[6] A non-traditional at-grade intersection was evaluated, so as to minimize the expense and ROW needs required of an interchange.

Table 5: Intersection Capacity Analysis Results for the Year 2040 Recommended Design

#	Intersection	Movement	2040 Alternative 1 AM (PM) [Sat]					
			Delay/Veh (sec)	Level of Service	Volume/Capacity Ratio	Critical Lane Volume	Level of Service	Volume/Capacity Ratio
1	MD 713 at MD 175	**Overall**	**63.8 (79.3) [36.9]**	**E (F) [D]**	**1.10 (1.10) [0.76]**	**1608 (1998) [1324]**	**F (F) [D]**	**1.01 (1.25) [0.83]**
		EBL	66.1 (115.3) [65.3]	E (F) [E]	0.64 (1.08) [0.83]			
		EBT	27.1 (58.5) [17.0]	C (E) [B]	0.54 (1.01) [0.45]			
		EBR	0.7 (0.1) [0.1]	A (A) [A]	0.37 (0.11) [0.09]			
		WBL	71.7 (129.0) [72.2]	E (F) [E]	0.71 (0.96) [0.51]			
		WBT	69.0 (105.0) [37.1]	E (F) [D]	1.04 (1.10) [0.74]			
		WBR	0.2 (0.6) [0.4]	A (A) [A]	0.12 (0.36) [0.28]			
		NBL	137.7 (69.2) [73.4]	F (E) [E]	1.07 (0.84) [0.66]			
		NBT	65.5 (140.9) [76.8]	E (F) [E]	0.27 (1.10) [0.57]			
		NBR	50.8 (57.4) [63.3]	D (E) [E]	0.04 (0.46) [0.04]			
		SBL	77.5 (128.5) [64.8]	E (F) [E]	0.89 (1.09) [0.78]			
		SBT	122.7 (64.2) [57.7]	F (E) [E]	1.07 (0.50) [0.33]			
		SBR	87.2 (40.1) [37.5]	F (D) [D]	1.01 (0.45) [0.46]			
2	MD 713 at Metacomet Rd	**Overall**	**8.2 (242.2) [3.8]**	**A (A) [A]**	**0.73 (0.65) [0.39]**	**1154 (1166) [703]**	**C (C) [A]**	**0.72 () []**
		EBLTR	52.4 (61.4) [59.8]	D (E) [E]	0.06 (0.13) [0.11]			
		WBLTR	68.2 (64.3) [64.9]	E (E) [E]	0.69 (0.38) [0.50]			
		NBL	5.0 (1.7) [1.4]	A (A) [A]	0.12 (0.11) [0.06]			
		NBTR	3.0 (3.3) [2.0]	A (A) [A]	0.24 (0.67) [0.38]			
		SBL	1.0 (17.4) [0.4]	A (B) [A]	0.03 (0.57) [0.07]			
		SBTR	5.2 (1.3) [0.5]	A (A) [A]	0.73 (0.40) [0.36]			
3	MD 713 at Severn Rd	**Overall**	**52.0 (44.2) [38.9]**	**D (D) [D]**	**0.98 (0.96) [0.79]**	**1363 (1345) [967]**	**D D A**	**0.85 0.84 0.60**
		EBLTR	66.1 (70.6) [68.5]	E (E) [E]	0.37 (0.47) [0.38]			
		WBLT	81.2 (83.5) [73.4]	F (F) [E]	1.02 (0.87) [0.81]			
		WBR	37.9 (86.4) [67.9]	D (F) [E]	0.87 (1.03) [0.97]			
		NBL	68.0 (80.8) [65.3]	E (F) [E]	0.21 (0.38) [0.21]			
		NBT	43.1 (46.3) [32.8]	D (D) [C]	0.67 (0.94) [0.65]			
		NBR	16.3 (27.9) [23.0]	B (C) [C]	0.07 (0.66) [0.15]			
		SBL	42.6 (51.5) [62.0]	D (D) [E]	0.39 (0.79) [0.59]			
		SBTR	53.3 (19.9) [6.6]	D (B) [A]	0.97 (0.59) [0.42]			
4	MD 713 at Watts Ave/Ridge Forest Way	**Overall**	**9.8 (16.8) [6.1]**	**A (B) [A]**	**0.47 (0.79) [0.52]**	**813 (1277) [919]**	**A C A**	**0.51 0.80 0.57**
		EBLTR	61.1 (50.6) [62.1]	E (D) [E]	0.06 (0.15) [0.05]			
		WBLTR	60.9 (71.1) [61.8]	E (E) [E]	0.05 (0.68) [0.03]			
		NBL	3.9 (26.2) [3.8]	A (C) [A]	0.11 (0.48) [0.03]			
		NBTR	8.5 (6.9) [5.3]	A (A) [A]	0.51 (0.83) [0.57]			
		SBL	2.1 (27.2) [1.2]	A (C) [A]	0.05 (0.54) [0.17]			
		SBTR	4.8 (19.8) [2.4]	A (B) [A]	0.46 (0.79) [0.47]			
5	MD 713 at Teague Rd	**Overall**	**31.6 (48.1) [32.1]**	**C (D) [C]**	**0.59 (0.96) [0.62]**	**901 (1166) [1034]**	**A C B**	**0.56 0.73 0.65**
		EBLT	61.5 (100.0) [67.4]	E (F) [E]	0.50 (0.93) [0.70]			
		EBR	56.9 (54.1) [55.7]	E (D) [E]	0.05 (0.09) [0.16]			
		WBL	57.8 (44.3) [61.3]	E (D) [E]	0.61 (0.54) [0.57]			
		WBLT	57.6 (43.4) [58.5]	E (D) [E]	0.60 (0.53) [0.53]			
		WBR	51.4 (94.8) [55.4]	D (F) [E]	0.26 (1.00) [0.13]			
		NBL	12.4 (67.5) [14.9]	B (E) [B]	0.35 (0.88) [0.51]			
		NBT	21.7 (25.0) [22.9]	C (C) [C]	0.56 (0.81) [0.65]			
		NBR	6.8 (42.7) [40.1]	A (D) [D]	0.08 (0.23) [0.06]			
		SBL	53.9 (76.9) [39.4]	D (E) [D]	0.70 (0.78) [0.20]			
		SBTR	17.4 (32.0) [24.6]	B (C) [C]	0.43 (0.96) [0.63]			

4.2.2.1 Ridge Road at MD 175 – Displace Left Turn Intersection

In an effort to increase capacity and reduce vehicle delay configuration at Ridge Road and MD 175, an atypical intersection design was evaluated. A Displaced Left-Turn (DLT) would allow the left turns along to MD 175 to have a protected left turn phase that would run concurrently with the MD175 through phase, therefore providing a reduction of one vehicle phase. One signalized intersection, effectively becomes three, with the eastbound and westbound traffic (MD 175 *through* traffic) coordinated, as shown in Figure 15.

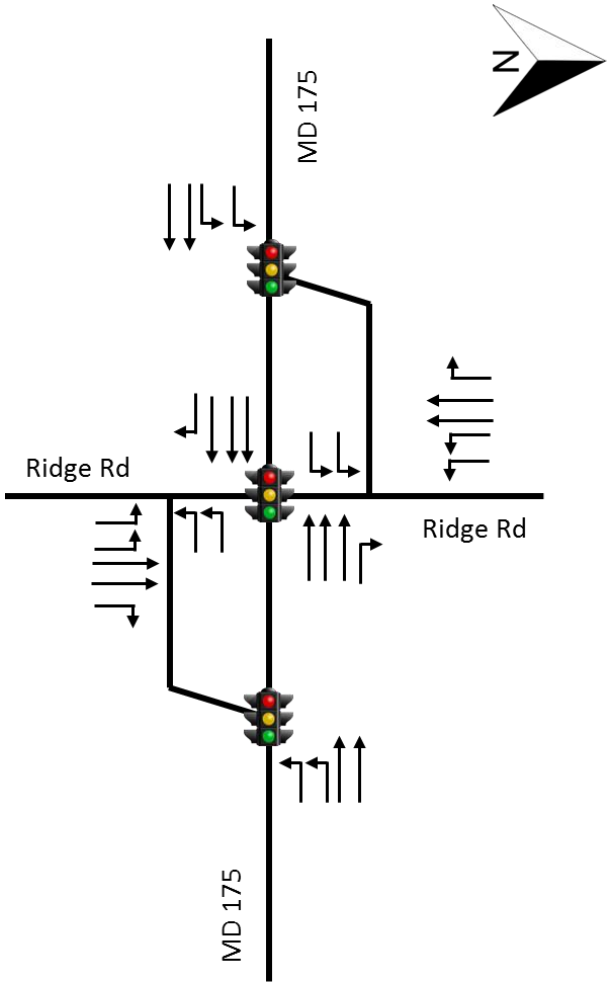


Figure 15: Displaced Left-Turn Intersection Lane Configuration

The DLT, along with the removal of north-south split phasing was evaluated for capcity improvements. As shown in Table 6, this configuration results in an improvement in overall LOS from F to C during the weekday AM peak hour, F to D during the PM peak hour, and E to C during the Saturday peak hour.

The DLT design will increase the footprint of the existing roadway and impact site access points for future and existing developments around Ridge Road and MD 175. Existing and planned driveways will need to be consolidated, and turning movements restricted to right-in and right-out in many cases. Primary site access points would need to be relocated to locations that are outside of the three signals associated with a displaced left-turn intersection.

Table 6: Displaced Left-turn Intersection Capacity Analysis Results

#	Intersection	Movement	2040 CFI AM (PM) [Sat]		
			Delay/Veh (sec)	Level of Service	Volume/Capacity Ratio
1	MD 713 at MD 175	**Overall**	**28.3 (35.1) [25.6]**	**C (D) [C]**	**0.90 (0.97) [0.65]**
		EBL	0.3 (9.4) [12.4]	A (A) [B]	0.14 (0.45) [0.35]
		EBT	21.1 (37.5) [26.1]	C (D) [C]	0.48 (0.95) [0.56]
		EBR	0.6 (0.1) [0.1]	A (A) [A]	0.37 (0.12) [0.09]
		WBL	13.4 (37.9) [10.5]	B (D) [B]	0.13 (0.08) [0.05]
		WBT	33.1 (25.1) [28.6]	C (C) [C]	0.89 (0.67) [0.68]
		WBR	0.1 (0.5) [0.4]	A (A) [A]	0.12 (0.37) [0.30]
		NBL	66.9 (62.2) [56.9]	E (E) [E]	0.67 (0.74) [0.32]
		NBT	54.5 (93.9) [51.7]	D (F) [D]	0.13 (0.95) [0.12]
		NBR	0.1 (0.2) [0.1]	A (A) [A]	0.05 (0.16) [0.05]
		SBL	69.1 (93.8) [65.8]	E (F) [E]	0.83 (0.99) [0.82]
		SBT	66.5 (60.7) [48.7]	E (E) [D]	0.82 (0.43) [0.24]
		SBR	1.3 (0.5) [0.5]	A (A) [A]	0.54 (0.30) [0.31]
2	MD 175 East of MD 713	**Overall**	**5.4 (9.4) [2.7]**	**A (A) [A]**	**0.82 (0.89) [0.68]**
		EBT	3.3 (8.9) [0.7]	A (A) [A]	0.51 (0.91) [0.53]
		WBL	49.8 (49.8) [50.9]	D (D) [D]	0.32 (0.22) [0.13]
		WBT	1.6 (1.2) [0.9]	A (A) [A]	0.76 (0.70) [0.63]
		NBR	47.9 (69.7) [1.4]	D (E) [D]	0.04 (0.75) [0.19]
3	MD 713 West of MD 713	**Overall**	**3.7 (12.8) [9.4]**	**A (B) [A]**	**0.69 (0.87) [0.61]**
		EBL	69.1 (58.6) [63.1]	E (E) [E]	0.68 (0.86) [0.82]
		EBT	0.6 (2.0) [0.4]	A (A) [A]	0.55 (0.80) [0.45]
		WBT	0.5 (11.9) [2.0]	A (B) [A]	0.69 (0.74) [0.54]
		SBR	1.1 (0.4) [0.5]	A (A) [A]	0.53 (0.29) [0.30]

In lieu of the displaced left-turn intersection design, a grade-separated design should also be considered at the Ridge Road and MD 175 intersection. Based on the DLT's ability to improve intersection capacity, while still remaining at-grade, its design was advanced in the Preliminary Engineering drawings shown in Appendix E.

4.2.2.2 Ridge Road at Arundel Mills Boulevard – Operations Improvement

Consideration was given to improving the weaving section between the MD 100 eastbound ramp and the Arundel Way at Ridge Road intersection. There is currently a high demand for from vehicles exiting the MD 100 eastbound and westbound ramps, heading south, to make a southbound left turn at the intersection of Arundel Way at Ridge Road. This demand is forecasted to be even greater by the 2040 design year. Because these intersections are closely-spaced, this weaving maneuver results in aggressive driving behaviors and an uneven lane utilization for the southbound through movements north of the intersection.

Figure 16 shows the existing conditions and the improved concept for the weaving section.

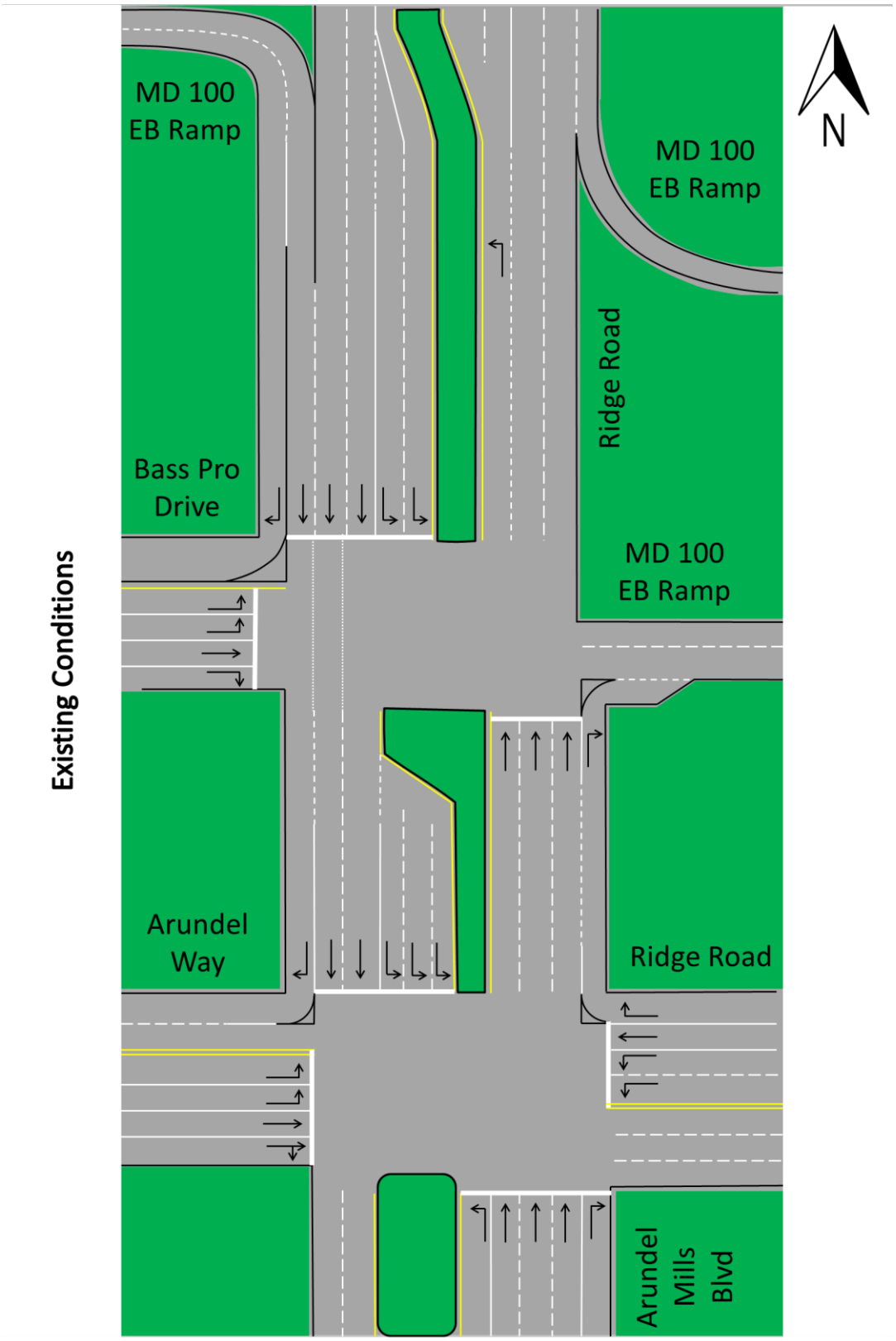


Figure 16: Existing Ridge Road at Arundel Mills Boulevard Weaving Section

An improved design would extend the southbound left turn lane at the Arundel Mills Boulevard intersection through the median to create an additional receiving lane for the southbound through movement at Bass Pro Drive. Figure 17 shows the improved design. The additional receiving lane would provide access to the two inside most southbound left turn lanes at Arundel Mills Boulevard, and changes in pavement markings will provide access into the outside southbound left turn lane from the inside through lane.

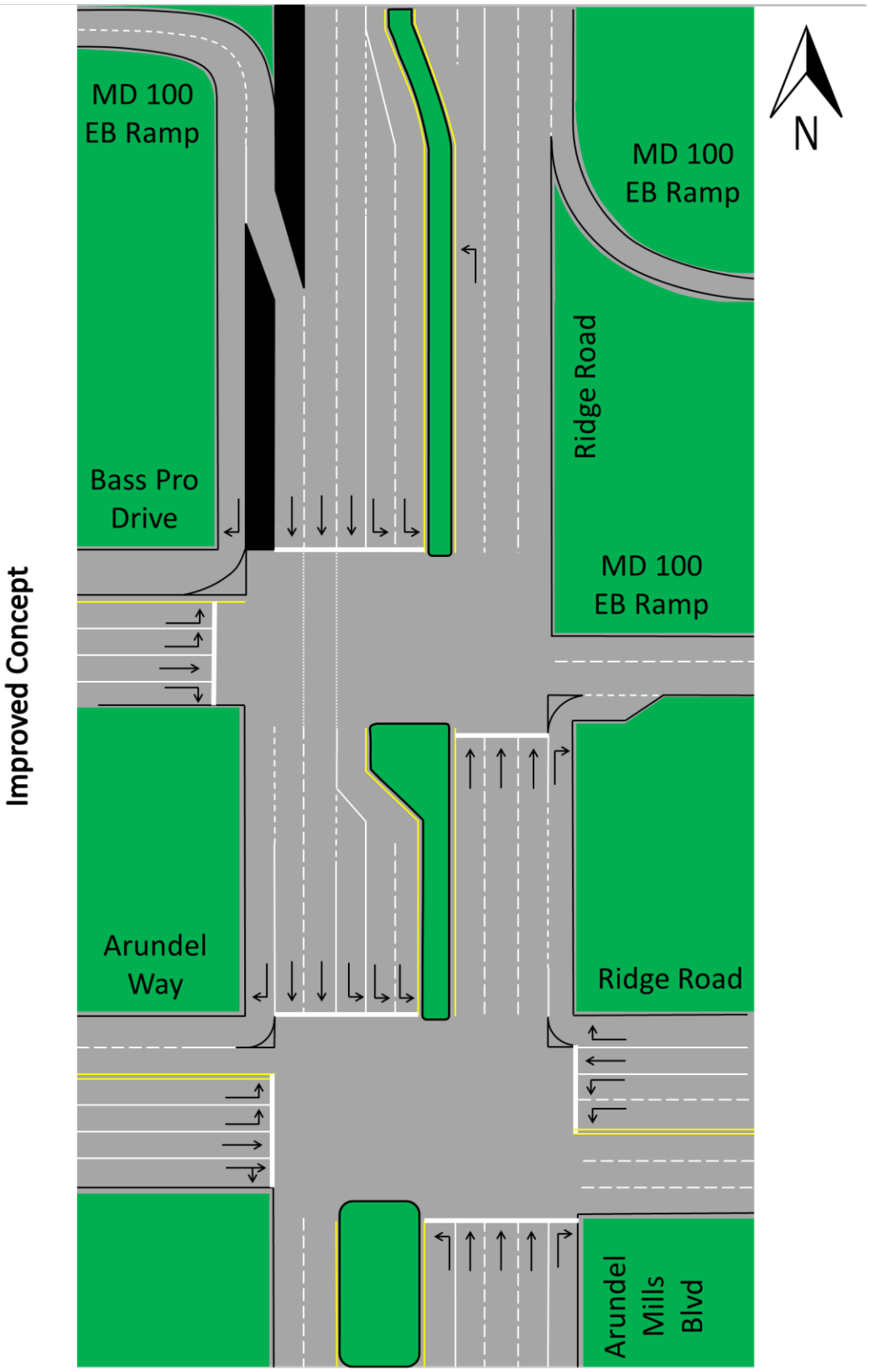


Figure 17: Improved Ridge Road at Arundel Mills Boulevard Weaving Section

This design concept would result in:

- A reduction in the number of lane changes for vehicles attempting the weaving movement from two to one lane change
- A more even lane utilization in the southbound directions at intersections north of Arundel Mills Boulevard resulting in increased efficiency.
- An increase in storage space for the southbound left turning movement at the Arundel Mills Boulevard intersection

The design concept illustrated in Figure 17 would require a realignment of the southbound approach at Bass Pro Drive. This realignment would entail extending the median separating the MD 100 eastbound ramp from the mainline southbound Ridge Road, and removal of a portion of the center median separating north and southbound traffic.

Further analysis is required to quantify the operational benefits of the proposed concept. Accordingly, this design was not advanced into Preliminary Engineering.

4.2.3 Pedestrian and Bike Improvements

Expansion of the existing pedestrian and bicycle infrastructure is recommended as part of the Recommended Design.

From MD 175 to Teague Road, the Preferred Alternative recommends a combination of dedicated bike lanes and sidewalks. Additionally, the speed limit is recommended to be reduced from 45 mph to 35 mph. North of Teague Road to MD 176 , a shared-use path is recommended due to the higher speeds and volumes attained on this segment. Details of the pedestrian/bicycle infrastructure for each segment are provided below (refer to the cross-section figures in the previous sub-section):

MD 175 to Watts Avenue/Ridge Forest Way

- 5’ dedicated bike lanes are provided on each side of MD 713
- A 5’ sidewalk with a 3’ grass buffer is provided on the east side of MD 713

Watts Avenue/Ridge Forest Way to Bear Paw Lane

- 5’ dedicated bike lanes are provided on each side of MD 713
- A 5’ sidewalk with a 3’ grass buffer is provided on the east side of MD 713
- A 7’ sidewalk with a 3’ grass buffer is provided on the west side of MD 713

Bear Paw Lane to Thames River Drive

- 5’ dedicated bike lanes are provided on each side of MD 713
- A 5’ sidewalk with a 7’ grass buffer is provided on the east side of MD 713

Thames River Drive to Stoney Run Drive

- 5’ dedicated bike lanes are provided on each side of MD 713
- A 5’ sidewalk with a 3’ grass buffer is provided on the east side of MD 713

Stoney Run Drive to Teague Road

- 5’ dedicated bike lanes are provided on each side of MD 713
- A 8’ sidewalk with a 3’ grass buffer is provided on the west side of MD 713

Teague Road to Arundel Mills Boulevard

- A 10’ shared-use path with a 3’ grass buffer is provided on the west side of MD 713

Arundel Way to Dorsey Road

- A 10’ shared-use path with a 3’ grass buffer is provided on the east side of MD 713

4.3 Stormwater

For the northern portion of Ridge Road/MD 713 from Stoney Run Drive north to Dorsey road (0.80 miles), existing curbs are largely expected to be held in place, with the only increase in impervious pavement due to widened or new sidewalk. Minimal stormwater management systems are expected for this portion. South of Stoney Run Drive (remaining 1.8 miles), stormwater management requirements are expected to be met via the grass swale medians shown in the concept plans (i.e. the green shading). Grass swales are grass-lined channels that convey stormwater runoff, provide water quality treatment and infiltration. They help remove pollutants through vegetative filtering, sedimentation, biological uptake, and infiltration into the underlying soil. The linear nature of grass swales make them suited for placement along roadway medians. The grass-lined channels prevent the need for dual swales along both the east and west side of the corridor, preventing further ROW and easement needs. Additionally, the proposed buffers between the sidewalk and travel lanes will also provide some minimal stormwater infiltration from the sidewalk.

4.4 Environmental

There are no known environmental (e.g. wetlands, protected forests, etc.) areas disturbed by the Recommended Design.

4.5 Right-of-Way Acquisition

Roadway improvements along the Ridge Road corridor include the addition of sidewalk and bicycle facilities, to improve pedestrian and bicycle safety and connectivity, as well as the addition of travel lanes to meet the Anne Arundel County guidelines of LOS D or better at all study intersections. These roadway improvements will increase the footprint of the roadway and require the acquisition of right-of-way along sections of the corridor.

The total additional Right-of-Way required to construct the preferred roadway design is 3 acres.

4.6 Cost Estimate

Construction cost estimates were developed for the Recommended Design using SHA’s Major Quantities Estimates methodology. Major Quantities Estimates are used to estimate construction costs during the planning stage and early in the preliminary engineering stage. The idea is to estimate as accurately as possible those categories that can be estimated in the very early stages such as Grading, Paving, Structures and Shoulders items and compute the remaining categories as percentages of those categories. A total of ten categories were used for estimates.

The estimated construction cost along the corridor is $21 million, which assumes full depth-reconstruction from MD 175 to Stoney Run. Maintenance of Traffic (MOT) through construction phasing was estimated at a rate of 5% of total construction costs for a total of $865,000. Right of Way acquisition was based on $5/SF for residential and $20/SF for commercial lane uses for a total of $2.5 million. A retaining wall underneath MD 100 to support a multi-use path was estimated to cost about $1 million to construct. A detailed cost estimate break down is provided in Appendix F.

The cost estimate provided for the Recommended Design does not include relocation of underground utility costs, however, a generous contingency budget was assumed in the final construction cost estimate to account for known and unknown buried utilities.

5.0 SUMMARY AND RECOMMENDATIONS

The Recommended Design accommodates future projected traffic along with corridor while also improving pedestrian and bike facilities and accommodating stormwater management needs. The intersection of MD 175 and Ridge Road is expected to see substantial traffic growth that cannot be accommodated by conventional at-grade intersections. Accordingly a non-conventional intersection was proposed, in lieu of an interchange. The findings and recommendations for the Ridge Road transportation facility planning study are as follows:

- By Year 2040, traffic volumes are expected to double in the southern portion of the corridor, and increase by 50% in the northern area near MD 100.
- Expected growth along the length of the corridor will result in the following study intersections operating at a LOS F overall during weekday AM, weekday PM, or Saturday peak hours under the No-Build 2040 scenario:
  - MD 713 at MD 175
  - MD 713 at Stone Castle Drive
  - MD 713 at Severn Avenue
  - MD 713 at Watts Avenue
  - MD 713 at Teague Road
- A preferred Design concept was developed that includes the following:
  6. Mainline reconstruction, widening, and Dualization with median from MD 175 to Teague Road
     a. Changing the posted speed limit from 45 mph to 35 mph between MD 175 and Arundel Mill Blvd to reflect the residential land uses and to account for prevailing speeds along this segment.
  7. New traffic signal at Stone Castle Drive
  8. Additional turn lanes:
     - Ridge Road at Teague Road
     - Ridge Road at Severn Avenue
  9. If MD 713 at MD 175 is to remain at-grade, a Displace Left-Turn intersection is recommended. Otherwise, the volumes at this intersection will warrant an interchange.
  10. No changes to the typical roadway lane configuration are proposed from Teague Road north to Dorsey Road.

- To improve pedestrian connectivity between residential communities and commercial developments, a new continuous sidewalk is proposed on at least one side of MD 713from MD 175 to Dorsey Road.
- Bicycle improvements recommended for the 2040 design year include continuous on-road bike lanes along the east and west sides of MD 713 between MD 175 and Teague Road. North of Teague Road to the project limits, bicyclists are proposed to utilize a new shared-use path extending to Dorsey Road.
- No stormwater improvements are recommended from Teague to Dorsey Road, as the roadbed is recommended to remain as is; from Teague to MD 175, stormwater management is recommended to be accommodated within a wide center median.
- The total amount of new right-of-way acquisition required under the recommended design for year 2040 is about 3 acres.
- The estimated construction cost for the recommended design is $21 million.

Appendix A:

Ridge Road Travel Demand Forecasting & Validation Memo; Future AWDT

Sabra, Wang & Associates, Inc.
Engineers • Planners • Analysts

MEMORANDUM

To:	Project 15.52 and 15.53 files
From:	Joe Giancarlo, James Bunch. SWAI
Subject:	Anne Arundel County Ridge Road North and South Travel Demand Forecasting Process and Results
Date:	August 10, 2016

This memorandum documents the travel demand forecasting and traffic analysis carried out for the Anne Arundel Transportation Facility Planning – MD 713 Corridor/Ridge Road North and South studies. The purpose of the study is to identify the necessary transportation improvements (roadway, intersections, pedestrian, bicycle etc.) and right of way easements to safely accommodate future travel demand along Ridge Road MD 713 from Corporate Center Drive and New Ridge Road (Northern Section) and Dorsey Road (MD 176) to the Access Control Point (ACP) of Fort George G. Meade (FGGM) at Rockenbach Road (MD 713) south of Annapolis Road (MD 175) (Southern Section). Presently, Ridge Road MD 713 within the confines of the study is classified as a 2 lane minor arterial.

1 Travel Demand Forecasting Process Overview

The analysis uses as a foundation the currently adopted Baltimore Metropolitan Council's Travel 4.4, which incorporates the adopted 16-19 Transportation Improvement Program and Maximize 2040 Long Range Plan Round 8a Cooperative Land Use Forecasts (2010, 2017, 2025, 2035, and 2040 horizon years) received from BMC in September 2015. This section provides a brief summary of the overall BMC Travel 4.4 model, and then describes the subarea analysis process used for the traffic forecasts within the corridor

1.1 Regional BMC Travel Model 4.4

The BMC Travel Model was developed by the Baltimore Metropolitan Council for the Baltimore Regional Transportation Board. Using a "four step", trip-based model it simulates transportation demand, travel patterns and trips (vehicle and transit) on the highway and transit system throughout the modeled region. The BMC 4.4 model flow and steps are shown in Figure 1: BMC Model Flow Chart in simplified form. The network is skimmed initially to get AM peak travel times before the first round of trips are generated and distributed between the TAZs. The mode choice process then determines which modes are used for each trip; based on trip type, income, and disutility functions for each mode. These trips are assigned to the network, followed by another skim. The new skims are used to redistribute and reassign trips twice before the model is run with all time periods. The iterations ensure that the times and costs used as inputs for trip distribution and mode split are consistent with the output in the final run. The regional travel demand model also runs sub-models for determining area type, accessibility, terminal and intrazonal times, parking costs, and air passengers. These are further documented in the Baltimore Region Travel Demand Model 4.0 - 4.4 version model guide (Baltimore Regional Travel Demand Model 4.0 Model Guide, BMC, June 2011), and subsequent model update memorandum and were not modified as part of the Ridge Road Study.

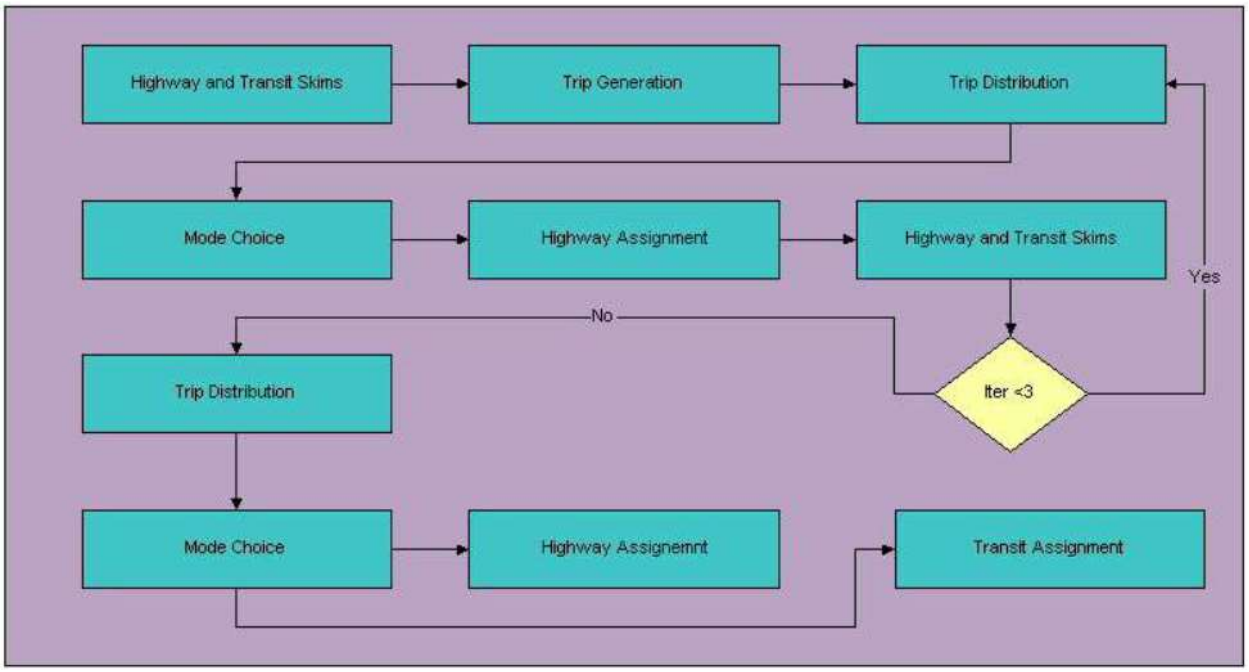


Figure 1: BMC Model Flow Chart

The BMC Regional model area includes Baltimore City and the counties of Anne Arundel, Baltimore, Carroll, Harford, Howard, and in less detail: Prince George's, Montgomery, Frederick, and the District of Columbia. Counties are further subdivided into 1767 internal travel analysis zones (TAZ). In addition there are 42 external stations that account for trips crossing into and from the region. Each TAZ has demographic and travel data that represents the productions and attractions for that area, this is manifested in the centroid of each zone. The highway network is made up of links which are connected by intersection nodes. Links are classified into categories based on their functional type, which determines input speeds, and road type, which determines its capacity. The area covered by the regional model with the Ridge Road subarea highlighted is shown in Figure 2

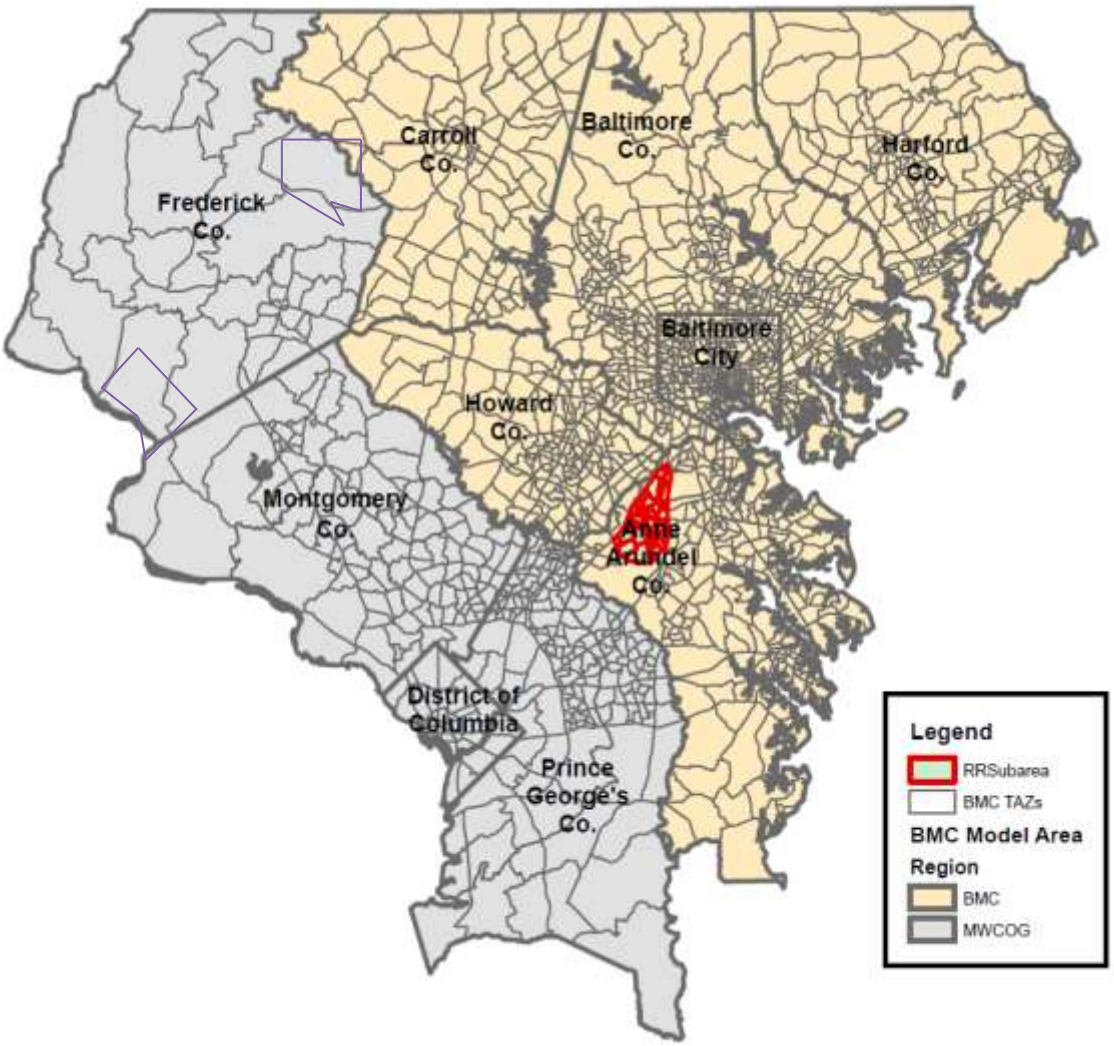


Figure 2: Ridge Road Study Area Location in Baltimore Regional Travel Demand Model Network

1.2 Subarea Analysis Process

The BMC Travel Model 4.4 TAZs and network detail were created in order to forecast travel on and analyze the regionally significant travel patterns and facilities within the adopted Travel Improvement Programs and Long Range Transportation Plan. Smaller TAZs and more network detail are needed to capture the impacts of new developments and specific traffic patterns/flows for project development within a specific corridor/subarea. This additional detail can be incorporated into the regional model land use data and highway/transit networks and new forecasts carried out using the full model process with mode choice and feedback loops, or when a subarea with no regionally significant new facilities or developments is being analyzed a subarea analysis/assignment process may be warranted. When there When no regionally significant developments or facilities are part of the study simply adding more detail on local and minor arterials within a subarea should not create significant shifts in the regional travel patterns (trip generation, trip distribution, mode split, and assignment in areas outside the study) or assignments in parts of the region far from the area in question. When an initial test was carried out for this study it seemed that the full BMC model was forecasting changes in trips and volumes from/to

areas not close to the Ridge Road Study area (e.g. Frederick County to Baltimore and volumes along I-70 and I-270). Consequently, a subarea analysis process was used for the Ridge Road North and South Corridors, which includes:

- Additional TAZ and network detail within the study subarea
- Post mode choice disaggregation of vehicle trips to the new TAZs
- Post mode choice traffic assignment using the subarea detailed network

This insures that the underlying regional trip generation, trip distribution, and mode split for the sub area study is the same as that found in the BMC regional model forecasts. The forecasts from the post mode choice traffic assignment are then used to develop the turning movements and other inputs to the SYNCHRO operational simulations using post-processing methods from the NCHRP Report 765: Analytical Travel Forecasting Approaches for Project-Level Planning and Design (NCHRP, 2015).

This sub area analysis process is shown in Figure 3. In this diagram the left side shows the BMC 4.4 networks are unchanged. The land use for BMC TAZs was updated to include the growth projections for the study area. The full model was run using the BMC TAZs and network, producing post mode choice trip tables at the BMC TAZ level. The right side of the diagram shows the sub area model, which used the split TAZs for the ridge road study area. Additional network detail was also added to capture local traffic options and connect the new TAZs to the network (centroid connectors). The updated BMC land use data was split between the study area TAZs. The BMC post mode choice trip tables were split using variables that represent the productions and attractions in each new zone (using the variables ROWPCT and COLPCT). The productions split was based on the percentage of households in each subzone and the attractions were based on the percentage of total employment. The sub area traffic assignment uses the network detail, land use attributes, and trip tables from the split TAZs, resulting in an output of average weekday volumes by direction.

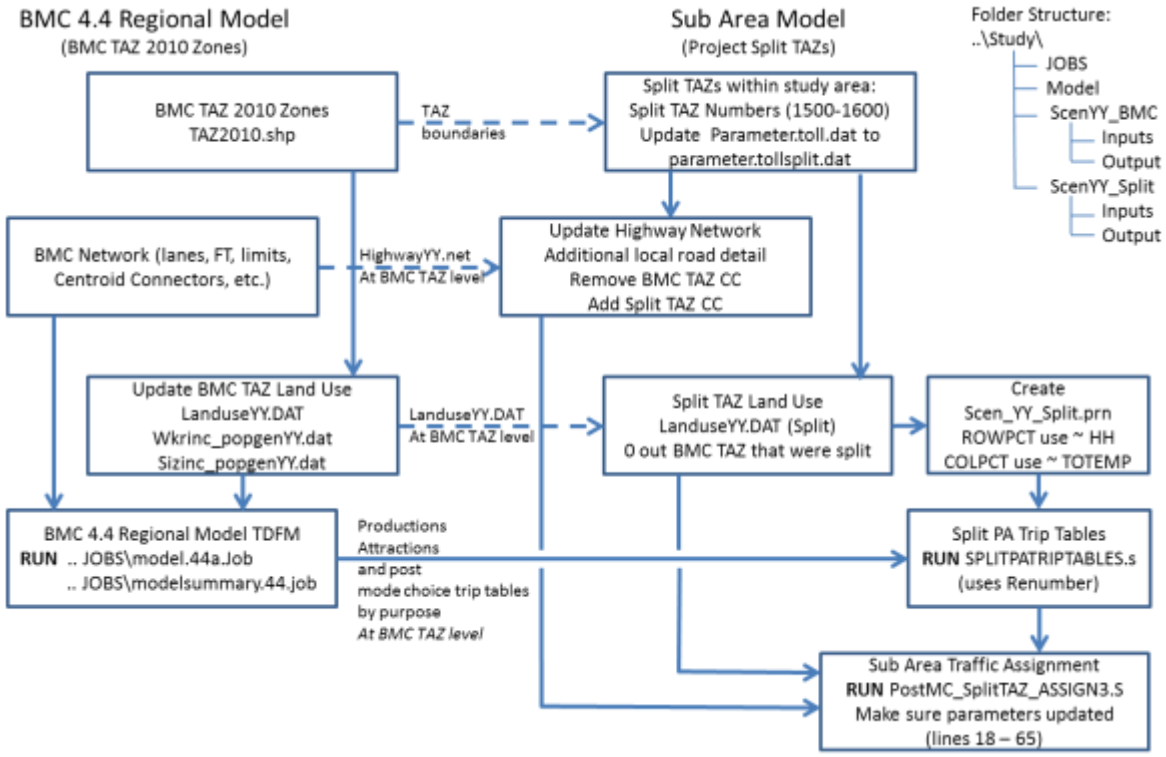


Figure 3 Ridge Road Sub Area Travel Forecasting Process

The details of the changes made and the results are further described in the remainder of this memorandum.

2 Base Year (2016/2017) Model Subarea and Validation

For this study the BMC 4.4 regional model was used as a baseline, with subarea focusing used to represent the study area along Ridge Road. The model study area extends along MD-32 (Patuxent Freeway) in the south from MD-295 (Baltimore-Washington Parkway) to the Amtrak rail line. The Eastern border follows the Amtrak line to the MD-295 and I-95 interchange and the western border runs along MD-295. This encompasses the Arundel Mills Mall, Fort Meade, as well as bordering Baltimore/Washington International airport. This area is shown in Figure 5 .

The Ridge Road 2017 Subarea Validation Process is shown in Figure 4. First, the 2017 BMC 4.4 model (using BMC TAZs) was run in order to provide the baseline productions and attractions along with the post mode choice trip tables by purpose. For the subarea model the BMC TAZs were then split in order to create the required additional detail. As seen in Figure 5 twenty three new zones were created from eight BMC zones. BMC centroids were replaced with new centroids for each subarea zone. The centroid connectors were placed so that the same nodes were connected as before, with additional nodes added by splitting links where it better represented the actual road network.

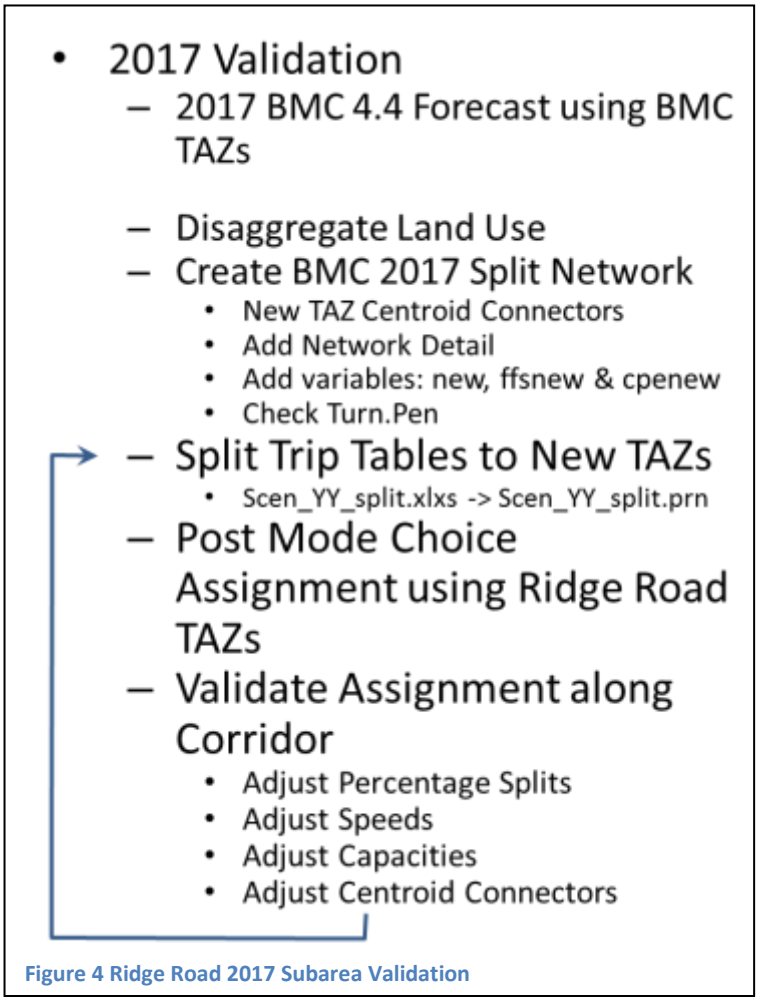


Figure 4 Ridge Road 2017 Subarea Validation

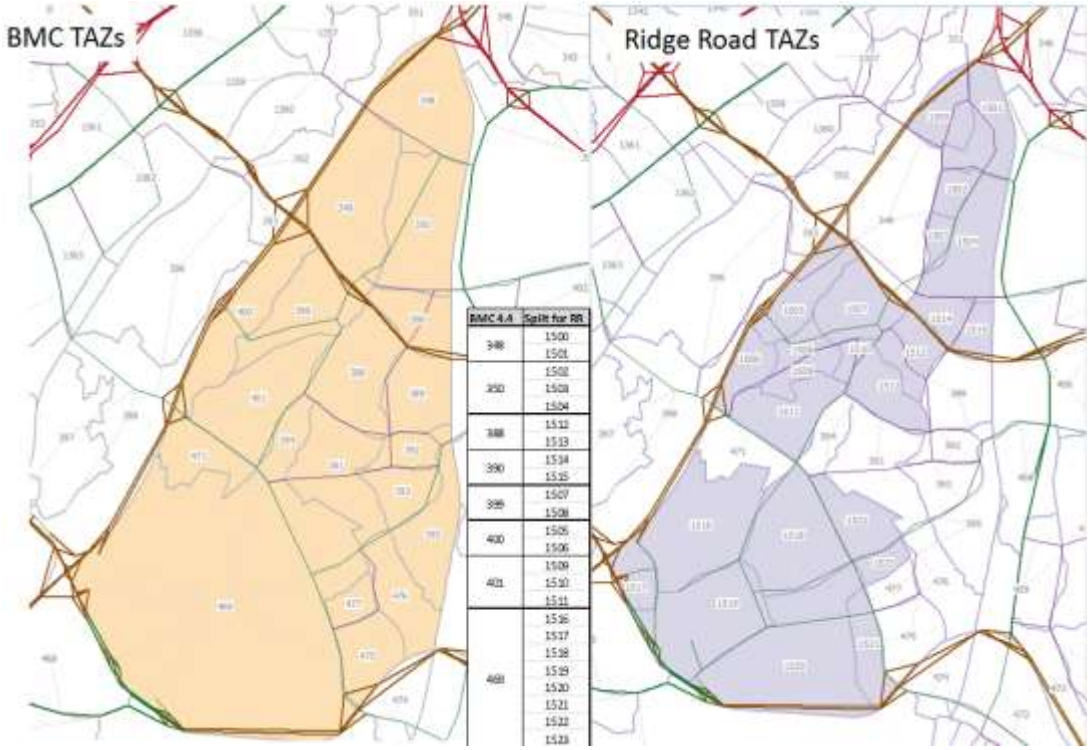


Figure 5 Ridge Road Study Area TAZ Splits

The TAZs from the BMC model were split into smaller zones for improved resolution of the study area. The Ridge Road subarea TAZ borders were based on the Howard County BRT study zones and the Anne Arundel County SAM II model zones as well as the boundaries of existing and proposed developments in the area. The new zones did not extend beyond the border of the original BMC zone, so that the BMC land use data could be split amongst them as seen in Table 1 Disaggregation of BMC Land Use to Subarea Zones. Land use data from the Howard County and SAM II models was compared to determine the ratio of the BMC TAZs' households, population, and employment to distribute to each new zone. Where the boundaries of the Howard County and Sam II models and the new zones did not overlap, parcel data and Google Earth observations were used to estimate the ratio of businesses and households in each zone. This land use data was then used to split the post mode choice trips from the BMC model run coming to and from the study area.

Network detail was then added to better capture local travel paths to/from the developments and split zones within the study area. Where local streets served primarily to provide access/egress to the new TAZs, they were represented by centroid connectors (e.g. TAZ 1505 and Dorchester Rd). The network detail added to the model includes:

- (Old) Ridge Road – MD-100 to Furnace Ave
- Dorsey Road – West of Ridge Road to Harmans Rd
- Wright Road – MD-100 to Race Rd
- Race Road – MD-175 to MD-100 and Hanover Rd to Furnace Rd
- Clark Road – MD-175 to Ridge Rd
- Ridge Chapel – Ridge Rd to Harmans Rd
- Coca Cola Drive – MD -100 to Hanover Rd
- Loudon Avenue – US-1 to Hanover Rd.
- River Road

- Fort Meade Internal Roads and Gates

New links were assigned attributes that correspond to the zone they are in.

Table 1 Disaggregation of BMC Land Use to Subarea Zones

BMC TAZ	RR TAZ	HH	Pop.	Tot. Empl
348	1500	75	175	235
348	1501	6	14	1218
350	1502	7	17	989
350	1503	5	14	460
350	1504	5	14	3664
400	1505	155	343	219
400	1506	1037	2303	65
399	1507	1	3	7368
399	1508	219	720	0
401	1509	292	563	0
401	1510	240	462	0
401	1511	296	572	50
388	1512	356	1016	72
388	1513	589	1677	115
401	1514	468	1504	191
409	1515	43	122	484
469	1516	1116	3869	0
469	1517	0	0	8504
469	1518	874	3359	4075
469	1519	0	0	16570
469	1520	364	2443	14168
469	1521	0	0	9828
469	1522	0	0	3916
469	1523	0	0	3370

A post mode choice traffic assignment using the new ridge road TAZs, network, and split trips to and from the study area was then carried out. Further improvements were made to the study area to better represent the observed traffic flow. SWA found that simply using the regional model look up tables for free flow speed based upon area type and functional class, and for capacity based upon area type and road type tended to overestimate the free flow speeds in the area (40 plus miles per hour on all local roads). Therefore, a variable to override the free flow speed calculated by the model (normally based on functional type) was assigned to new links in the corridor as well as others where the assigned volume was too high. The new variable accounts for the increased friction of the rural, two lane roads in the study area that was previously causing over assignment. In addition, turn penalties were used to control flow into Fort Meade, creating gates that eliminate pass through trips. Turn penalties were also used in the north section to account for perceived barriers in crossing MD 295 and correct the assigned volumes as compared to counts. These improvements are seen in Figure 6 Ridge Road 2017 Network Detail below.

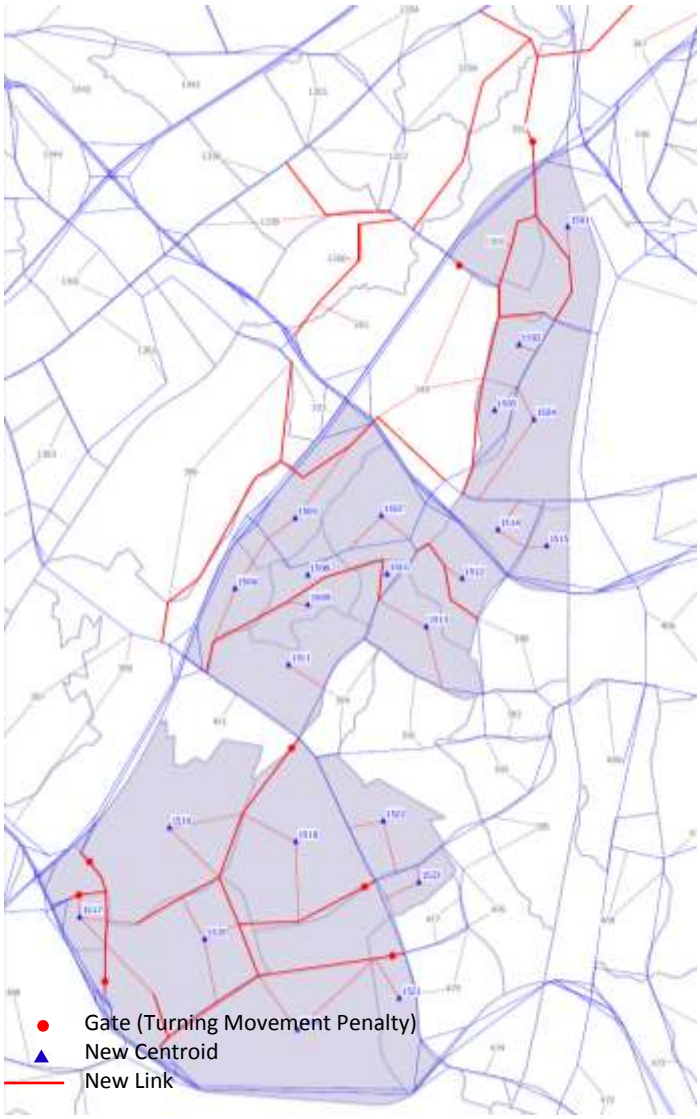


Figure 6 Ridge Road 2017 Network Detail

In order to validate the subarea network improvements and TAZ changes, the assigned volumes from the 2017 base year subarea model were compared to a variety of count data. The BMC 2017 model contained 2010 average weekday daily trips from SHA count stations. The 2010 AWDT were increased to 2017 values using a growth rate of 0.5%. Where 2010 data was not available, recent counts were taken from SHA's I-TMS and grown at 0.5% to 2017. The comparison with the AWDT, the BMC 2017, and the Ridge Road 2017 is shown in Table 3. The increased network detail in the subarea model is evident by the assigned volumes more closely matching the 2017 AWDT, particularly at Hanover Road and the northernmost sections of Ridge Road. Similarly, the MD-175 segment was more accurately represented, especially along southern Ridge Road.

To insure that the regional model was not significantly affected by changes in the subarea, the volume assignment along screenlines was compared for each model. The regional screenlines surrounding the study area and the differences in volumes are shown in Table 2 . Screenline 42, which cuts along the east side of I-97 from I-695 to MD-32, is reduced just over 1 %. All other screenlines are changed by less than 1 %. The validated volumes along with count data are depicted in Figure 7 Ridge Road Study 2017 Model assignment and counts. Overall, this indicates that the changes made in the subarea model did

not cause commuters' paths to change on the regional scale; which is appropriate because of the class of Ridge Road.

Table 2 Regional Screenline Checks

Screenline #	Name	24 Hour Volumes		% Diff
		BMC	SubArea	
14	Beltway Screenline (South)	390672	391128	0.1%
15	Beltway Screenline (Southwest)	565448	567064	0.3%
19	South Cordon Line	295459	295879	0.1%
20	Southwest Cordon (MD 32) Line	711259	712506	0.2%
42	West of MD3/I-97 Anne Arundel County	290263	286471	-1.3%
43	Howard/Anne Arundel County Line	450397	454503	0.9%

Table 3 Selected Segment Validation

				Percent Difference	
Segments	2017 AWDT	BMC 2017	Ridge Road 2017	BMC - AWDT	Ridge Rd - AWDT
Ridge Road at MD 295	2545	103	2771	-96%	9%
Hanover Rd - West of MD 295	2125	13713	2579	545%	21%
New Ridge Road North of Dorsey	13585	22000	14182	62%	4%
New Ridge Road North of MD 100	40125	44728	40368	11%	1%
Ridge Road North of MD 175	18000	20857	20290	16%	13%
MD 175 East of MD 295	32575	32817	32681	1%	0%
MD 175 East of Disney Road	24375	11652	24859	-52%	2%
Disney Road N of MD 175	7600	10407	8159	37%	7%

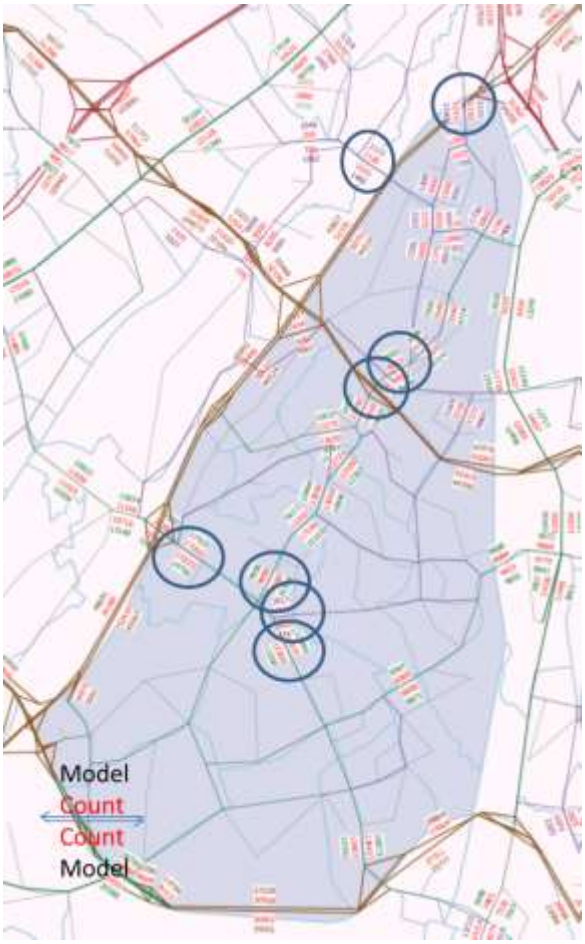


Figure 7 Ridge Road Study 2017 Model assignment and counts

3 Future Year (2040) Land Use and Networks

3.1 2017 to 2040 Land Use

Land use forecasts for the BMC 4.4 model were updated to create the sub area land use matrix. The future year subarea land use changes were the result of comparing the growth accounted for in the BMC 4.4 2040 model and the change in households and employment expected from proposed developments. All proposed developments were assumed to be completed by 2040. The differences in households, population, and employment between the two models, account for cases where not all of the development growth was accounted for in BMC 4.4 Round 8a Land Use (Table 4 Land Use Changes between BMC and Ridge Road Models for 2040).

Table 4 Land Use Changes between BMC and Ridge Road Models for 2040

		BMC 2017			BMC 2040			Ridge Road Development			Change from BMC		
BMCTAZ	RRTAZ	HH	POP	EMPL	HH	POP	EMPL	HH	POP	EMPL	HH	POP	EMPL
389	389	917	2578	69	1057	2764	72	1057	2764	72	0	0	0
391	391	996	2817	142	1184	3018	144	1327	3383	144	143	365	0
392	392	749	2149	14	770	2302	14	770	2302	14	0	0	0
393	393	1172	3335	143	1322	3575	148	1322	3575	148	0	0	0
394	394	640	1905	241	642	2042	248	642	2042	248	0	0	0
395	395	1243	3670	17	1463	3932	17	1463	3932	17	0	0	0
471	471	459	1163	367	1935	4567	1011	1998	4716	1011	63	149	0
475	475	2063	4815	560	2424	5160	759	2424	5160	759	0	0	0
476	476	1313	4076	143	1561	4368	193	1561	4368	193	0	0	0
477	477	565	1666	150	565	1786	204	565	1786	204	0	0	0
348	1500	75	175	235	42	100	91	252	577	850	210	477	759
348	1501	6	14	1218	39	90	1362	39	90	2204	0	0	842
350	1502	7	17	989	6	18	773	6	18	773	0	0	0
350	1503	5	14	460	3	7	1236	3	7	1236	0	0	0
350	1504	5	14	3664	8	23	4944	8	23	4944	0	0	0
400	1505	155	343	219	1235	2467	259	1330	2658	926	95	191	667
400	1506	1037	2303	65	184	368	159	282	563	818	98	195	659
399	1507	1	3	7368	22	78	10960	22	78	10960	0	0	0
399	1508	219	720	0	198	698	1218	198	698	1218	0	0	0
401	1509	292	563	0	345	387	21	345	387	22	0	0	1
401	1510	240	462	0	387	424	17	387	424	18	0	0	1
401	1511	296	572	50	792	901	22	1181	1327	1217	389	426	1195
388	1512	356	1016	72	414	1087	74	414	1087	74	0	0	0
388	1513	589	1677	115	685	1798	122	685	1798	122	0	0	0
401	1514	468	1504	191	504	1594	349	504	1594	349	0	0	0
409	1515	43	122	484	47	148	744	47	148	744	0	0	0
469	1516	1116	3869	0	1116	3869	0	1116	3869	0	0	0	0
469	1517	0	0	8504	0	0	8504	0	0	8504	0	0	0
469	1518	874	3359	4075	874	3359	4075	874	3359	4075	0	0	0
469	1519	0	0	16570	0	0	16570	0	0	16570	0	0	0
469	1520	364	2443	14168	364	2443	14168	364	2443	14168	0	0	0
469	1521	0	0	9828	0	0	9828	0	0	9828	0	0	0
469	1522	0	0	3916	0	0	3916	0	0	3916	0	0	0
469	1523	0	0	3370	0	0	3370	0	0	3370	0	0	0

Developments planned in the study area consist of commercial, retail, and housing, many in mixed use complexes, seen in Figure 8 Developments in the Ridge Road Study Area, with the number of jobs and dwelling units in each listed in

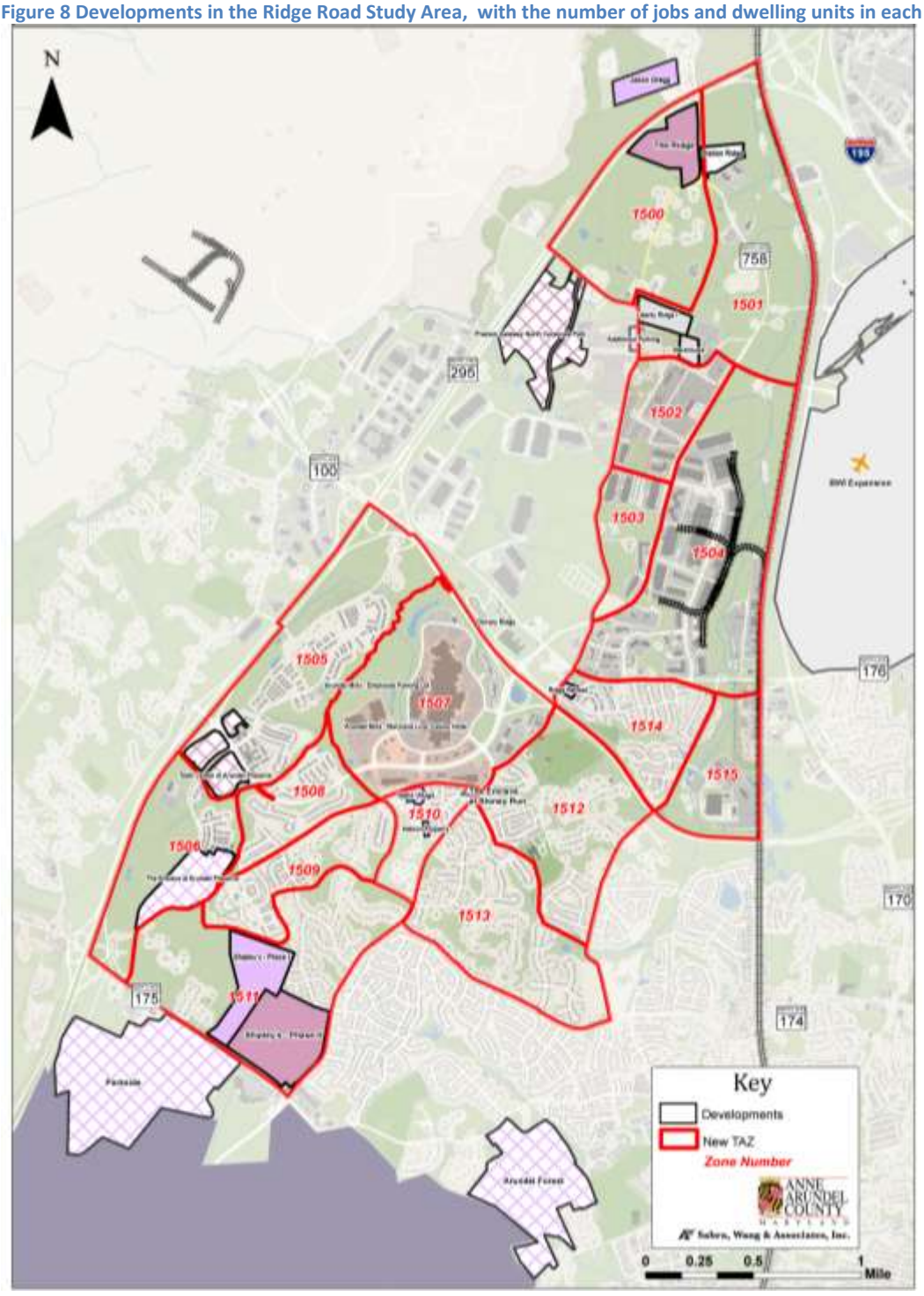


Figure 8 Developments in the Ridge Road Study Area

Table 5. Along the Northern section of Ridge Road there are 4 new developments, a townhouse with a hotel and office buildings, two industrially zoned buildings, and a single family residential area. In total there will be 3500 jobs, and 216 dwelling units. In the southern part of the study area, between MD 100

and MD 175, 1800 jobs and 2800 dwelling units will be created across 10 proposed developments. Developments in zones that were not split were also accounted for.

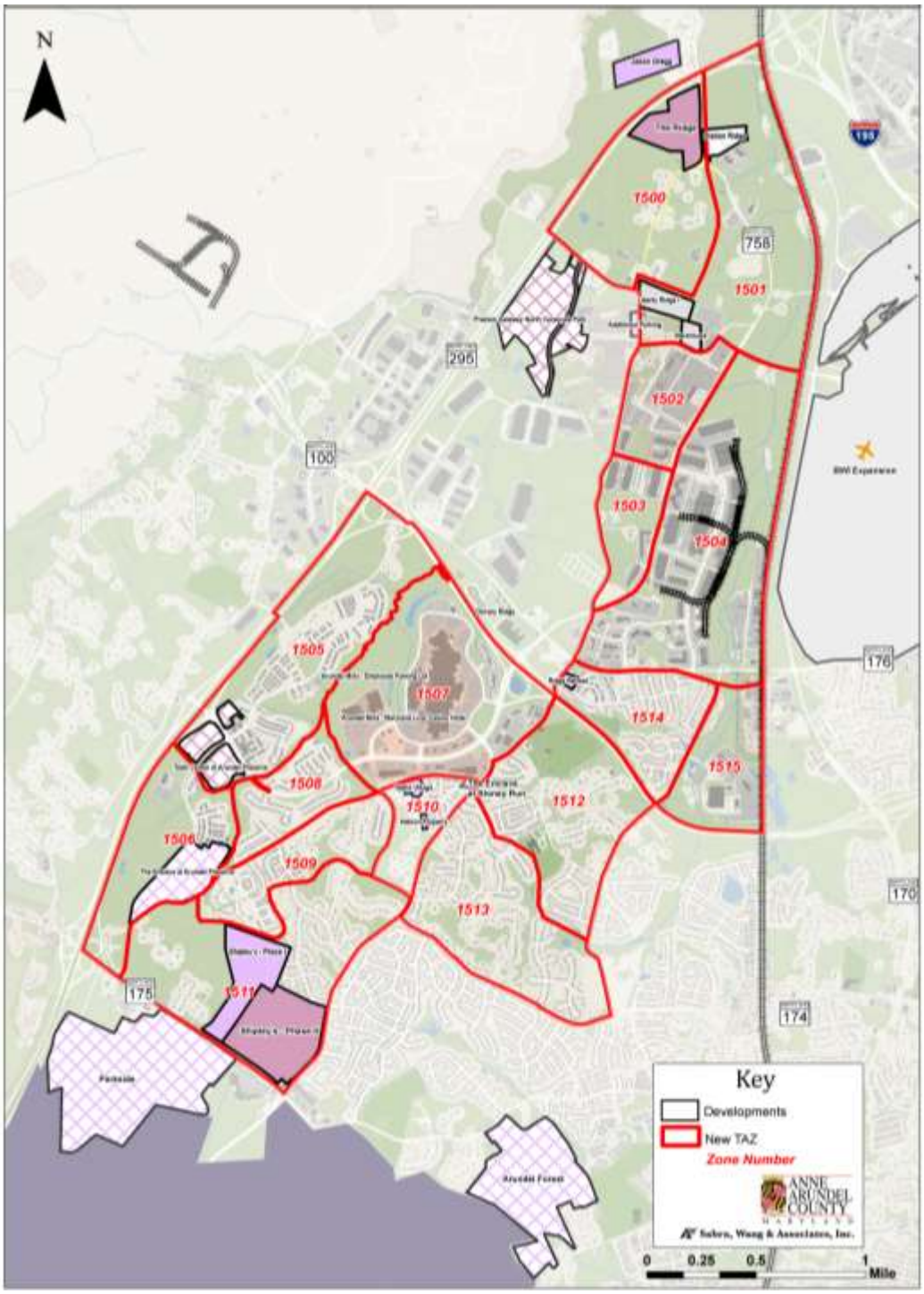


Figure 8 Developments in the Ridge Road Study Area

Table 5 Developments included in transportation demand forecasting

Project Name	Project Type	Jobs	D.U.	TAZ #
Liberty Ridge I	Industrial	660	0	348 / 1501
The Ridge	Mixed-Use	671	210	348 / 1500
Preston Gateway North Corporate Park	Industrial	2226	0	349
Ridge Retreat	Residential	0	6	390 / 1514
Arundel Forest	Residential	0	291	391
Arundel Mills - Employee Parking Lot	Commercial	0	0	399 / 1507
Arundel Mills - Maryland Live! Casino Hotel	Commercial	60	0	399 / 1507
Town Center at Arundel Preserve	Mixed-Use	585	242	400 / 1505
The Enclave at Arundel Preserve	Residential	0	127	400 / 1506
The Commons at Shipley's Homestead	Mixed-Use	1194	831	401 / 1511
Watts Village	Residential	0	52	401 / 1510
Hebron Property	Residential	0	26	401 / 1510
The Enclave at Stoney Run	Residential	0	26	401 / 1510
Parkside	Residential	0	1219	471

A question was raised regarding the Shipley's Homestead development and the significant provides significant new growth it provided in TAZ 1511. When SWA originally analyzed the planned developments and incorporated them into the 2040 TAZ land use forecasts the site plan for the Shipley's Homestead development was not available. Thus, only access onto MD 713 (Ridge Road) was assumed. We now have the site development plans that show 2 access points along MD 713 and 3 planned access points along MD 175. Based upon the site plans and the BMC growth for the zone we can assume that all of the growth in TAZ 1511 is due to the Shipley's Homestead. The forecast volumes for TAZ 1511 grow from 2073 in/out in 2017 to 14367 in/out in 2040. This amounts to approximately 12,300 vehicle trips added to the network. When we analyzed the roads used based on where the vehicle trips for TAZ 1511 are coming from and going to (using select link analyses) we found that 25% of the trips utilized MD 713 from the North to reach/leave TAZ 1511, 56% utilized MD 175 from the West, 15% utilized MD 175 from the East, and 4 % came from the Fort Meade TAZs to the South. This would lower the daily trips entering/exiting TAZ 1511 from MD 173 by ~ 8,000 (assuming ½ of the trips from the south and east would still use Ridge Road), or 800 trips in the Peak Hours. These adjustments will be

made in the traffic/turning movement analysis. The number of trips going to and from zone 1511 in the year 2040 was determined for the north, west, east, and Fort Meade approaches, seen in Table 6.

Table 6 2040 Approach Volumes to/from TAZ 1511

Approach	Approach Volume	Percent of Total
North (MD 713)	3661	25%
West (MD 175)	8007	56%
East (MD 175)	2180	15%
South (Fort Meade)	521	4%

3.2 2017 to 2040 Networks

The BMC 4.4 2040 model included expected improvements to the study area, highlighted in Figure 9 2017 to 2040 Subarea Model Improvements. Most notable is the addition of the MD 295 and Hanover Road Interchange. By 2040 there will be an increase in capacity along MD-175, MD-100 and MD-295. The southern portion of Ridge Road gains a lane in each direction. An interchange at MD-295 and Hanover Road is planned. Hanover Rd will also be connected to Stony Run Road and the functional type will be improved. The functional type of Dorsey Run Road will improve, and US-1 will have lanes added.

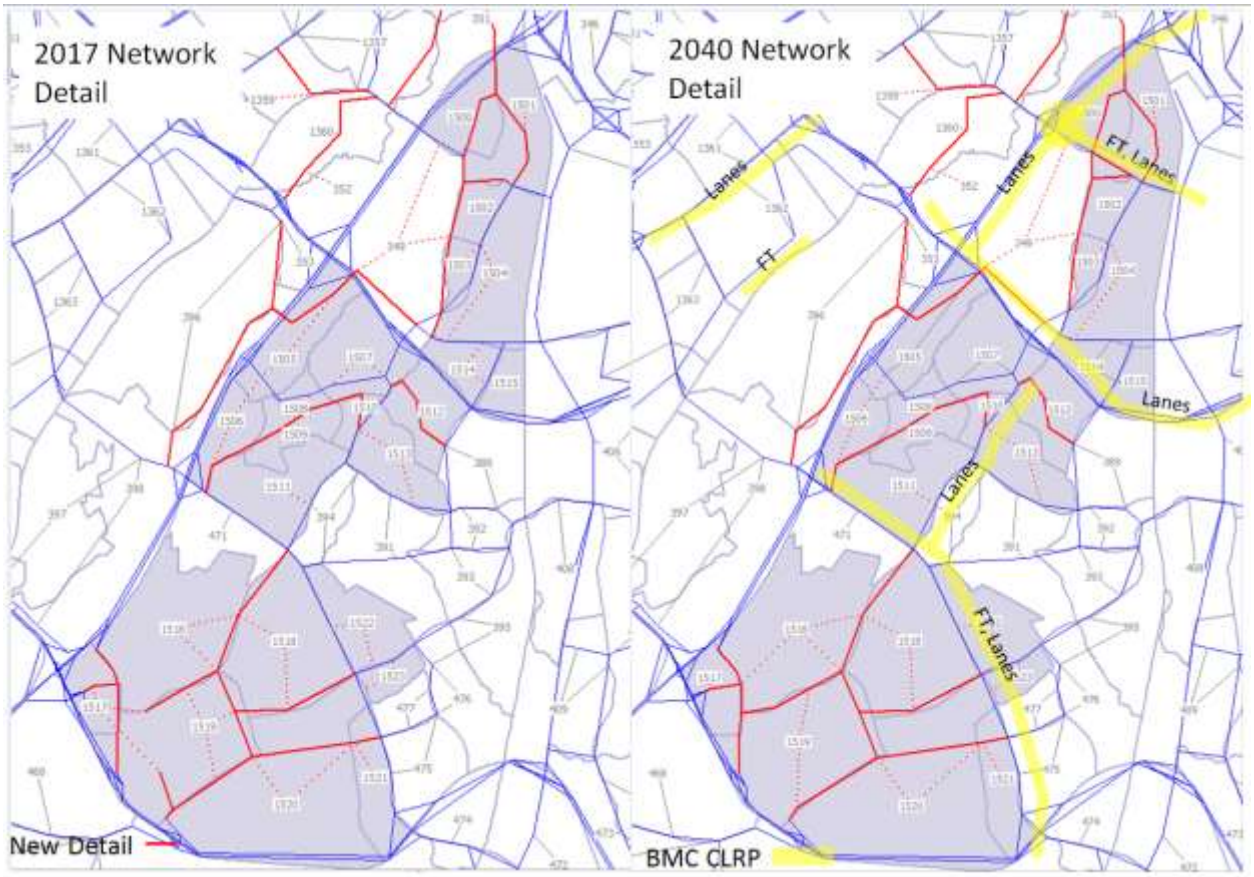


Figure 9 2017 to 2040 Subarea Model Improvements

4 Future Year Forecasts and Growth

Future year volumes were forecasted with the proposed network changes in place. Figure 6 compares the 2017 and 2040 subarea model volumes. Table 4 shows the annual and total growth percentages for the Ridge Road corridor. The growth rates for each segment were input into NCHRP 765 post processing to create future year turning movement counts.

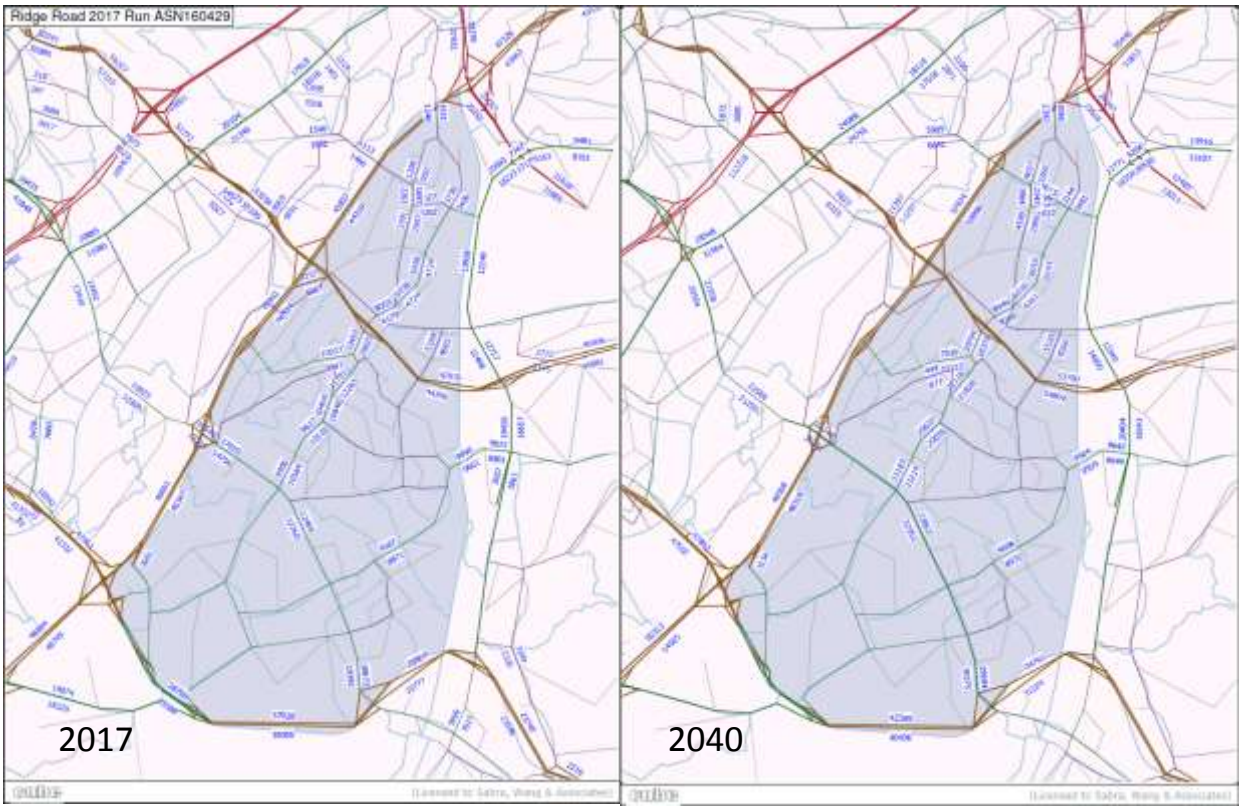


Figure 10 Subarea Model, 2017 and Forecasted 2040 Average Weekday Traffic Volumes

Table 7 Forecast Average Weekday Traffic Growth

Roadway	Segment From	Segment To	Base Year	Forecast 2040	% Annual Increase	% Increase 2017-2040
Ridge Rd	MD 175	Metacomet Rd	20,300	34,400	3.0%	69%
	Severn Rd	Watts Ave	21,300	41,100	4.0%	93%
	New Ridge Rd	Stoney Run Rd	6,400	7,600	0.8%	19%
	Stoney Run Rd	Hanover Rd	4,000	6,300	2.5%	58%
	Hanover Rd	Corporate Center Dr	6,400	7,600	0.8%	19%
	Corporate Center Dr	German Driveway	2,800	4,500	2.6%	61%
New Ridge Rd	Dorsey Rd	Ridge Rd	14,200	17,200	0.9%	21%
	Ridge Rd	Charwood Rd	10,700	12,200	0.6%	14%
	Stoney Run Rd	Ridge Rd	4,100	5,600	1.6%	37%
Arundel Mills Blvd	Ridge Rd	MD 100 Ramps	62,100	78,200	1.1%	26%
Hanover Rd	Ridge Rd	Race Rd	2,600	33,000	50.8%	1169%
MD 175	Disney Rd	Reece Rd	25,900	66,800	6.9%	158%
				Adjusted for Shipley's Homestead		

A question was also raised regarding the growth on specific segments in the study area. Hanover road is increasing due to the new interchange. MD 175 is also increasing to the east, but this does not seem to

be across the whole western side of the study area. We suspect it is due to path diversions from Fort Meade. Along Ridge Road, especially just North of MD 175 there is also greater than 1% growth per year, but there is also significant development. A screenline comparison and check on future growth was therefore carried out. As shown in Figure 11 these check the North South volumes crossing the study area in the South (1a, 1), the Middle (3a, 3), and the North (2), and the East West Volumes from the East (4) and the West (5). The growth for each screenline is shown in Table 8. As shown the North South growth varies between 0.76% in the South to 1.44% in the North. This makes sense based on the new growth in the North part of the study area, where there is relatively little now. The East West growth (2.33%) is most significant just east of MD 295, primarily due to the new interchange at Hanover. The growth to the West is low at 0.78%.

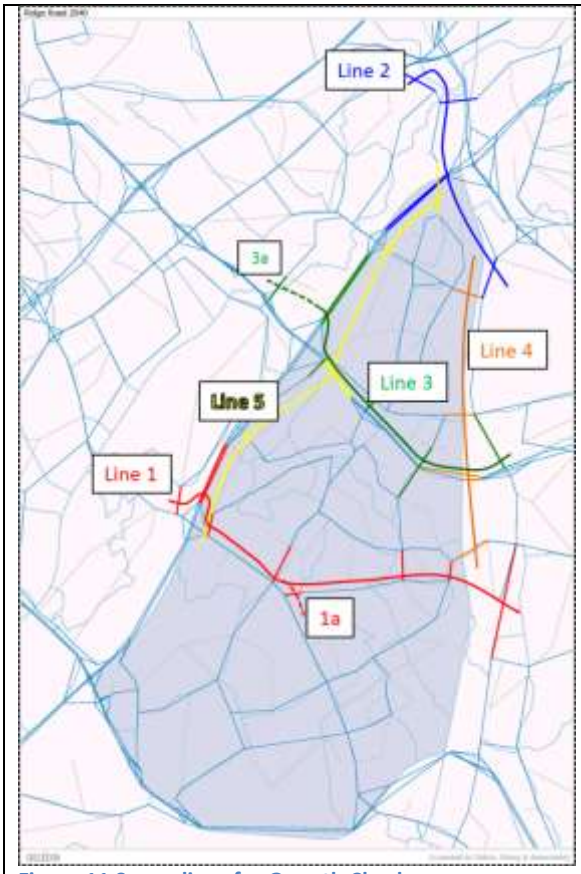


Figure 11 Screenlines for Growth Check

Table 8 Screenline Growth Check

	Screenline totals				Annual
	2017	2040	Difference	% Difference	% Growth
1	178,670	210,072	31,402	18%	0.76%
1a	126,436	151,192	24,756	20%	0.85%
2	137,906	183,559	45,653	33%	1.44%
3	188,007	229,771	41,764	22%	0.97%
3a	168,457	207,137	38,680	23%	1.00%
4	157,348	185,720	28,372	18%	0.78%
5	170,401	261,754	91,353	54%	2.33%

Existing and Future Year AWDT for the network are shown in the following two figures.

Figure 12: Existing Year AWDT Plot

Figure 13: Future Year 2040 AWDT Plot

Appendix B:

Existing, 2040 No build, and Recommended Design CLV Spreadsheets

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at MD 175

Conditions: Existing

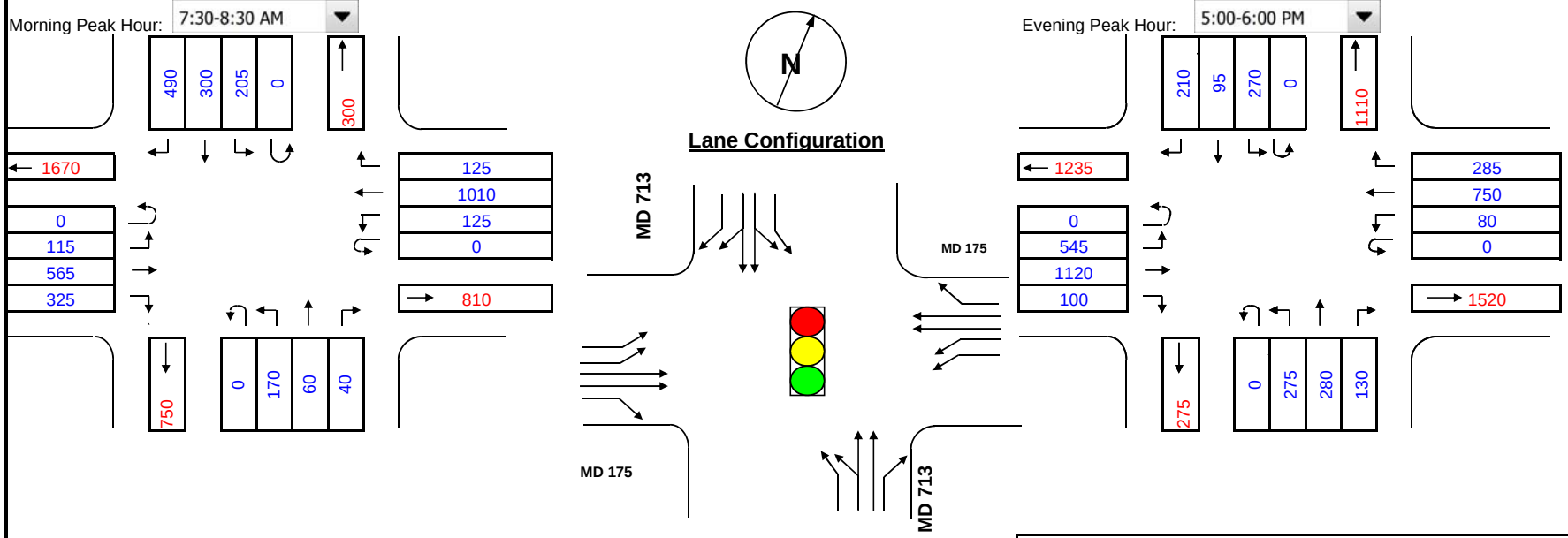
Design Year: 2015

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- (•) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	230	0.40	92	0	92	*		NB	555	0.40	222	0	222	*
	SB	995	0.30	299	0	299	*		SB	575	0.30	173	0	173	*
	EB	565	0.55	311	75	386			EB	1120	0.55	616	48	664	
	WB	1010	0.55	556	69	625	*		WB	750	0.55	413	327	740	*
Remarks:			* Critical volume		Total	1015		Remarks:			* Critical volume		Total	1134	
					Level of service (V/C)	0.63	B						Level of service (V/C)	0.71	B

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at MD 175

Conditions: Existing

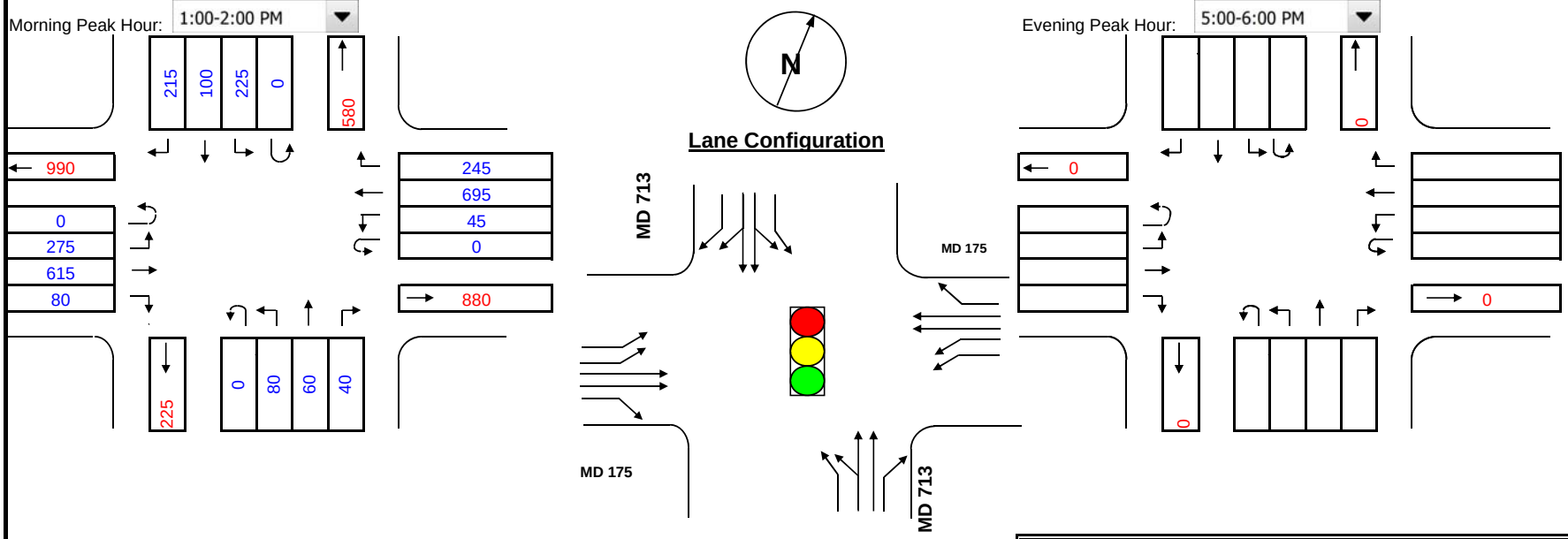
Design Year: 2015

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- (•) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	140	0.40	56	0	56	*		NB	0	0.40	0	0	0	*
	SB	540	0.30	162	0	162	*		SB	0	0.30	0	0	0	*
	EB	615	0.55	338	27	365			EB	0	0.55	0	0	0	
	WB	695	0.55	382	165	547	*		WB	0	0.55	0	0	0	
Remarks:			* Critical volume		Total	765		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.48	A						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at MD 175

Conditions: No Build

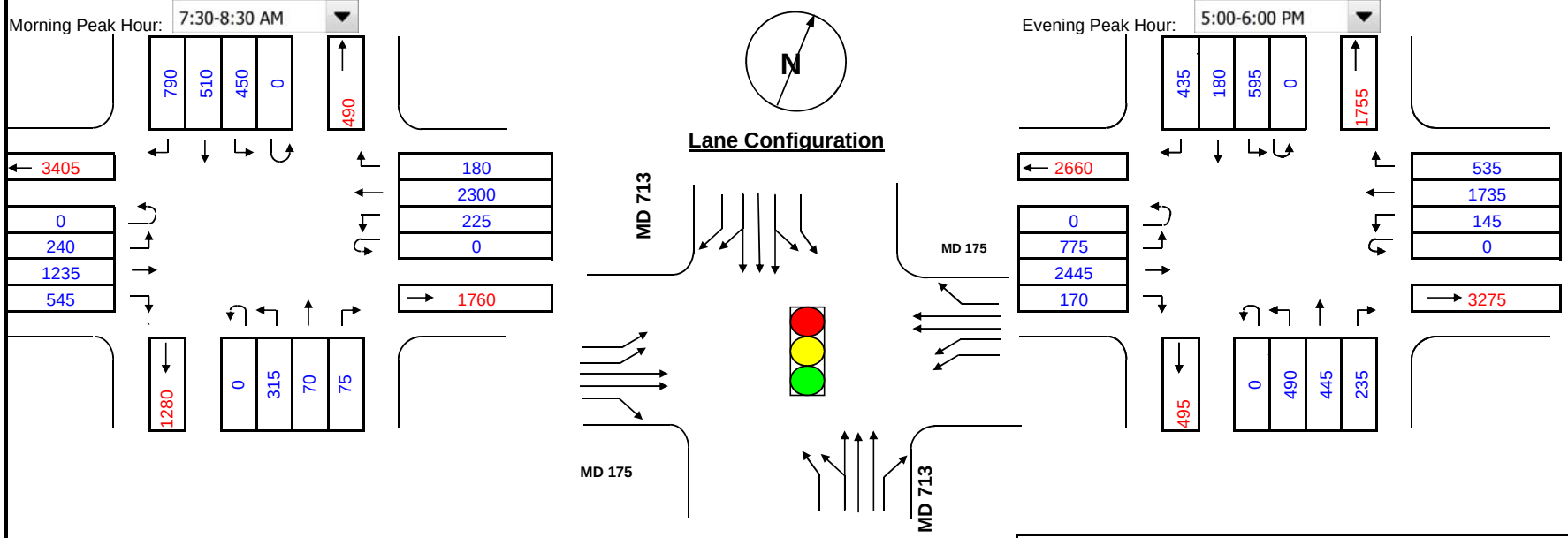
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- (•) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	385	0.30	116	0	116	*		NB	935	0.30	281	0	281	*
	SB	1606	0.25	402	0	402	*		SB	775	0.25	194	0	194	*
	EB	1235	0.55	679	135	814			EB	2445	0.55	1345	87	1432	*
	WB	2300	0.55	1265	144	1409	*		WB	1735	0.55	954	465	1419	
Remarks:			* Critical volume		Total	**1926**		Remarks:			* Critical volume		Total	**1906**	
					Level of service (V/C)	**1.20**	**F**						Level of service (V/C)	**1.19**	**F**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at MD 175

Conditions: No Build

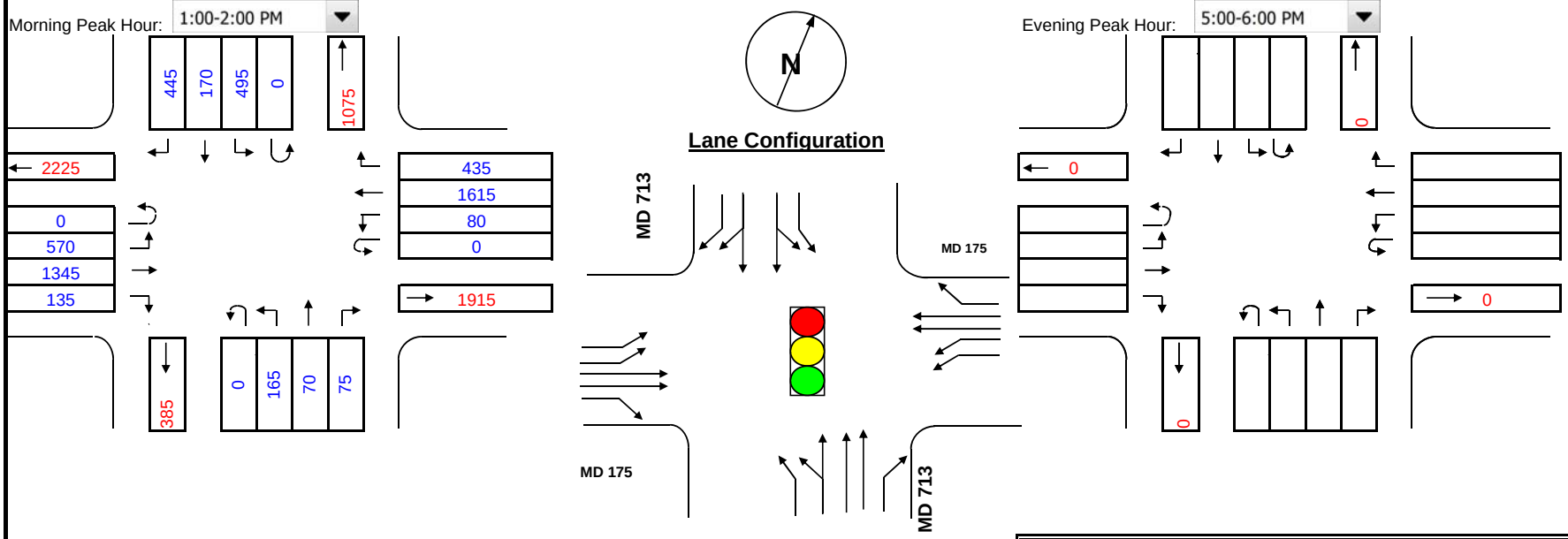
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- (•) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	235	0.30	71	0	71	*		NB	0	0.30	0	0	0	*
	SB	768	0.25	192	0	192	*		SB	0	0.25	0	0	0	*
	EB	1345	0.55	740	48	788			EB	0	0.55	0	0	0	
	WB	1615	0.55	888	342	1230	*		WB	0	0.55	0	0	0	
Remarks:			* Critical volume		Total	1493		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.93	E						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at MD 175

Conditions: Build

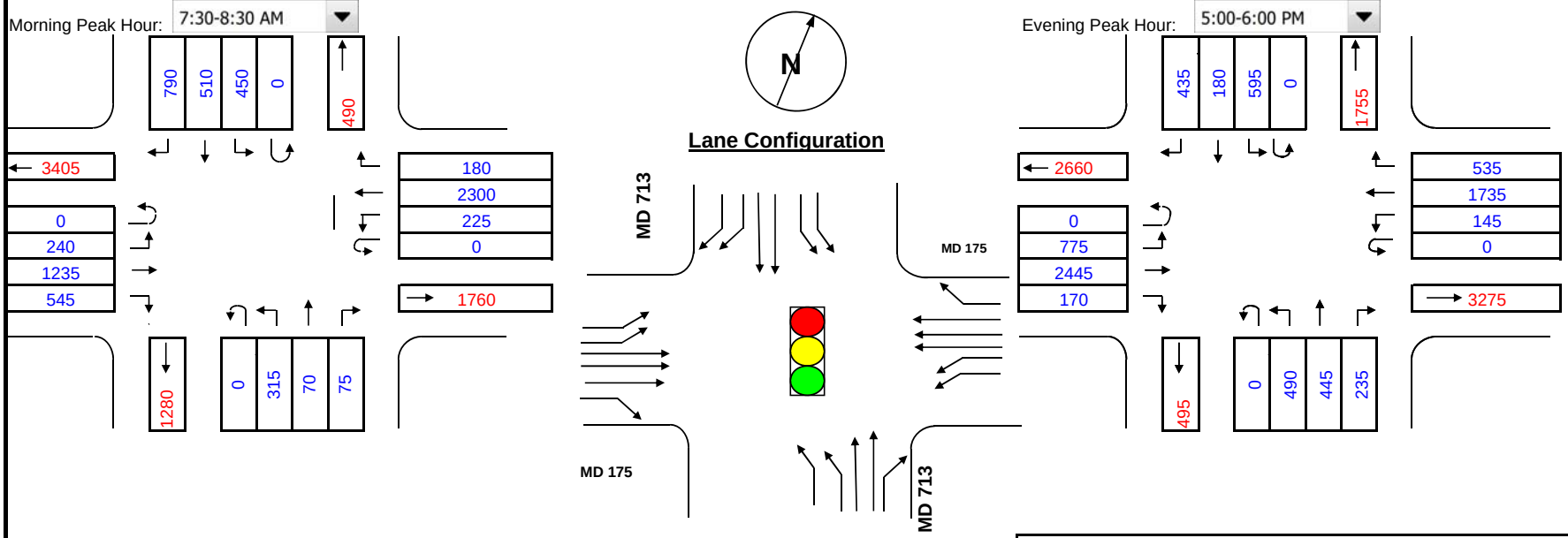
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	70	0.55	39	270	309			NB	445	0.55	245	594	839	*
	SB	646	0.55	355	189	544	*		SB	180	0.60	108	294	402	
	EB	1235	0.40	494	135	629			EB	2445	0.40	978	87	1065	
	WB	2300	0.40	920	144	1064	*		WB	1735	0.40	694	465	1159	*
Remarks:			* Critical volume		Total	1608		Remarks:			* Critical volume		Total	1998	
					Level of service (V/C)	1.01	F						Level of service (V/C)	1.25	F

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at MD 175

Conditions: No Build

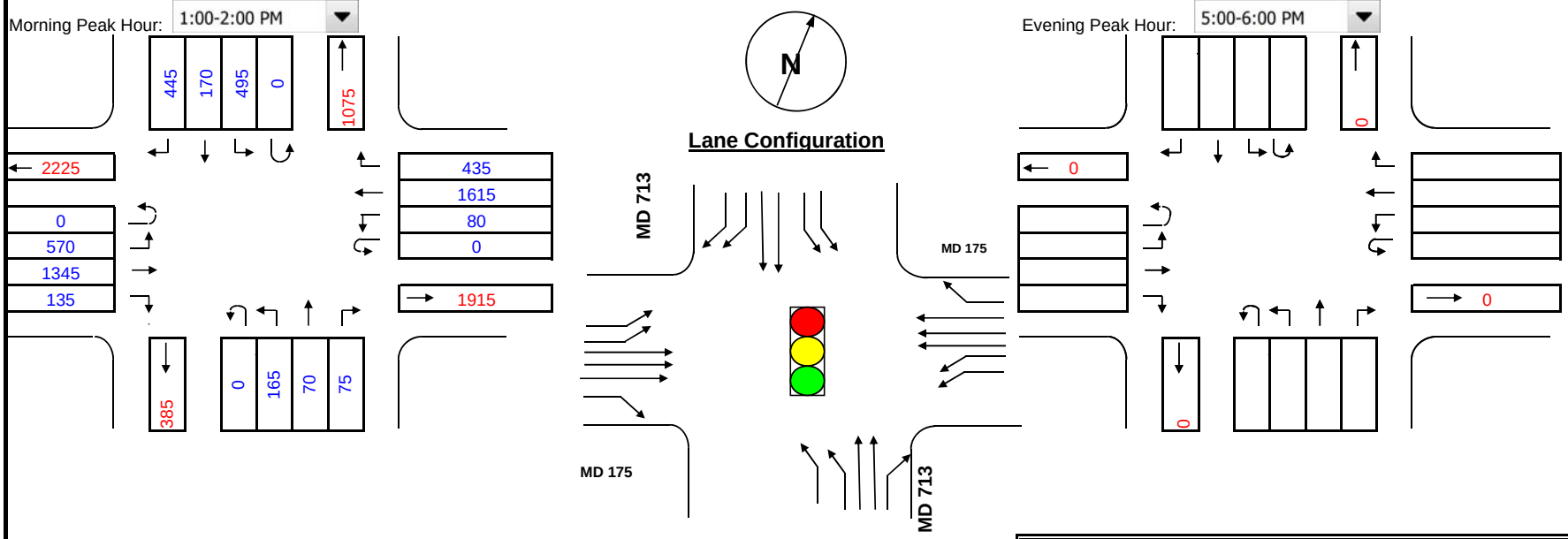
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	70	0.55	39	297	336	*		NB	0	0.55	0	0	0	
	SB	170	0.55	94	99	193			SB	0	0.55	0	0	0	
	EB	1345	0.40	538	48	586			EB	0	0.40	0	0	0	
	WB	1615	0.40	646	342	988	*		WB	0	0.40	0	0	0	
Remarks:			* Critical volume		Total	1324		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.83	D						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Stone Castle Dr/Metacomet Rd

Conditions: Existing

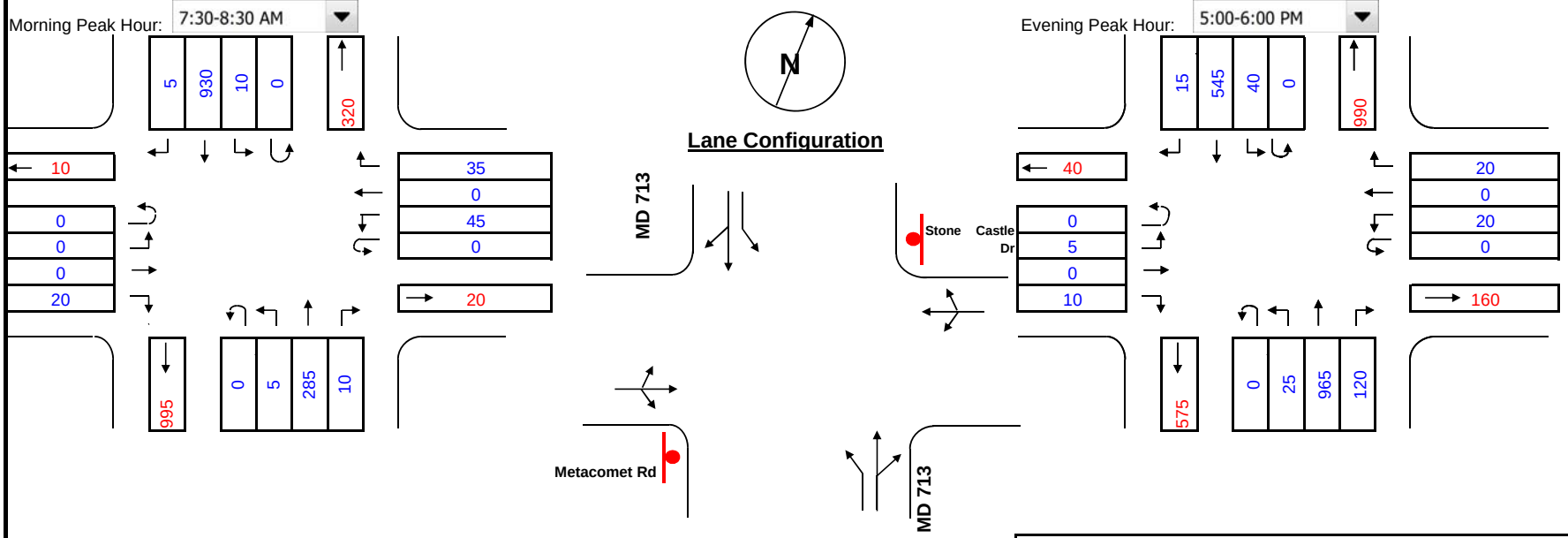
Design Year: 2015

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- ☐ Northbound
- ☐ Southbound
- ☑ Eastbound
- ☑ Westbound

Split Phasing
- ○ East/West
- ○ North/South
- ◉ None

Inx. Control
- ○ Signal
- ◉ Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	295	1.00	295	10	305			NB	1085	1.00	1085	40	1125	*
	SB	935	1.00	935	5	940	*		SB	560	1.00	560	25	585	
	EB	20	1.00	20	45	65			EB	16	1.00	16	20	36	
	WB	85	1.00	85	0	85	*		WB	42	1.00	42	5	47	*
Remarks:			* Critical volume		Total	**1025**		Remarks:			* Critical volume		Total	**1172**	
					Level of service (V/C)	**0.64**	**B**						Level of service (V/C)	**0.73**	**C**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Stone Castle Dr/Metacomet Rd

Conditions: Existing

Design Year: 2015

Computed by: JC

Date 7/26/2016

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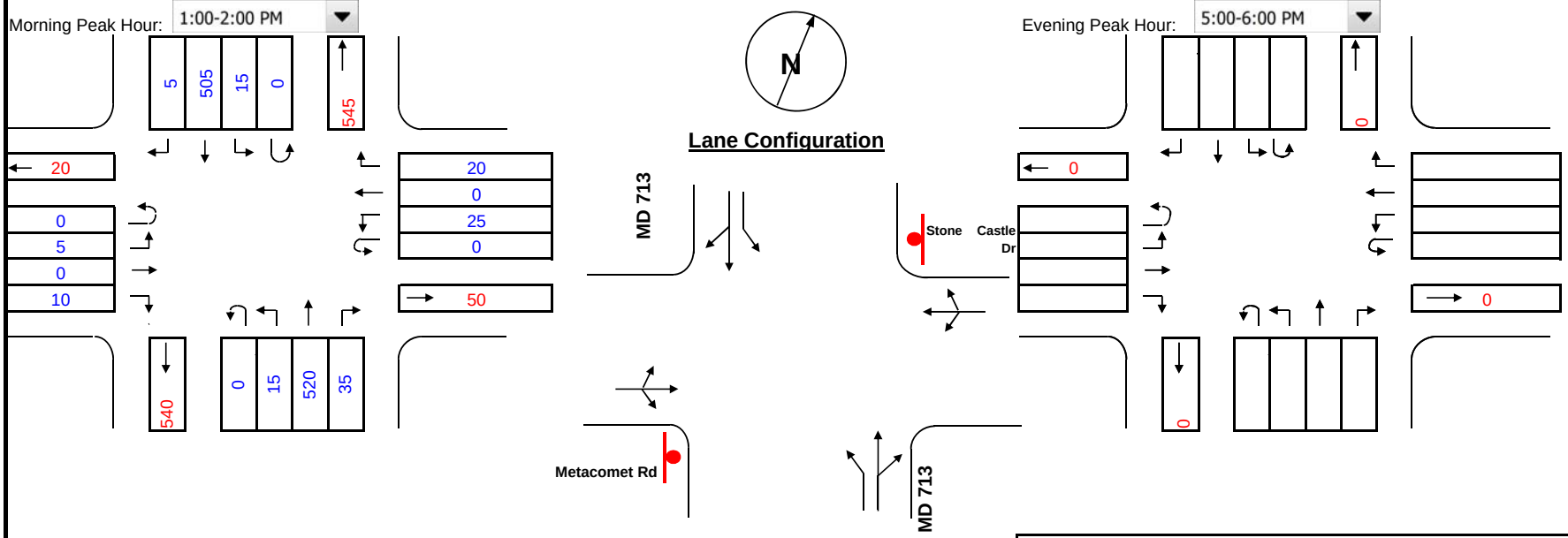


Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- ( ) Signal
- (•) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	555	1.00	555	15	570	*		NB	0	1.00	0	0	0	
	SB	510	1.00	510	15	525			SB	0	1.00	0	0	0	
	EB	16	1.00	16	25	41			EB	0	1.00	0	0	0	
	WB	48	1.00	48	5	53	*		WB	0	1.00	0	0	0	
Remarks:			* Critical volume		Total	623		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.39	A						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Stone Castle Dr/Metacomet Rd

Conditions: No Build

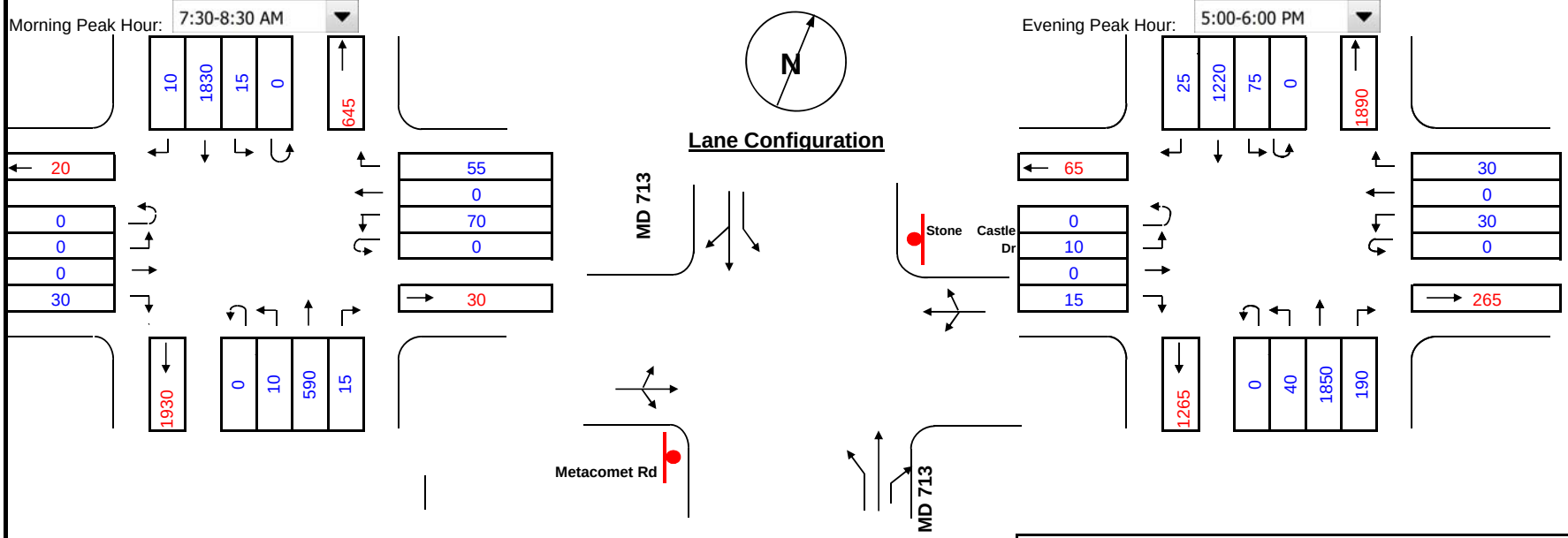
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap: ☑ Northbound ☑ Southbound ☑ Eastbound ☑ Westbound

Split Phasing: ○ East/West ○ North/South ◉ None

Inx. Control: ○ Signal ◉ Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	590	1.00	590	15	605			NB	1850	1.00	1850	75	1925	*
	SB	1840	1.00	1840	10	1850	*		SB	1245	1.00	1245	40	1285	
	EB	30	1.00	30	70	100			EB	26	1.00	26	30	56	
	WB	132	1.00	132	0	132	*		WB	63	1.00	63	10	73	*
Remarks:			* Critical volume		Total	1982		Remarks:			* Critical volume		Total	1998	
					Level of service (V/C)	1.24	F						Level of service (V/C)	1.25	F

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Stone Castle Dr/Metacomet Rd

Conditions: No Build

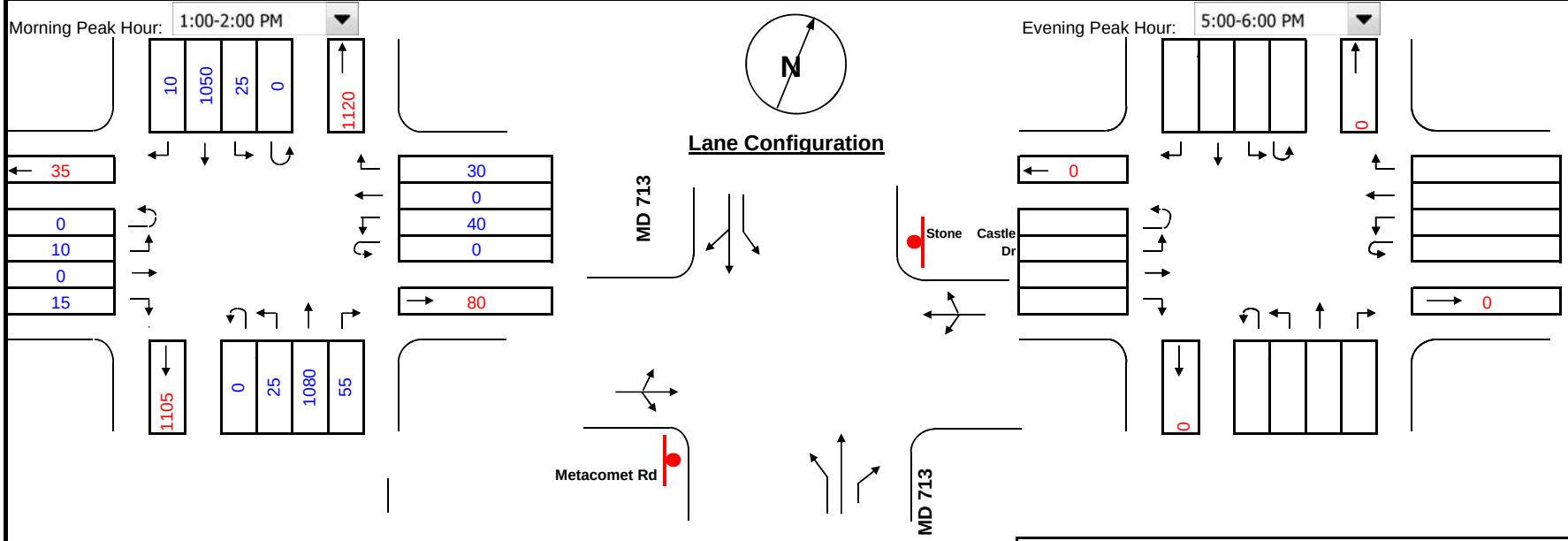
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1 =	1.00	A <=	1000	<= 199	1.1
2 =	0.55	B <=	1150	<= 599	2.0
3 =	0.40	C <=	1300	<= 799	3.0
4 =	0.30	D <=	1450	<= 999	4.0
5 =	0.25	E <=	1600	> 1000	5.0
Dbl-Lt =	0.60	F >	1600		

Phasing

RTOR/Overlap: ☐ Northbound ☐ Southbound ☐ Eastbound ☐ Westbound

Split Phasing: ○ East/West ○ North/South ◉ None

Inx. Control: ○ Signal ◉ Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	1080	1.00	1080	25	1105	*		NB	0	1.00	0	0	0	
	SB	1060	1.00	1060	25	1085			SB	0	1.00	0	0	0	
	EB	26	1.00	26	40	66			EB	0	1.00	0	0	0	
	WB	74	1.00	74	10	84	*		WB	0	1.00	0	0	0	
Remarks:			* Critical volume		Total	1189		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.74	C						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Stone Castle Dr/Metacomet Rd

Conditions: No Build

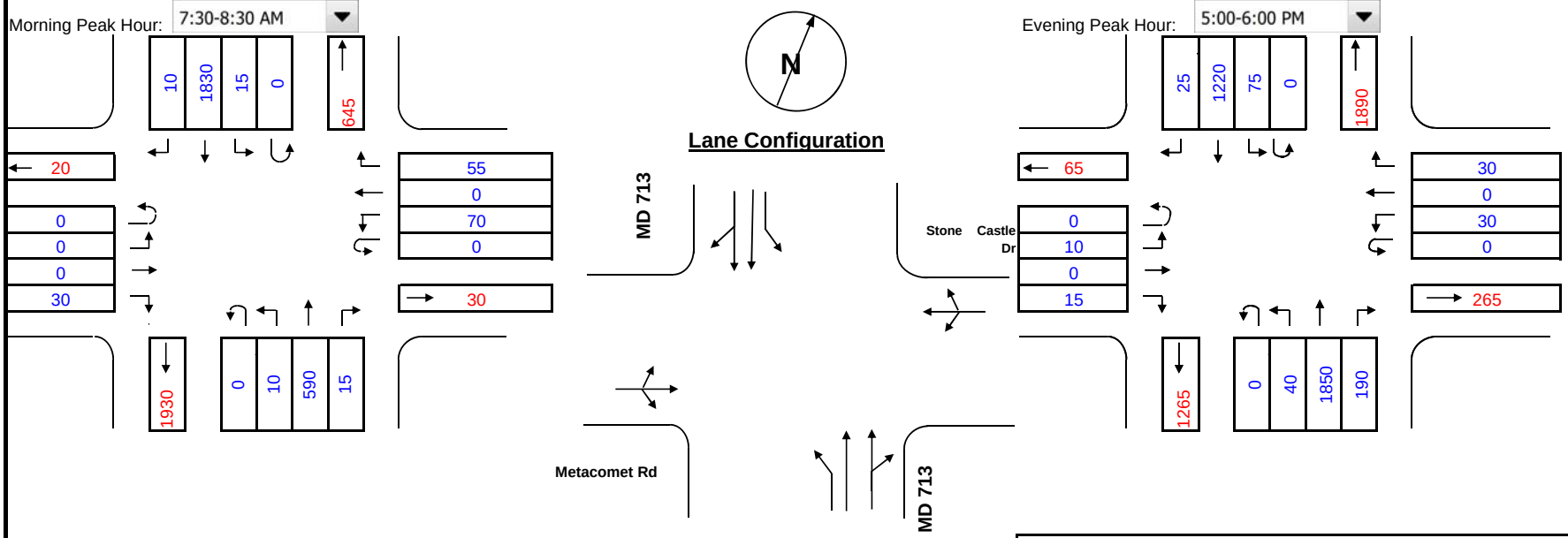
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	1.00	A	<= 1000	<= 199	1.1
2	0.55	B	<= 1150	<= 599	2.0
3	0.40	C	<= 1300	<= 799	3.0
4	0.30	D	<= 1450	<= 999	4.0
5	0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- ( ) Signal
- (•) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	590	0.55	325	15	340			NB	1850	0.55	1018	75	1093	*
	SB	1840	0.55	1012	10	1022	*		SB	1245	0.55	685	40	725	
	EB	30	1.00	30	70	100			EB	26	1.00	26	30	56	
	WB	132	1.00	132	0	132	*		WB	63	1.00	63	10	73	*
Remarks:			* Critical volume		Total	1154		Remarks:			* Critical volume		Total	1166	
					Level of service (V/C)	0.72	C						Level of service (V/C)	0.73	C

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Stone Castle Dr/Metacomet Rd

Conditions: Build

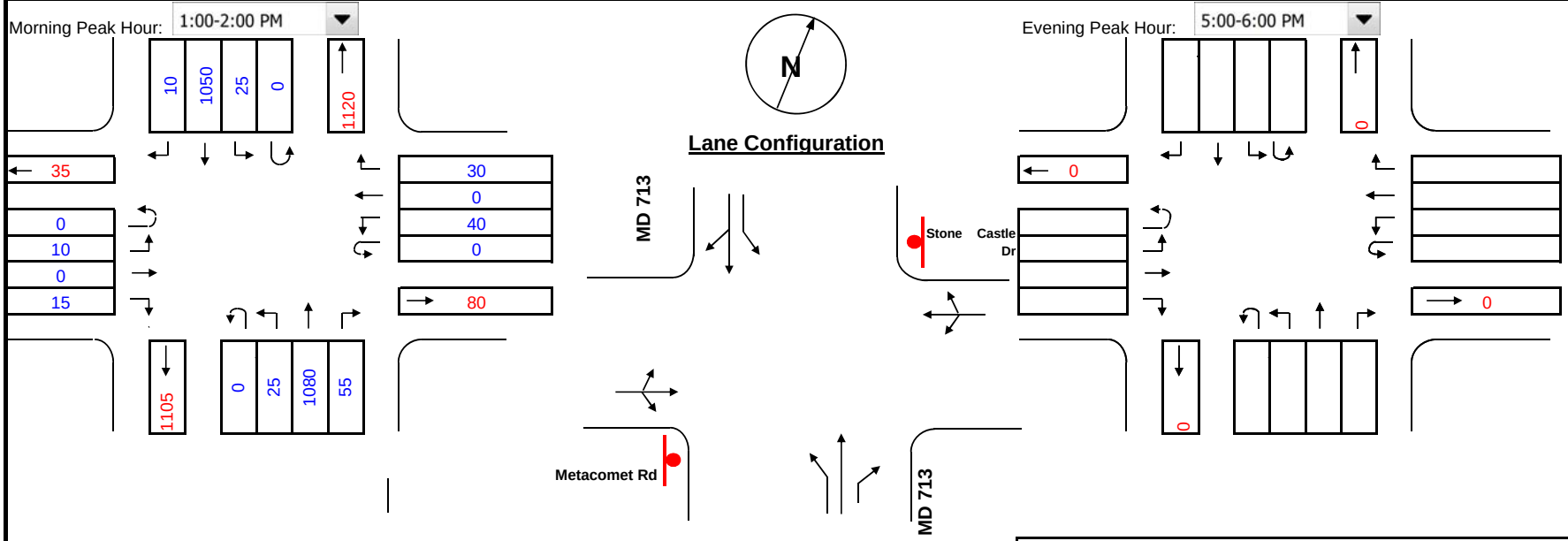
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- ☐ Northbound
- ☐ Southbound
- ☐ Eastbound
- ☐ Westbound

Split Phasing
- ○ East/West
- ○ North/South
- ◉ None

Inx. Control
- ○ Signal
- ◉ Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	1080	0.55	594	25	619	*		NB	0	0.55	0	0	0	
	SB	1060	0.55	583	25	608			SB	0	0.55	0	0	0	
	EB	26	1.00	26	40	66			EB	0	1.00	0	0	0	
	WB	74	1.00	74	10	84	*		WB	0	1.00	0	0	0	
Remarks:			* Critical volume		Total	703		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.44	A						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 atRidgewood Rd/Severn Rd

Conditions: Existing

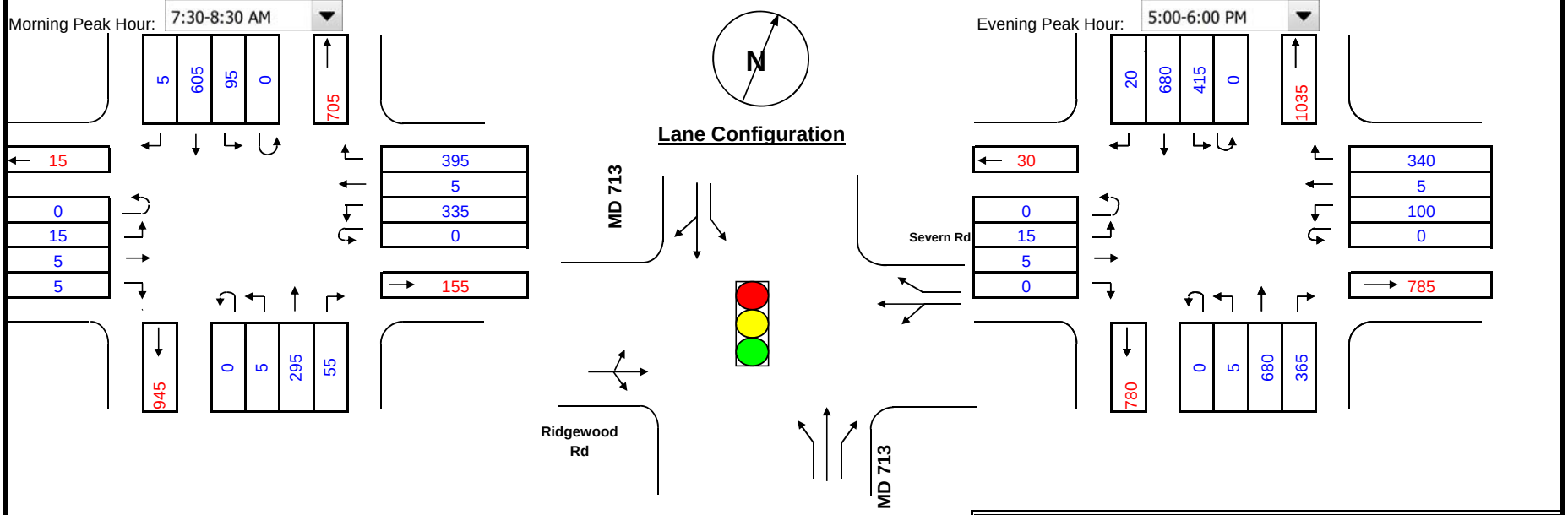
Design Year: 2015

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [ ] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	295	1.00	295	95	390			NB	680	1.00	680	415	1095	*
	SB	610	1.00	610	5	615	*		SB	700	1.00	700	5	705	
	EB	40	1.00	40	335	375			EB	35	1.00	35	100	135	*
	WB	374	1.00	374	15	389	*		WB	115	1.00	115	15	130	
Remarks:			* Critical volume		Total	1004		Remarks:			* Critical volume		Total	1230	
					Level of service (V/C)	0.63	B						Level of service (V/C)	0.77	C

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 atRidgewood Rd/Severn Rd

Conditions: Existing

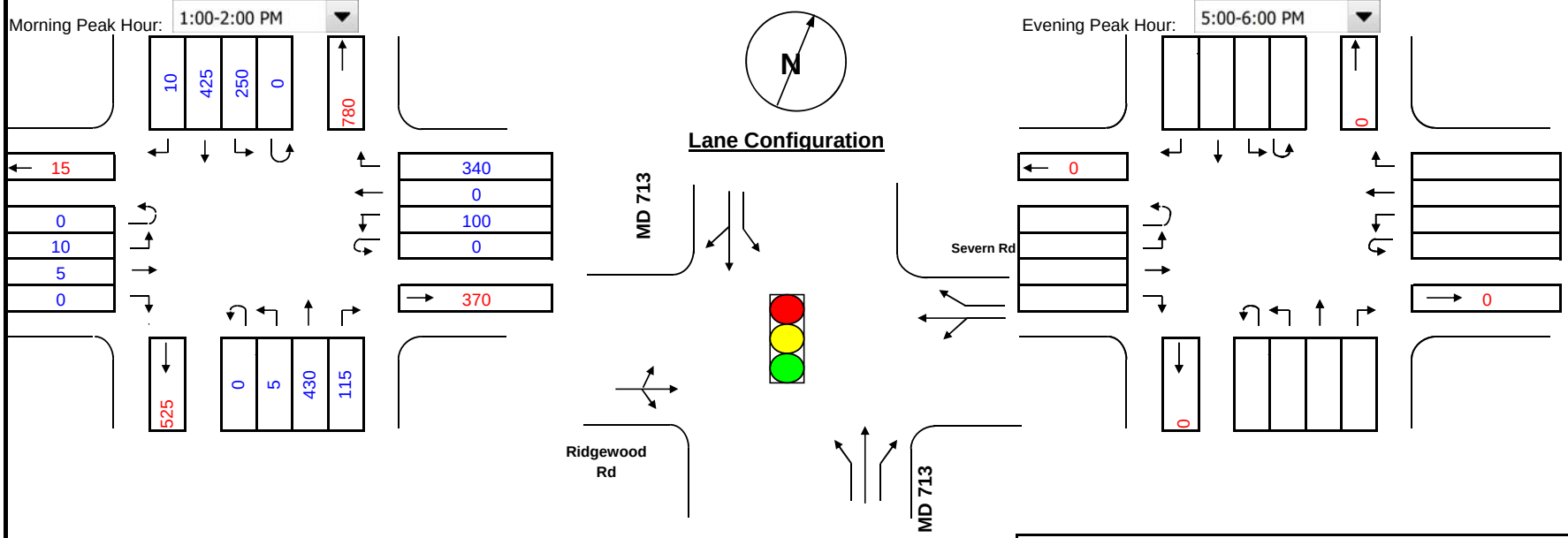
Design Year: 2015

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [ ] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	430	1.00	430	250	680	*		NB	0	1.00	0	0	0	
	SB	435	1.00	435	5	440			SB	0	1.00	0	0	0	
	EB	235	1.00	235	100	335	*		EB	0	1.00	0	0	0	
	WB	110	1.00	110	10	120			WB	0	1.00	0	0	0	
Remarks:			* Critical volume		Total	1015		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.63	B						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 atRidgewood Rd/Severn Rd

Conditions: No Build

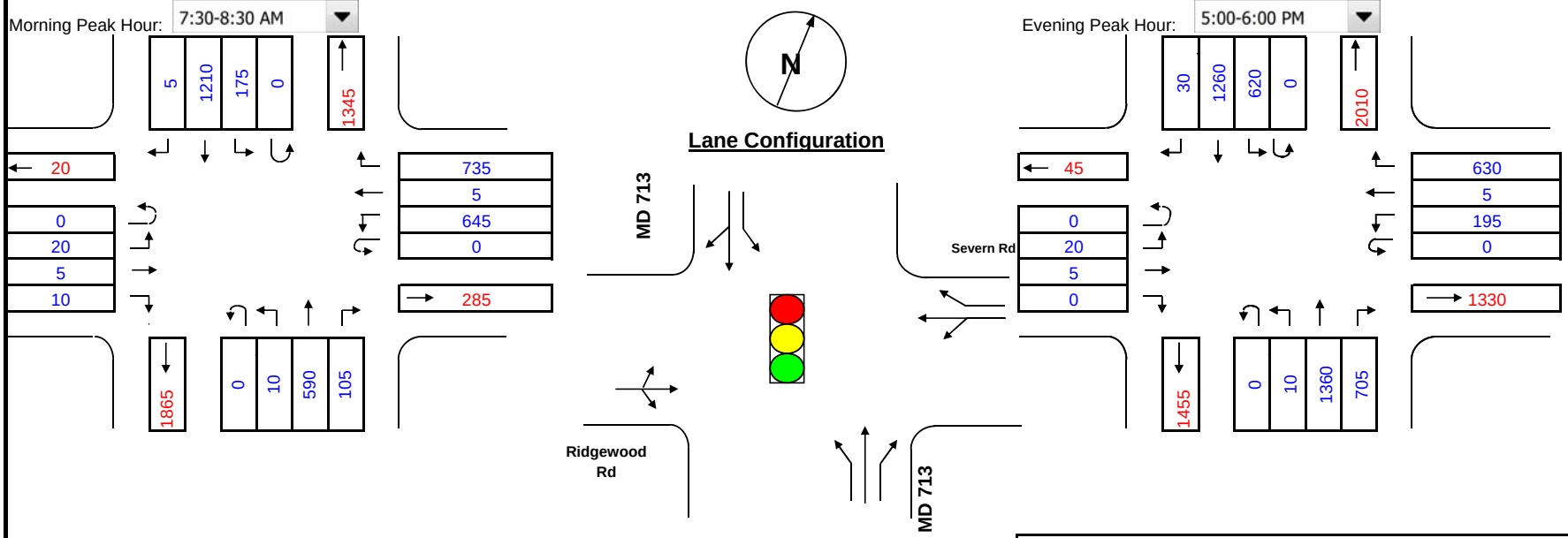
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	1.00	A	<= 1000	<= 199	1.1
2	0.55	B	<= 1150	<= 599	2.0
3	0.40	C	<= 1300	<= 799	3.0
4	0.30	D	<= 1450	<= 999	4.0
5	0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [ ] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*
	NB	590	1.00	590	175	765	
	SB	1215	1.00	1215	10	1225	*
	EB	75	1.00	75	645	720	
	WB	715	1.00	715	20	735	*

Remarks:

* Critical volume Total **1960**

Level of service (V/C) **1.22** **F**

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	1360	1.00	1360	620	1980	*
	SB	1290	1.00	1290	10	1300	
	EB	65	1.00	65	195	260	*
	WB	220	1.00	220	20	240	

Remarks:

* Critical volume Total **2240**

Level of service (V/C) **1.40** **F**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 atRidgewood Rd/Severn Rd

Conditions: No Build

Design Year: 2040

Computed by: JC

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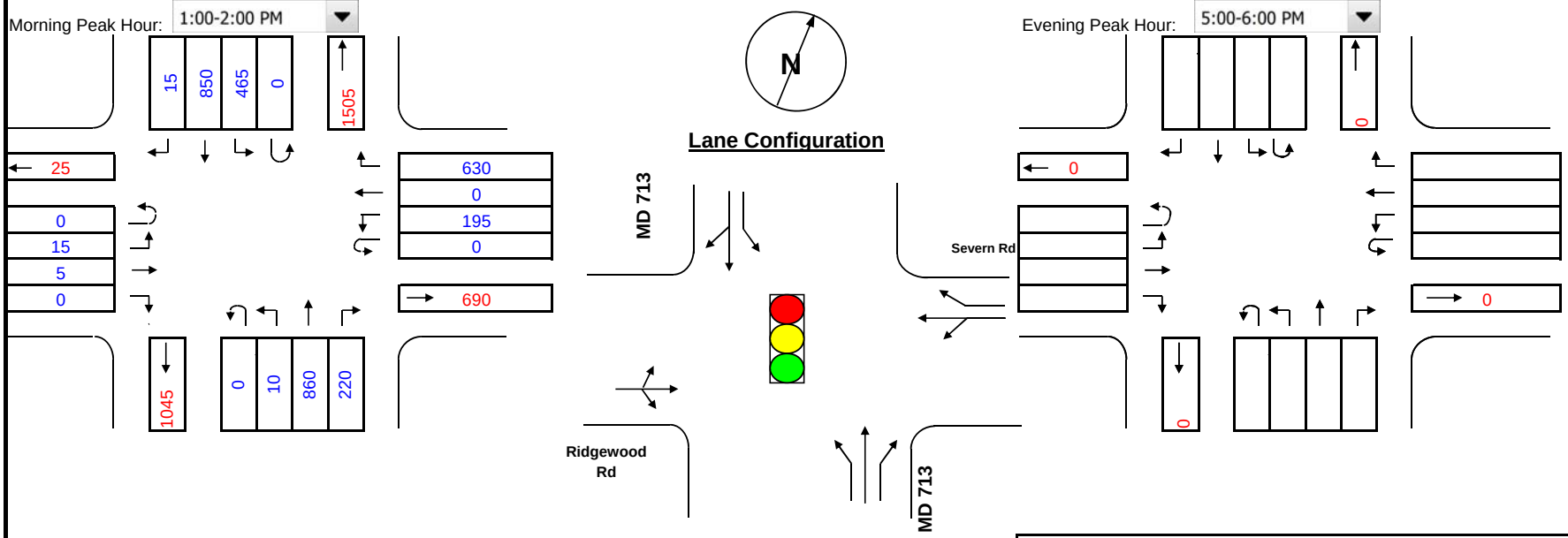
Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [ ] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	860	1.00	860	465	1325	*		NB	0	1.00	0	0	0	
	SB	865	1.00	865	10	875			SB	0	1.00	0	0	0	
	EB	50	1.00	50	195	245	*		EB	0	1.00	0	0	0	
	WB	215	1.00	215	15	230			WB	0	1.00	0	0	0	
Remarks:			* Critical volume		Total	1570		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.98	E						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 atRidgewood Rd/Severn Rd

Conditions: Build

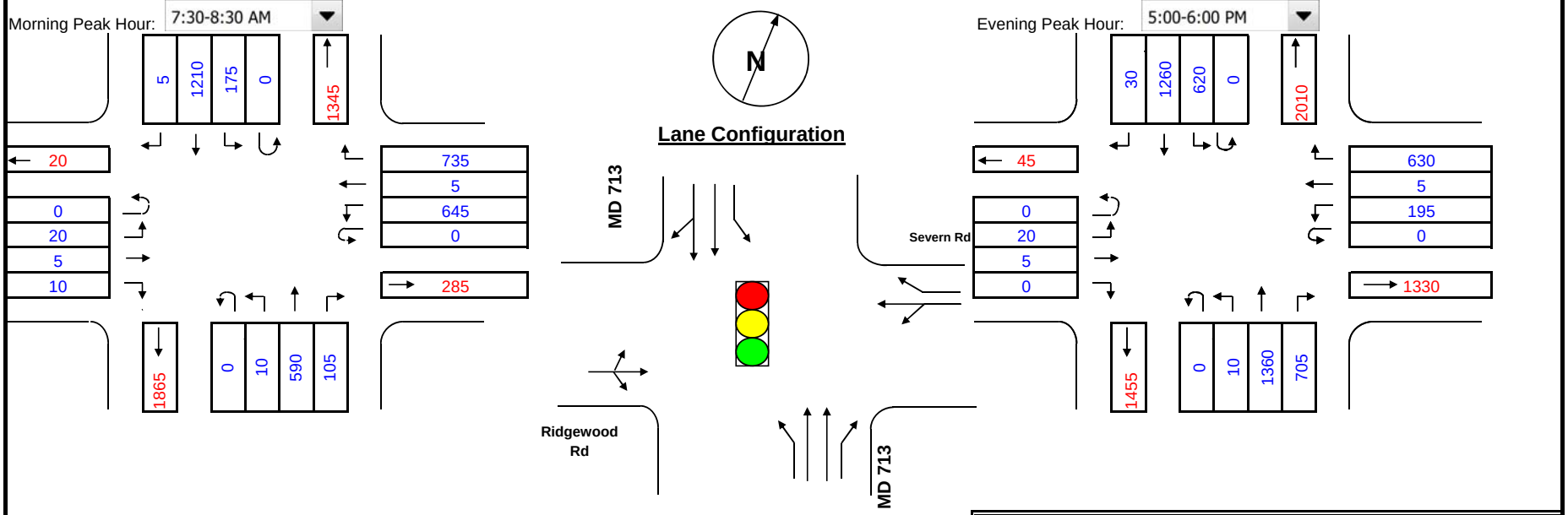
Design Year: 2040

Computed by: JC

Date 7/26/2016

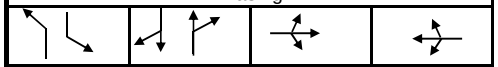
Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing



RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [ ] Eastbound
- [x] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	590	0.55	325	105	430			NB	1360	0.55	748	372	1120	*
	SB	1215	0.55	668	10	678	*		SB	1290	0.55	710	10	720	
	EB	35	1.00	35	0	35	*		EB	25	1.00	25	0	25	*
	WB	650	1.00	650	0	650	*		WB	200	1.00	200	0	200	*
Remarks:			* Critical volume		Total	1363		Remarks:			* Critical volume		Total	1345	
					Level of service (V/C)	0.85	D						Level of service (V/C)	0.84	D

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 atRidgewood Rd/Severn Rd

Conditions: No Build

Design Year: 2040

Computed by: JC

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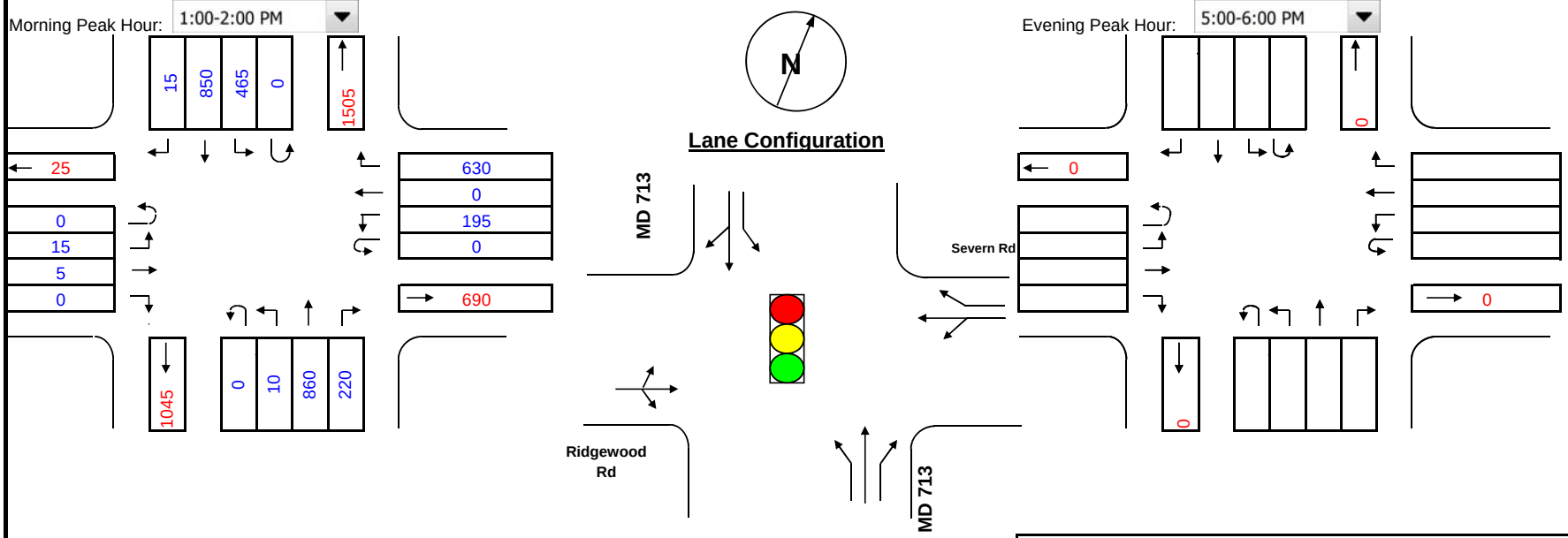


Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1 =	1.00	A <=	1000	<= 199	1.1
2 =	0.55	B <=	1150	<= 599	2.0
3 =	0.40	C <=	1300	<= 799	3.0
4 =	0.30	D <=	1450	<= 999	4.0
5 =	0.25	E <=	1600	> 1000	5.0
Dbl-Lt =	0.60	F >	1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [ ] Eastbound
- [x] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*
	NB	860	0.55	473	279	752	*
	SB	865	0.55	476	10	486	
	EB	20	1.00	20	0	20	*
	WB	195	1.00	195	0	195	*

Remarks:

* Critical volume Total **967**

Level of service (V/C) **0.60** **A**

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	0	0.55	0	0	0	
	SB	0	0.55	0	0	0	
	EB	0	1.00	0	0	0	*
	WB	0	1.00	0	0	0	*

Remarks:

* Critical volume Total **0**

Level of service (V/C) **0.00** **A**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Watts Ave/Ridge Forest Way

Conditions: Existing

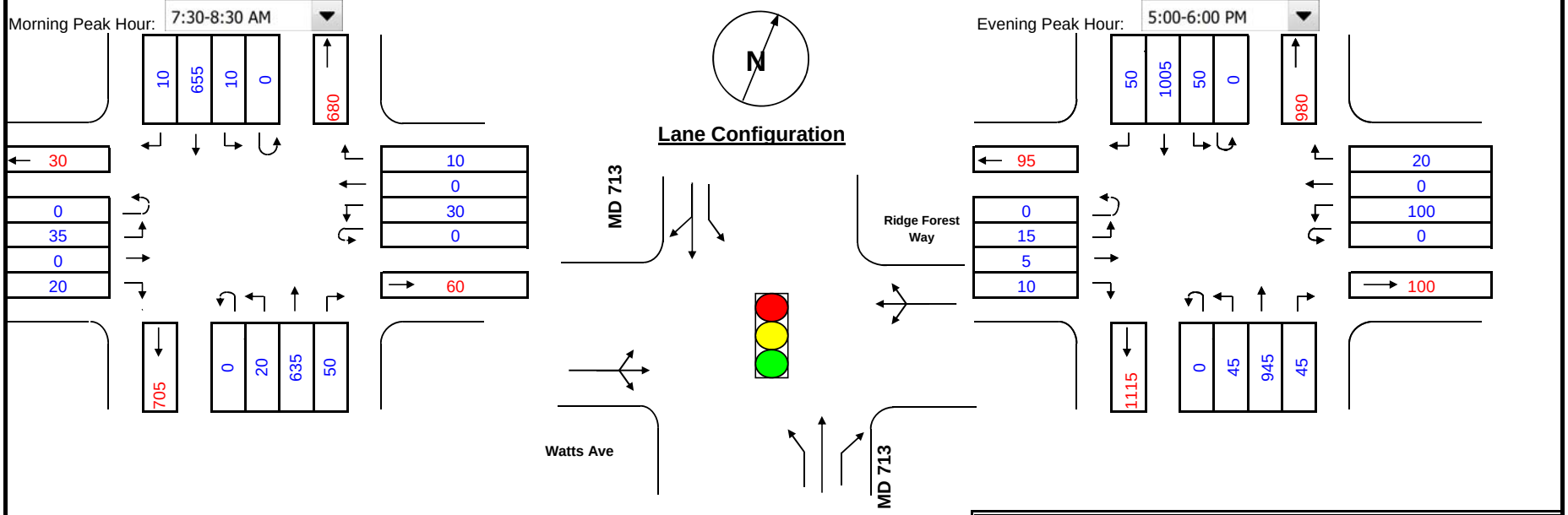
Design Year: 2015

Computed by: JC

Date 7/26/2016

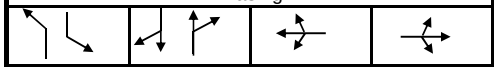
Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing



RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [ ] Eastbound
- [ ] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	635	1.00	635	10	645			NB	945	1.00	945	50	995	
	SB	665	1.00	665	20	685	*		SB	1055	1.00	1055	45	1100	*
	EB	55	1.00	55	0	55	*		EB	30	1.00	30	0	30	*
	WB	40	1.00	40	0	40	*		WB	120	1.00	120	0	120	*
Remarks:			* Critical volume		Total	780		Remarks:			* Critical volume		Total	1250	
					Level of service (V/C)	0.49	A						Level of service (V/C)	0.78	C

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Watts Ave/Ridge Forest Way

Conditions: Existing

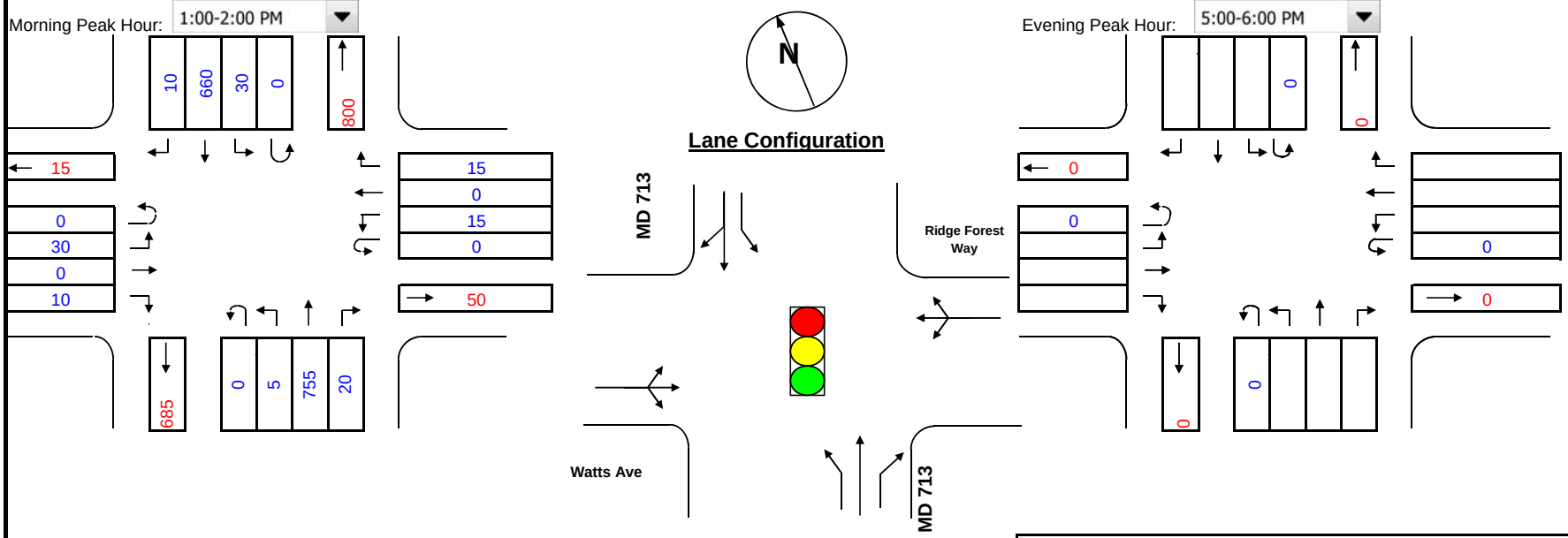
Design Year: 2015

Computed by: JC

Date 7/26/2016

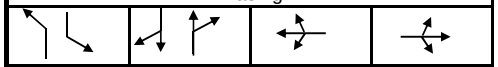
Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing



RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [ ] Eastbound
- [ ] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	755	1.00	755	30	785	*		NB	0	1.00	0	0	0	
	SB	670	1.00	670	5	675			SB	0	1.00	0	0	0	
	EB	40	1.00	40	0	40	*		EB	0	1.00	0	0	0	*
	WB	30	1.00	30	0	30	*		WB	0	1.00	0	0	0	*
Remarks:			* Critical volume		Total	855		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.53	A						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Watts Ave/Ridge Forest Way

Conditions: Existing

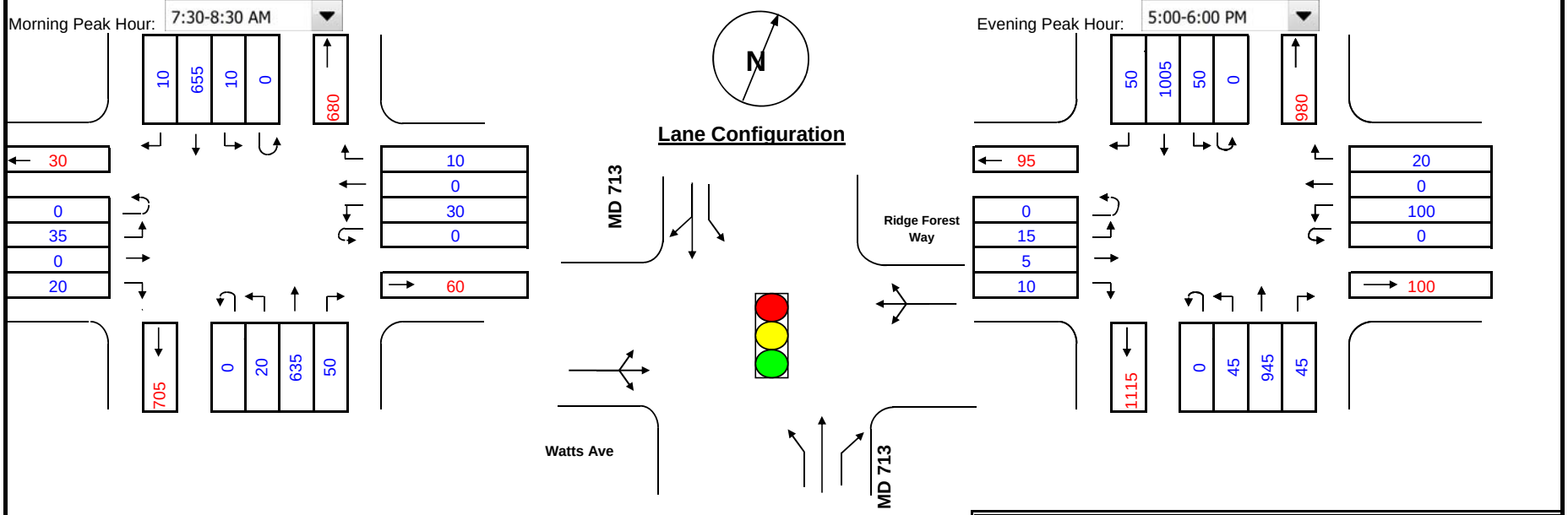
Design Year: 2015

Computed by: JC

Date 7/26/2016

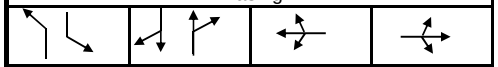
Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing



RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [ ] Eastbound
- [ ] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	635	1.00	635	10	645			NB	945	1.00	945	50	995	
	SB	665	1.00	665	20	685	*		SB	1055	1.00	1055	45	1100	*
	EB	55	1.00	55	0	55	*		EB	30	1.00	30	0	30	*
	WB	40	1.00	40	0	40	*		WB	120	1.00	120	0	120	*
Remarks:			* Critical volume		Total	780		Remarks:			* Critical volume		Total	1250	
					Level of service (V/C)	0.49	A						Level of service (V/C)	0.78	C

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Watts Ave/Ridge Forest Way

Conditions: ST Imp

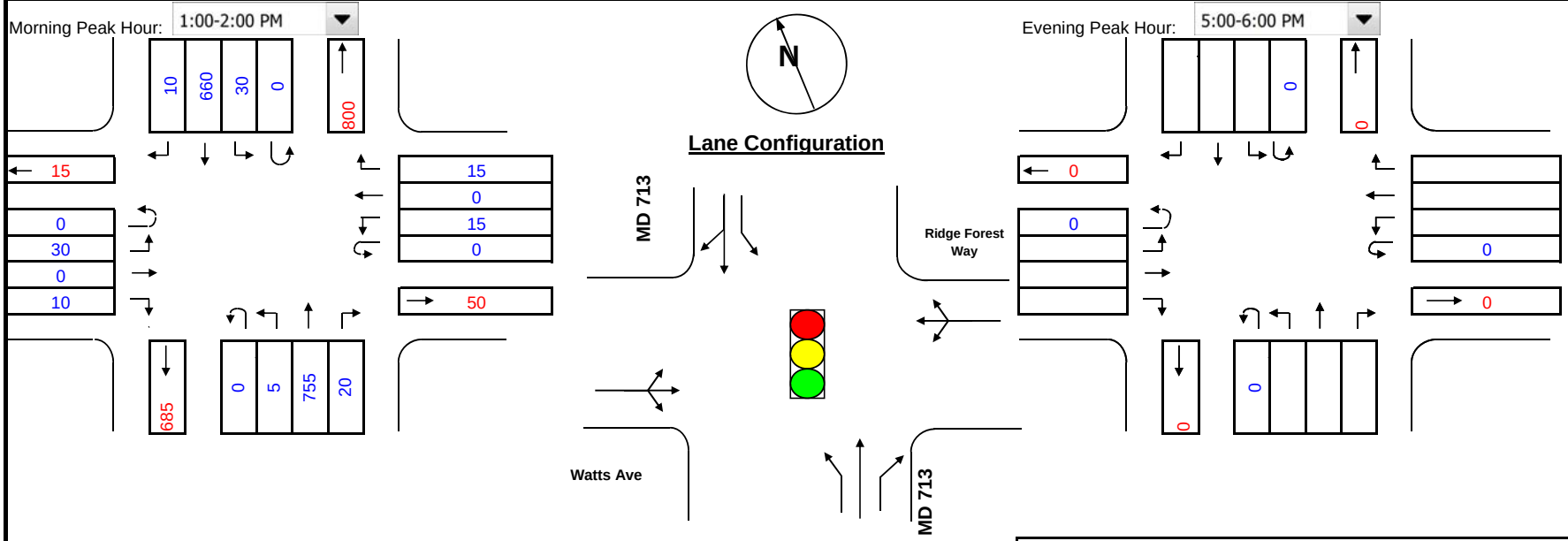
Design Year: 2015

Computed by: JC

Date 7/26/2016

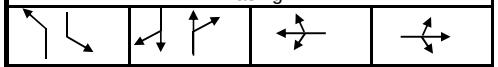
Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing



RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [ ] Eastbound
- [ ] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*
	NB	755	1.00	755	30	785	*
	SB	670	1.00	670	5	675	
	EB	40	1.00	40	0	40	*
	WB	30	1.00	30	0	30	*

Remarks:

* Critical volume Total **855**

Level of service (V/C) **0.53** **A**

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	0	1.00	0	0	0	
	SB	0	1.00	0	0	0	
	EB	0	1.00	0	0	0	*
	WB	0	1.00	0	0	0	*

Remarks:

* Critical volume Total **0**

Level of service (V/C) **0.00** **A**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Watts Ave/Ridge Forest Way

Conditions: No Build

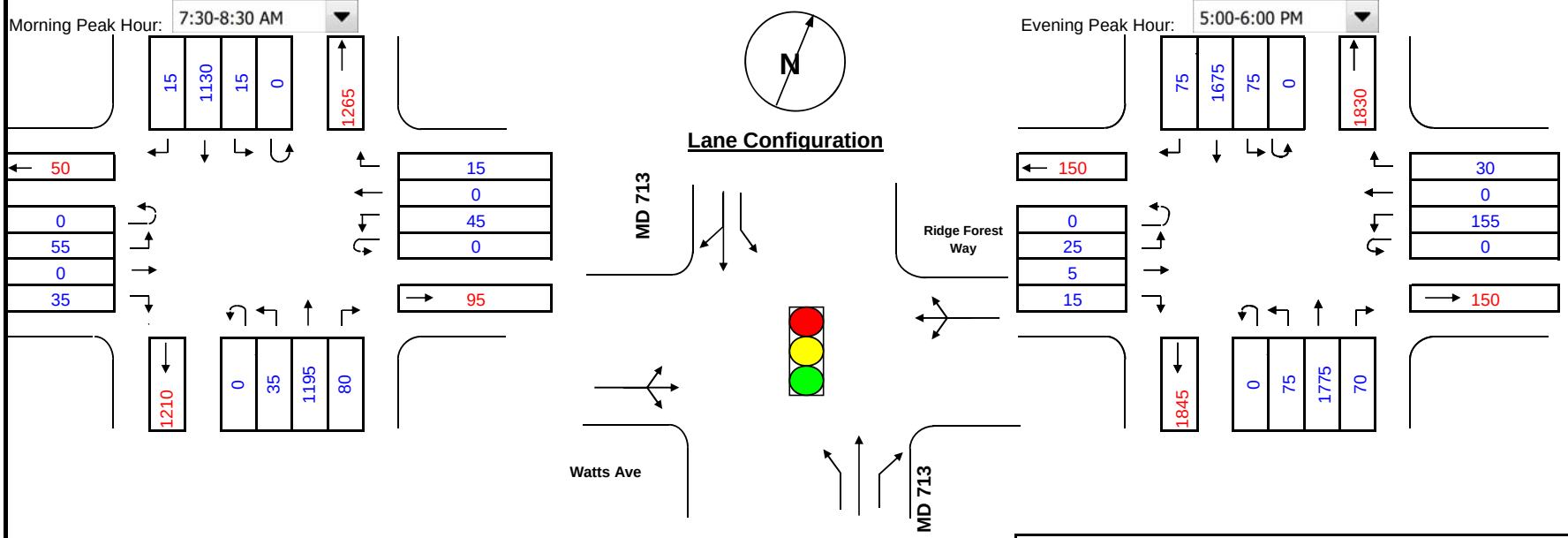
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [ ] Eastbound
- [ ] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	1195	1.00	1195	15	1210	*		NB	1775	1.00	1775	75	1850	*
	SB	1145	1.00	1145	35	1180			SB	1750	1.00	1750	75	1825	
	EB	90	1.00	90	0	90	*		EB	45	1.00	45	0	45	*
	WB	60	1.00	60	0	60	*		WB	185	1.00	185	0	185	*
Remarks:			* Critical volume		Total	1360		Remarks:			* Critical volume		Total	2080	
					Level of service (V/C)	0.85	D						Level of service (V/C)	1.30	F

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Watts Ave/Ridge Forest Way

Conditions: No Build

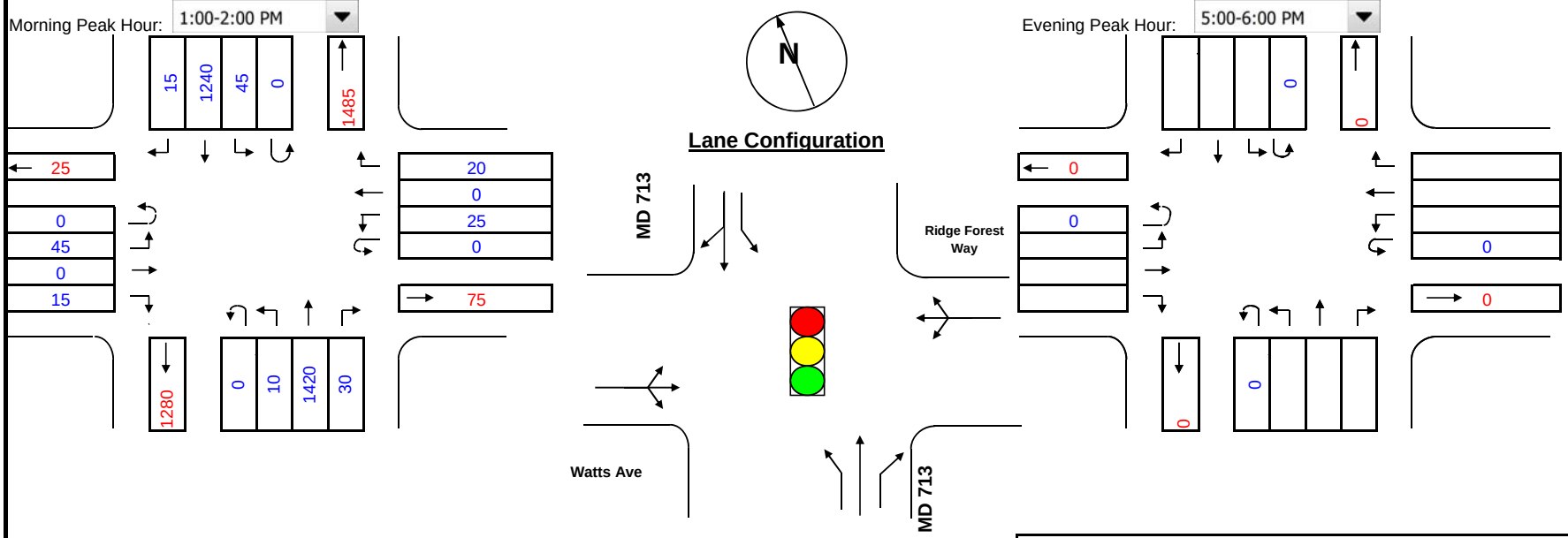
Design Year: 2040

Computed by: JC

Date 7/26/2016

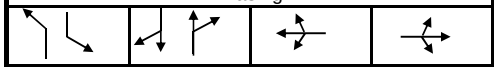
Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing



RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [ ] Eastbound
- [ ] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*
	NB	1420	1.00	1420	45	1465	*
	SB	1255	1.00	1255	10	1265	
	EB	60	1.00	60	0	60	*
	WB	45	1.00	45	0	45	*

Remarks:

* Critical volume Total **1570**

Level of service (V/C) **0.98** **E**

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	0	1.00	0	0	0	
	SB	0	1.00	0	0	0	
	EB	0	1.00	0	0	0	*
	WB	0	1.00	0	0	0	*

Remarks:

* Critical volume Total **0**

Level of service (V/C) **0.00** **A**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Watts Ave/Ridge Forest Way

Conditions: Build

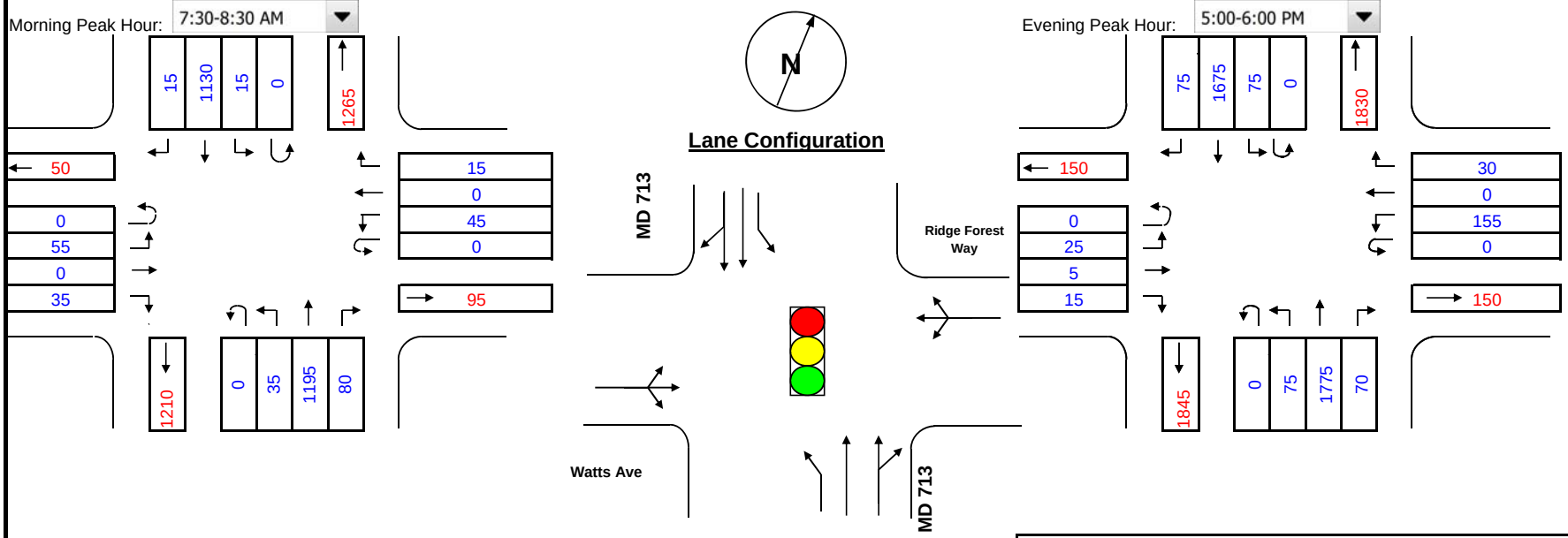
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	1.00	A	<= 1000	<= 199	1.1
2	0.55	B	<= 1150	<= 599	2.0
3	0.40	C	<= 1300	<= 799	3.0
4	0.30	D	<= 1450	<= 999	4.0
5	0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	0.60	F	> 1600		

Phasing

RTOR/Overlap: [x] Northbound [ ] Southbound [ ] Eastbound [ ] Westbound

Split Phasing: ( ) East/West ( ) North/South (•) None

Inx. Control: (•) Signal ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical ln. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical ln. Volume	*
	NB	1195	0.55	657	15	672	*		NB	1775	0.55	976	75	1051	*
	SB	1145	0.55	630	35	665			SB	1750	0.55	963	75	1038	
	EB	96	1.00	96	45	141	*		EB	48	1.00	48	155	203	
	WB	65	1.00	65	55	120			WB	201	1.00	201	25	226	*
Remarks:			* Critical volume		Total	813		Remarks:			* Critical volume		Total	1277	
					Level of service (V/C)	0.51	A						Level of service (V/C)	0.80	C

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Watts Ave/Ridge Forest Way

Conditions: Build

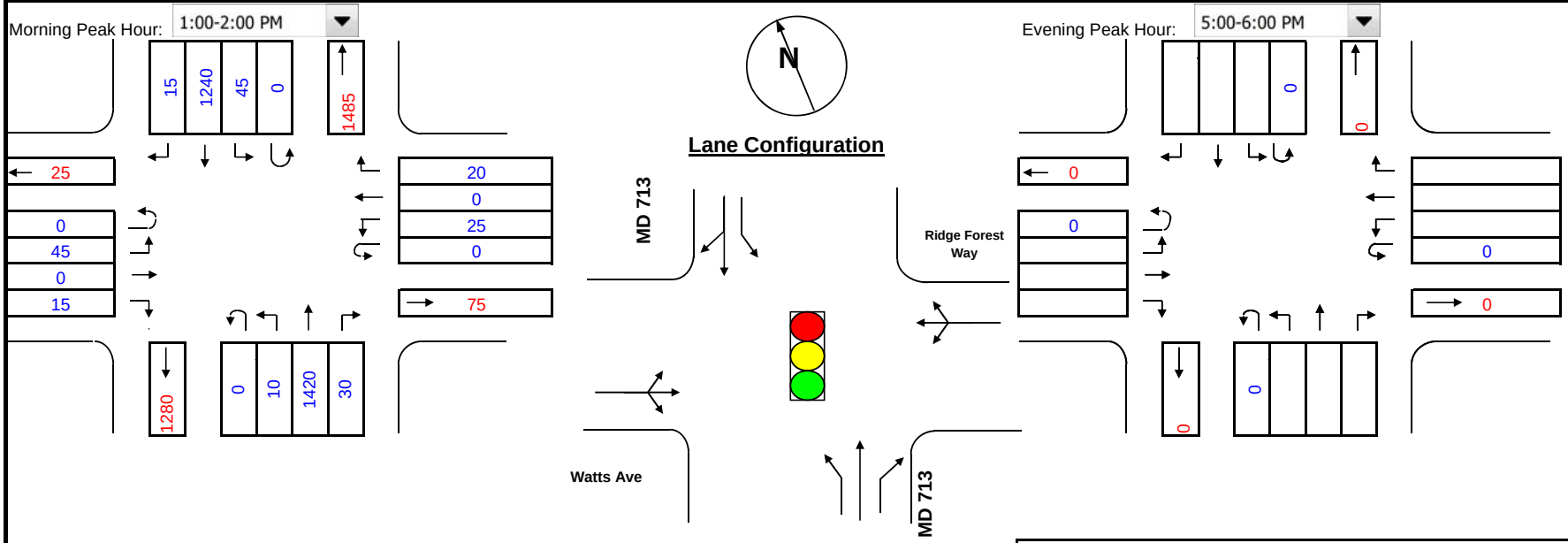
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [ ] Eastbound
- [ ] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	1420	0.55	781	45	826	*		NB	0	0.55	0	0	0	
	SB	1255	0.55	690	10	700			SB	0	0.55	0	0	0	
	EB	65	1.00	65	25	90			EB	0	1.00	0	0	0	
	WB	48	1.00	48	45	93	*		WB	0	1.00	0	0	0	
Remarks:			* Critical volume		Total	**919**		Remarks:			* Critical volume		Total	**0**	
					Level of service (V/C)	**0.57**	**A**						Level of service (V/C)	**0.00**	**A**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Ridgewood Rd/Severn Rd

Conditions: Existing

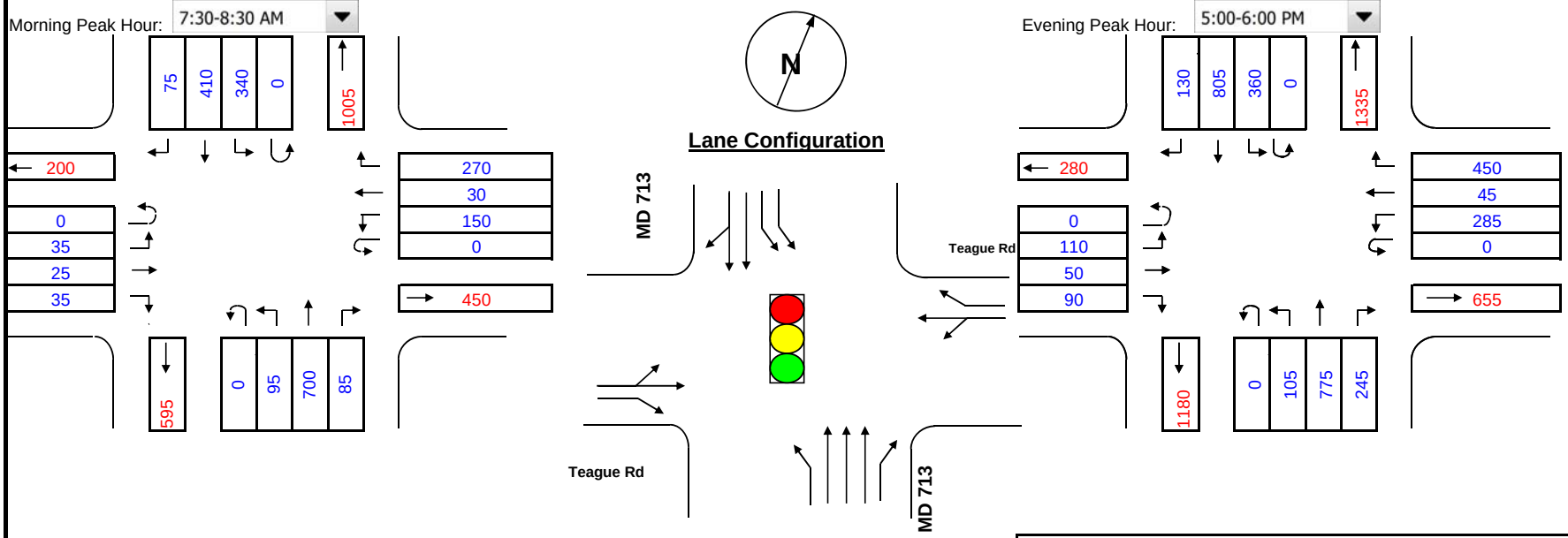
Design Year: 2015

Computed by: JC

Date 7/26/2016

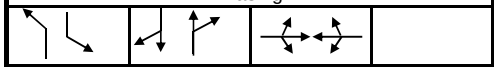
Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing



RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	700	0.40	280	204	484	*		NB	775	0.40	310	216	526	
	SB	485	0.55	267	95	362			SB	935	0.55	514	105	619	*
	EB	95	1.00	95	150	245	*		EB	270	1.00	270	285	555	*
	WB	195	1.00	195	35	230			WB	359	1.00	359	110	469	
Remarks:			* Critical volume		Total	729		Remarks:			* Critical volume		Total	1174	
					Level of service (V/C)	0.46	A						Level of service (V/C)	0.73	C

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Teague

Conditions: Existing

Design Year: 2015

Computed by: JC

Date 7/26/2016

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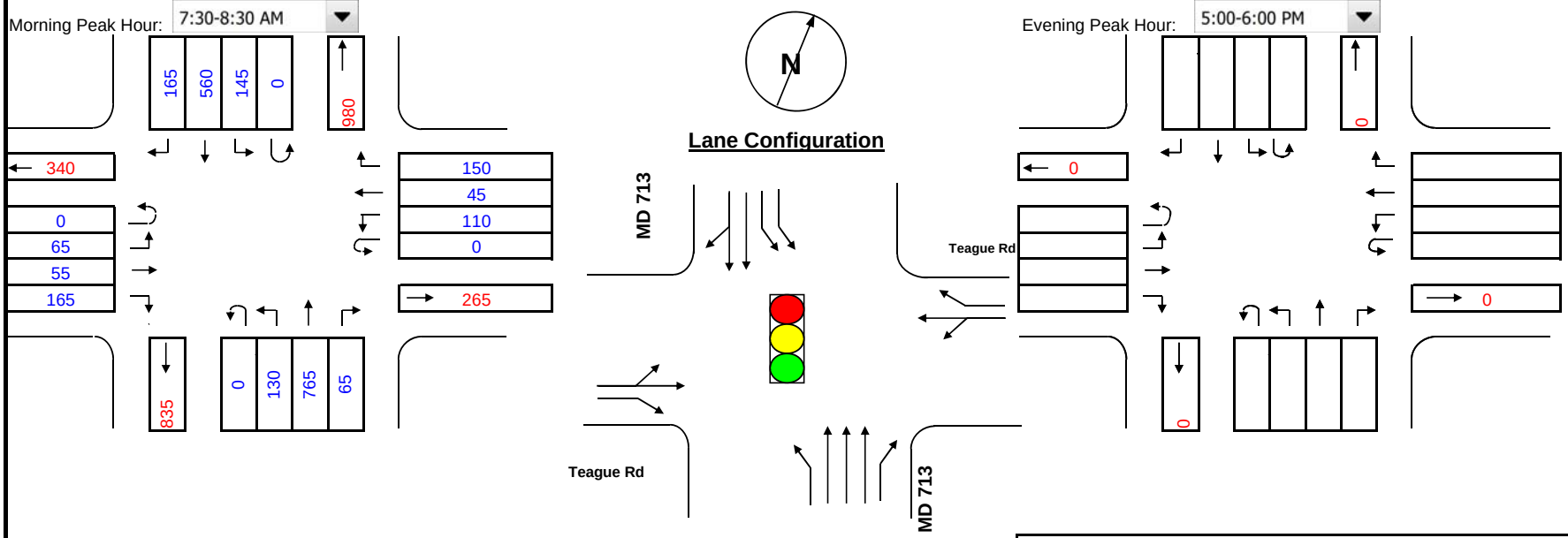
Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	1.00	A	<= 1000	<= 199	1.1
2	0.55	B	<= 1150	<= 599	2.0
3	0.40	C	<= 1300	<= 799	3.0
4	0.30	D	<= 1450	<= 999	4.0
5	0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	765	0.40	306	87	393			NB	0	0.40	0	0	0	
	SB	725	0.55	399	130	529	*		SB	0	0.55	0	0	0	
	EB	127	1.00	127	110	237			EB	0	1.00	0	0	0	
	WB	265	1.00	265	65	330	*		WB	0	1.00	0	0	0	
Remarks:			* Critical volume		Total	859		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.54	A						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Ridgewood Rd/Severn Rd

Conditions: ST Imp

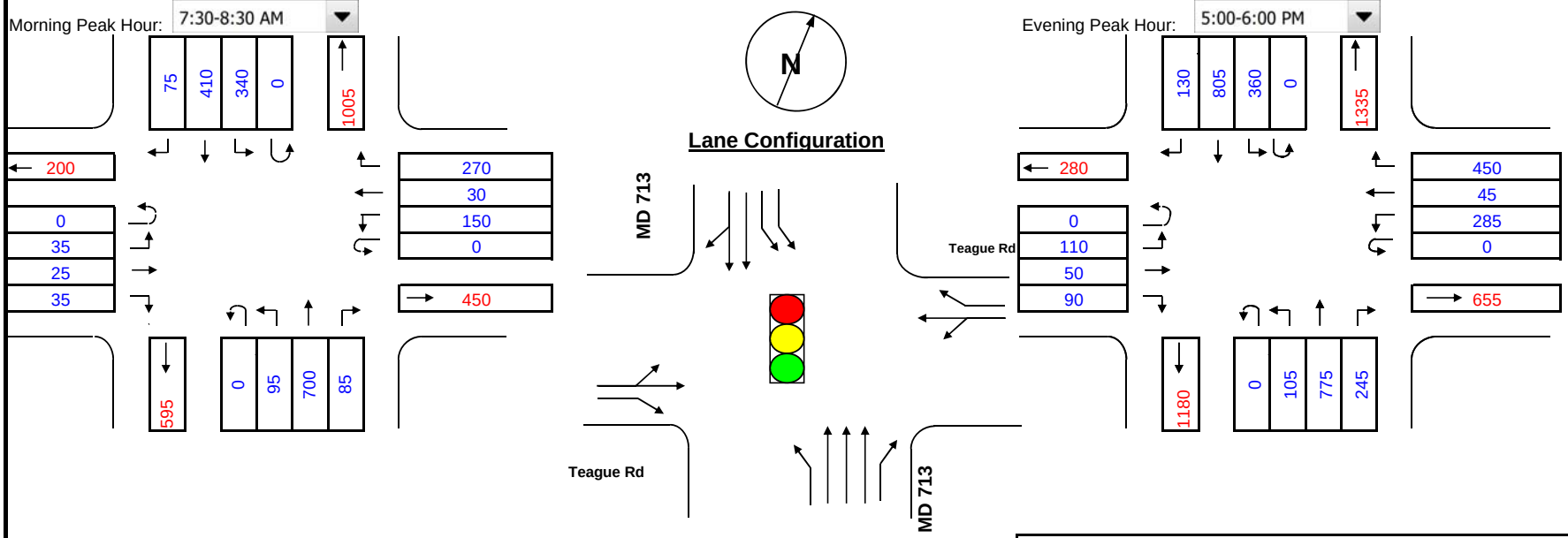
Design Year: 2015

Computed by: JC

Date 7/26/2016

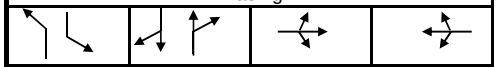
Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing



RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	700	0.40	280	204	484	*		NB	775	0.40	310	216	526	
	SB	485	0.55	267	95	362			SB	935	0.55	514	105	619	*
	EB	64	1.00	64	0	64	*		EB	171	1.00	171	0	171	*
	WB	195	1.00	195	0	195	*		WB	359	1.00	359	0	359	*
Remarks:			* Critical volume		Total	743		Remarks:			* Critical volume		Total	1149	
					Level of service (V/C)	0.46	A						Level of service (V/C)	0.72	B

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Teague

Conditions: ST Imp

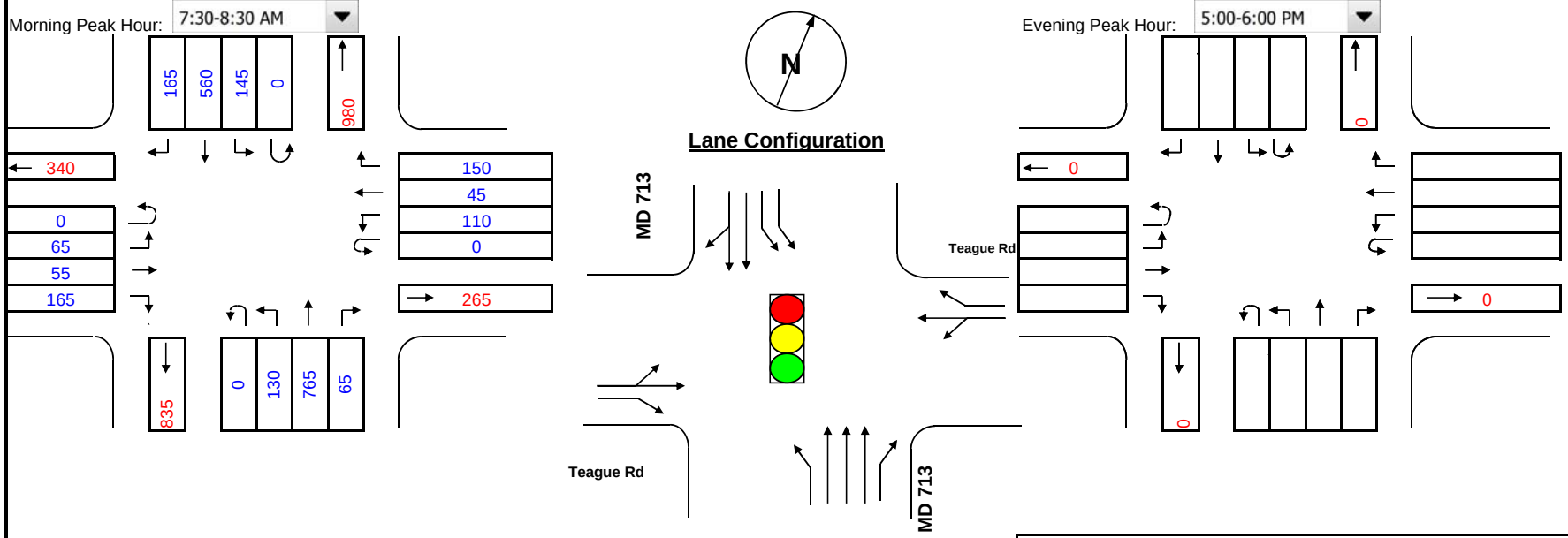
Design Year: 2015

Computed by: JC

Date 7/26/2016

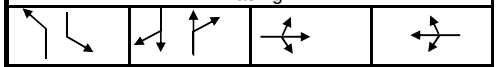
Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing



RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	765	0.40	306	87	393			NB	0	0.40	0	0	0	
	SB	725	0.55	399	130	529	*		SB	0	0.55	0	0	0	
	EB	127	1.00	127	0	127			EB	0	1.00	0	0	0	
	WB	166	1.00	166	0	166	*		WB	0	1.00	0	0	0	
Remarks:			* Critical volume		Total	695		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.43	A						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Ridgewood Rd/Severn Rd

Conditions: No Build

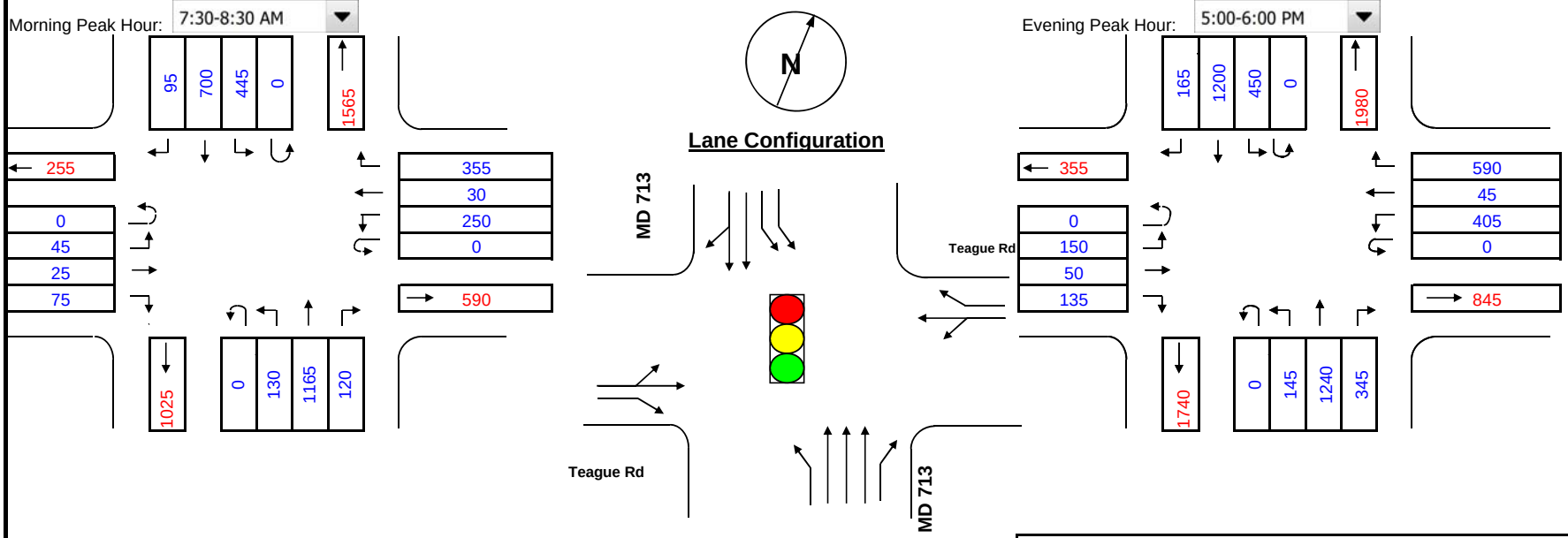
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	1165	0.40	466	267	733	*		NB	1240	0.40	496	270	766	
	SB	795	0.55	437	130	567			SB	1365	0.55	751	145	896	*
	EB	115	1.00	115	250	365	*		EB	500	1.00	500	405	905	*
	WB	305	1.00	305	45	350			WB	491	1.00	491	150	641	
Remarks:			* Critical volume		Total	1098		Remarks:			* Critical volume		Total	1801	
					Level of service (V/C)	0.69	B						Level of service (V/C)	1.13	F

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Teague

Conditions: No Build

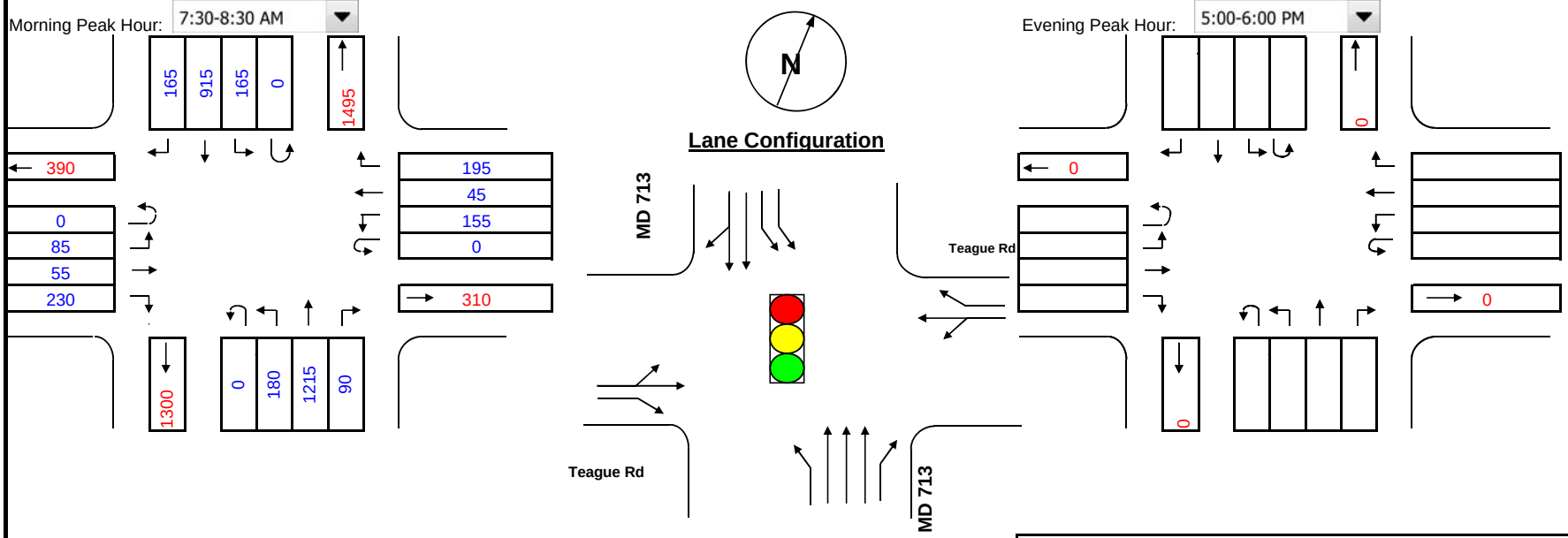
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	1215	0.40	486	99	585			NB	0	0.40	0	0	0	
	SB	1080	0.55	594	180	774	*		SB	0	0.55	0	0	0	
	EB	225	1.00	225	155	380			EB	0	1.00	0	0	0	
	WB	355	1.00	355	85	440	*		WB	0	1.00	0	0	0	
Remarks:			* Critical volume		Total	1214		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.76	C						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Ridgewood Rd/Severn Rd

Conditions: Build

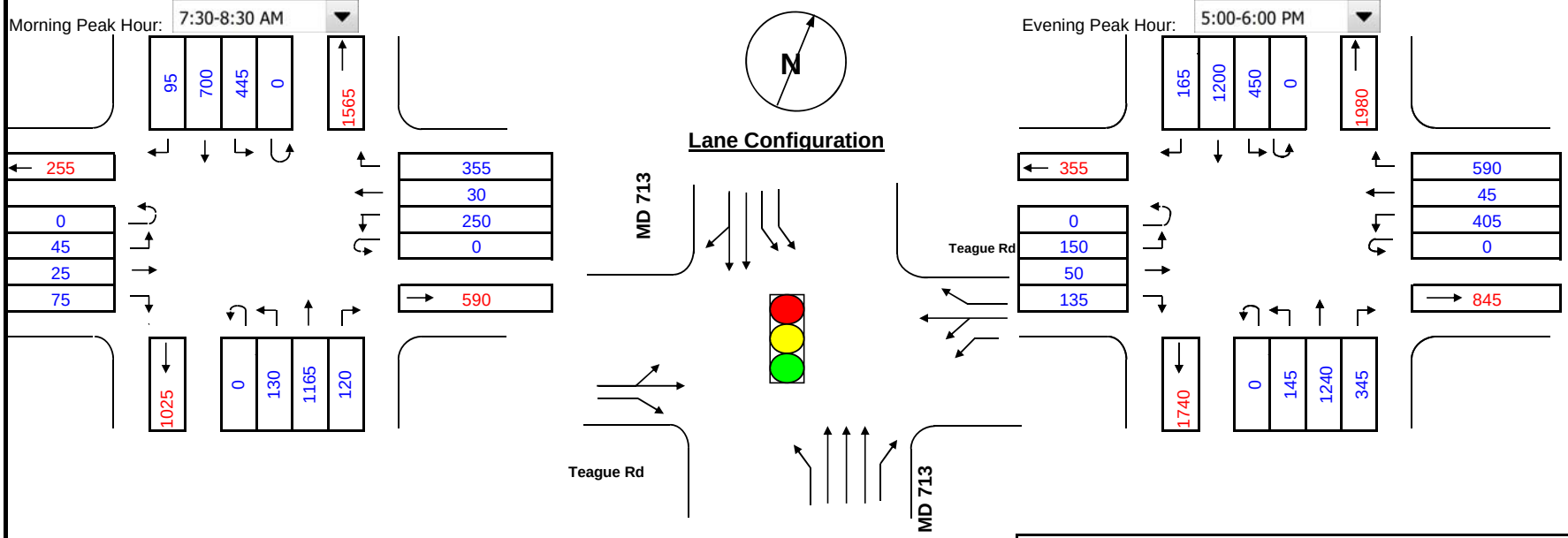
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	1.00	A	<= 1000	<= 199	1.1
2	0.55	B	<= 1150	<= 599	2.0
3	0.40	C	<= 1300	<= 799	3.0
4	0.30	D	<= 1450	<= 999	4.0
5	0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	1165	0.40	466	267	733	*		NB	1240	0.40	496	270	766	
	SB	795	0.55	437	130	567			SB	1365	0.55	751	145	896	*
	EB	70	1.00	70	0	70			EB	200	1.00	200	0	200	
	WB	280	0.60	168	0	168	*		WB	450	0.60	270	0	270	*
Remarks:			* Critical volume		Total	**901**		Remarks:			* Critical volume		Total	**1166**	
					Level of service (V/C)	**0.56**	**A**						Level of service (V/C)	**0.73**	**C**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Teague

Conditions: Build

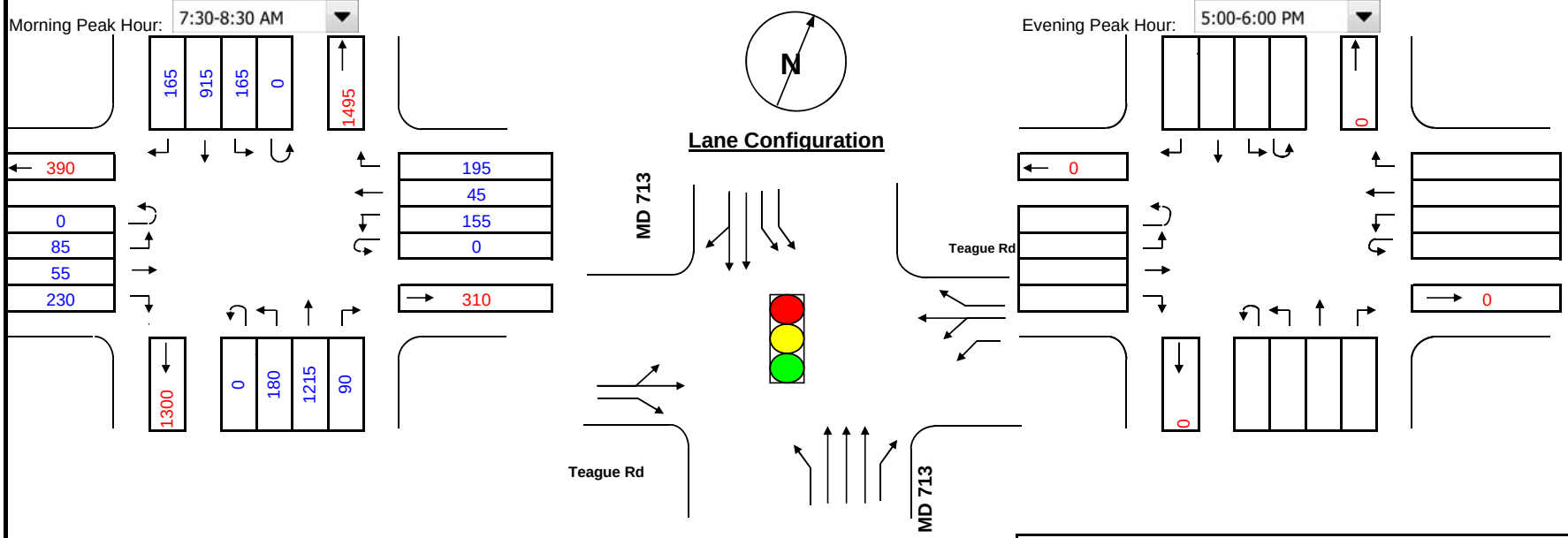
Design Year: 2040

Computed by: JC

Date 7/26/2016

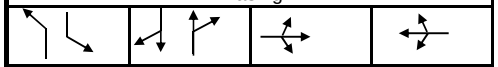
Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	1.00	A	<= 1000	<= 199	1.1
2	0.55	B	<= 1150	<= 599	2.0
3	0.40	C	<= 1300	<= 799	3.0
4	0.30	D	<= 1450	<= 999	4.0
5	0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	0.60	F	> 1600		

Phasing



RTOR/Overlap
- [x] Northbound
- [ ] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	1215	0.40	486	99	585			NB	0	0.40	0	0	0	
	SB	1080	0.55	594	180	774	*		SB	0	0.55	0	0	0	
	EB	140	1.00	140	0	140	*		EB	0	1.00	0	0	0	*
	WB	200	0.60	120	0	120	*		WB	0	0.60	0	0	0	*
Remarks:			* Critical volume		Total	1034		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.65	B						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Arundel Mills Blvd

Conditions: Existing

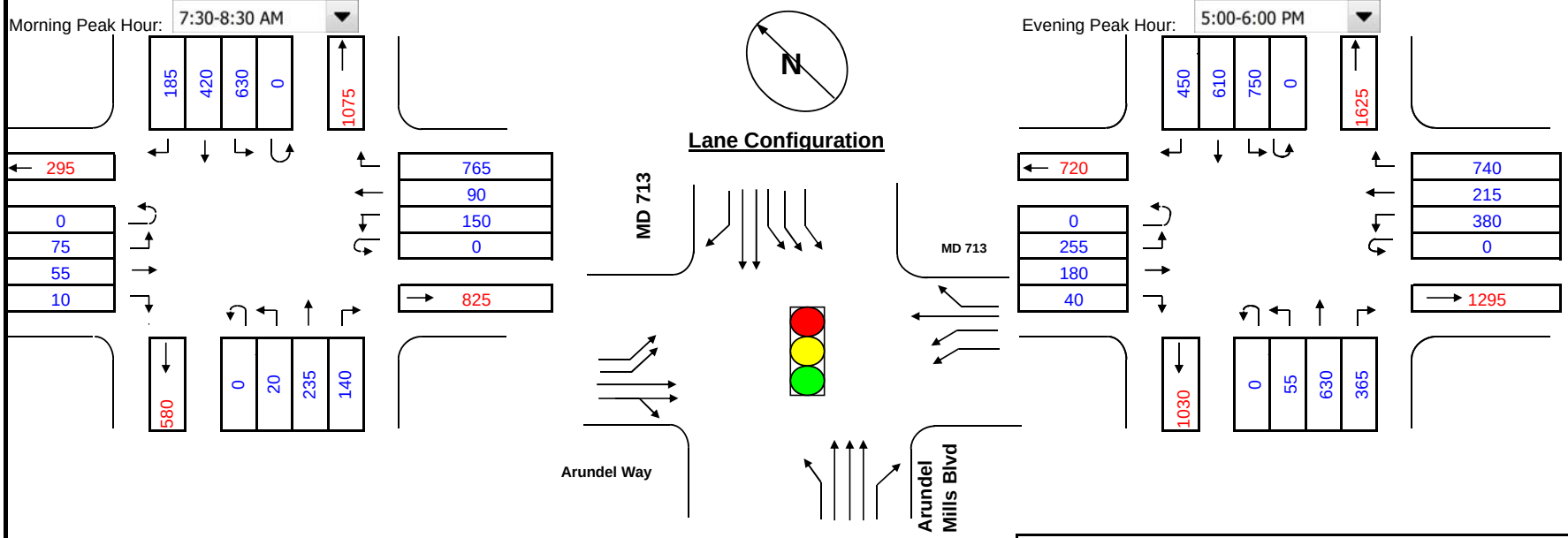
Design Year: 2015

Computed by: JC

Date 12/6/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [ ] Eastbound
- [x] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	235	0.40	94	252	346	*		NB	630	0.40	252	300	552	*
	SB	420	0.55	231	20	251			SB	610	0.55	336	55	391	
	EB	65	1.00	65	0	65	*		EB	255	0.60	153	0	153	*
	WB	513	1.00	513	0	513	*		WB	440	1.00	440	0	440	*
Remarks:			* Critical volume		Total	**924**		Remarks:			* Critical volume		Total	**1145**	
					Level of service (V/C)	**0.58**	**A**						Level of service (V/C)	**0.72**	**B**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Arundel Mills Blvd

Conditions: Existing

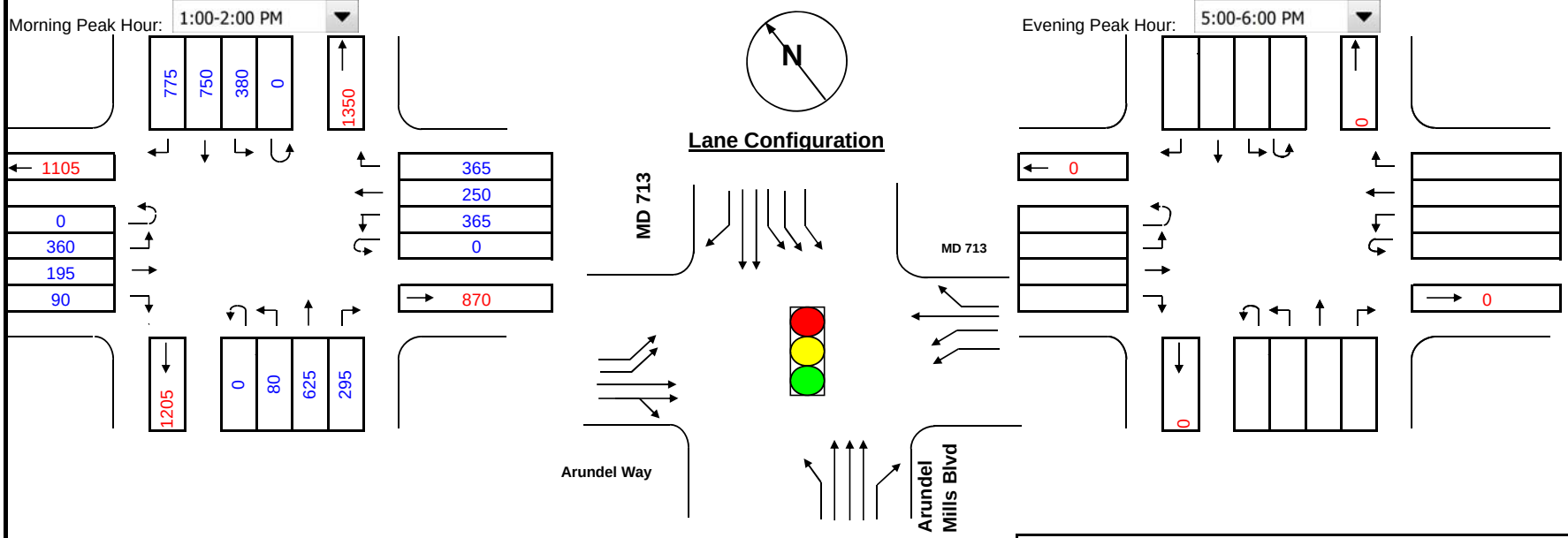
Design Year: 2015

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1 =	1.00	A <=	1000	<= 199	1.1
2 =	0.55	B <=	1150	<= 599	2.0
3 =	0.40	C <=	1300	<= 799	3.0
4 =	0.30	D <=	1450	<= 999	4.0
5 =	0.25	E <=	1600	> 1000	5.0
Dbl-Lt =	0.60	F >	1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	625	0.40	250	152	402			NB	0	0.40	0	0	0	
	SB	559	1.00	559	80	639	*		SB	0	1.00	0	0	0	
	EB	360	0.60	216	0	216	*		EB	0	0.60	0	0	0	*
	WB	365	0.60	219	0	219	*		WB	0	0.60	0	0	0	*
Remarks:			* Critical volume		Total	1074		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.67	B						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Arundel Mills Blvd

Conditions: No Build

Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

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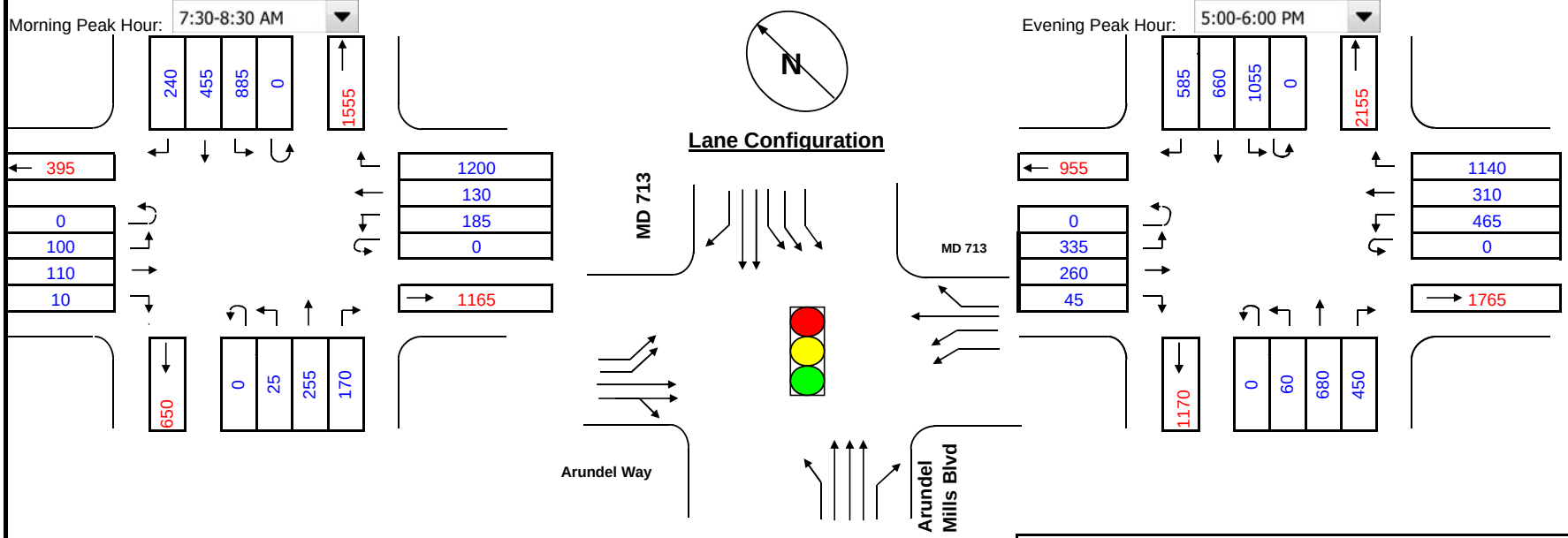

Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	1.00	A	<= 1000	<= 199	1.1
2	0.55	B	<= 1150	<= 599	2.0
3	0.40	C	<= 1300	<= 799	3.0
4	0.30	D	<= 1450	<= 999	4.0
5	0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [ ] Eastbound
- [x] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical ln. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical ln. Volume	*
	NB	255	0.40	102	354	456	*		NB	680	0.40	272	422	694	*
	SB	885	0.40	354	25	379			SB	1055	0.40	422	60	482	
	EB	120	0.55	66	0	66	*		EB	335	0.60	201	0	201	*
	WB	130	1.00	130	0	130	*		WB	310	1.00	310	0	310	*
Remarks:			* Critical volume		Total	**652**		Remarks:			* Critical volume		Total	**1205**	
					Level of service (V/C)	**0.41**	**A**						Level of service (V/C)	**0.75**	**C**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Arundel Mills Blvd

Conditions: No Build

Design Year: 2040

Computed by: JC

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Morning Peak Hour: 1:00-2:00 PM

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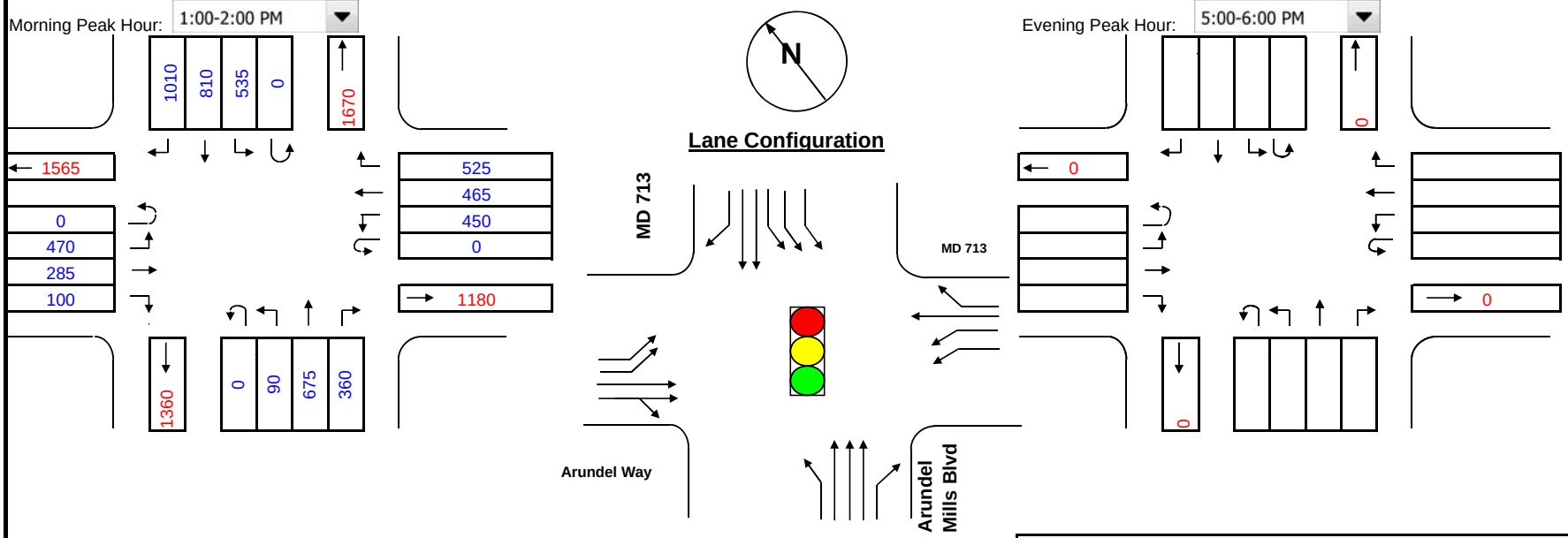


Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1 =	1.00	A <=	1000	<= 199	1.1
2 =	0.55	B <=	1150	<= 599	2.0
3 =	0.40	C <=	1300	<= 799	3.0
4 =	0.30	D <=	1450	<= 999	4.0
5 =	0.25	E <=	1600	> 1000	5.0
Dbl-Lt =	0.60	F >	1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [ ] Eastbound
- [x] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	675	0.40	270	214	484			NB	0	0.40	0	0	0	
	SB	810	0.55	446	90	536	*		SB	0	0.55	0	0	0	
	EB	470	0.60	282	0	282	*		EB	0	0.60	0	0	0	*
	WB	450	0.60	270	0	270	*		WB	0	0.60	0	0	0	*
Remarks:			* Critical volume		Total	1088		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.68	B						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Bass Pro Dr

Conditions: Existing

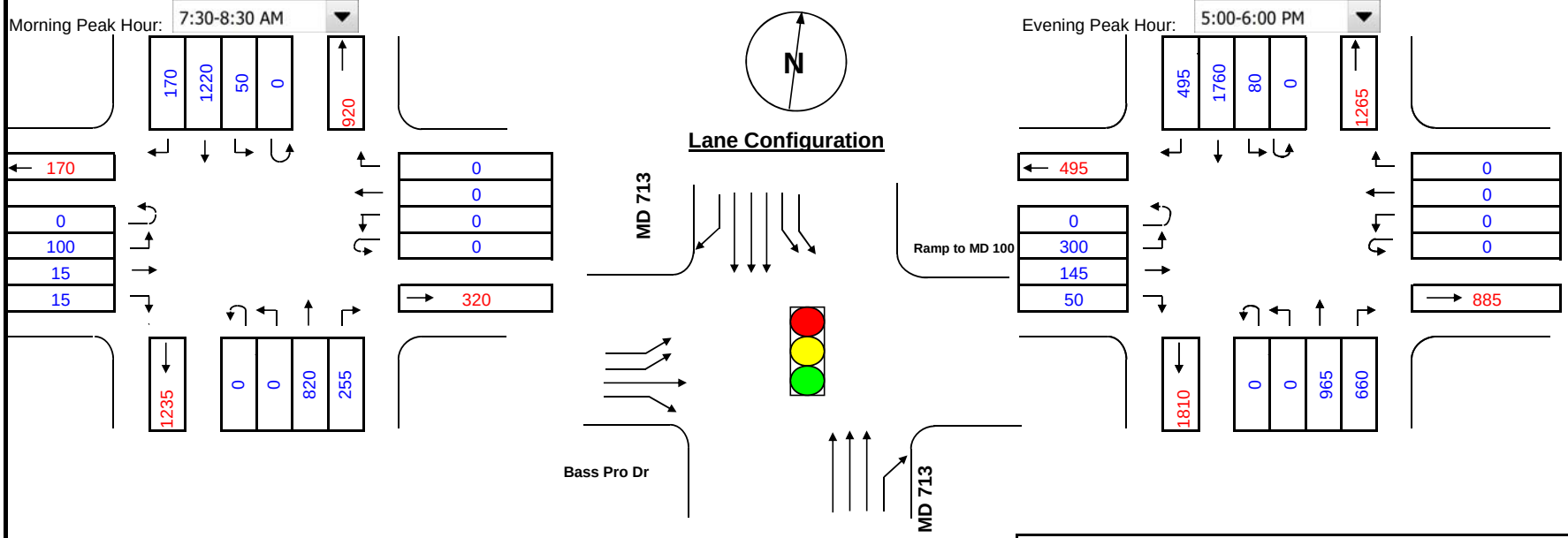
Design Year: 2015

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [ ] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	820	0.40	328	30	358			NB	965	0.40	386	48	434	
	SB	1220	0.40	488	0	488	*		SB	1760	0.40	704	0	704	*
	EB	100	0.60	60	0	60	*		EB	300	0.60	180	0	180	*
	WB	0	0.00	0	0	0			WB	0	0.00	0	0	0	
Remarks:			* Critical volume		Total	548		Remarks:			* Critical volume		Total	884	
					Level of service (V/C)	0.34	A						Level of service (V/C)	0.55	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Bass Pro Dr

Conditions: Existing

Design Year: 2015

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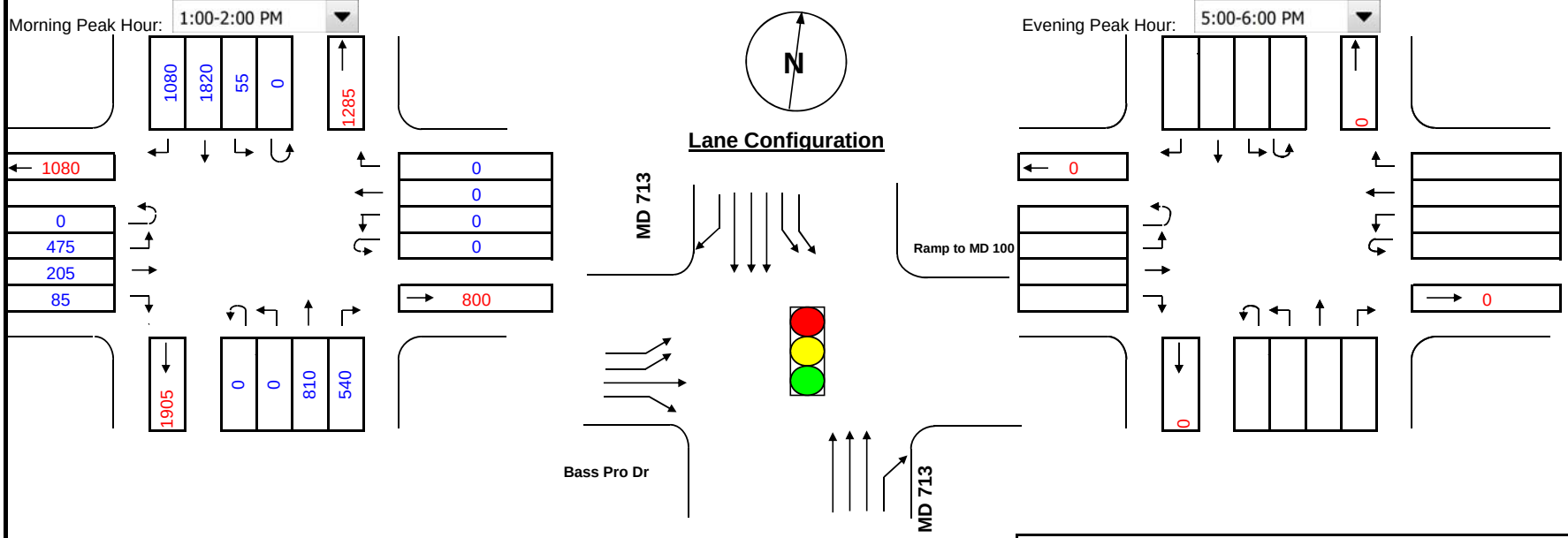
Date 7/26/2016

Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [ ] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	810	0.40	324	33	357			NB	0	1.00	0	0	0	
	SB	1820	0.40	728	0	728	*		SB	0	0.40	0	0	0	
	EB	475	0.60	285	0	285	*		EB	0	0.60	0	0	0	
	WB	0	0.00	0	0	0			WB	0	0.00	0	0	0	
Remarks:			* Critical volume		Total	1013		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.63	B						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Bass Pro Dr

Conditions: No Build

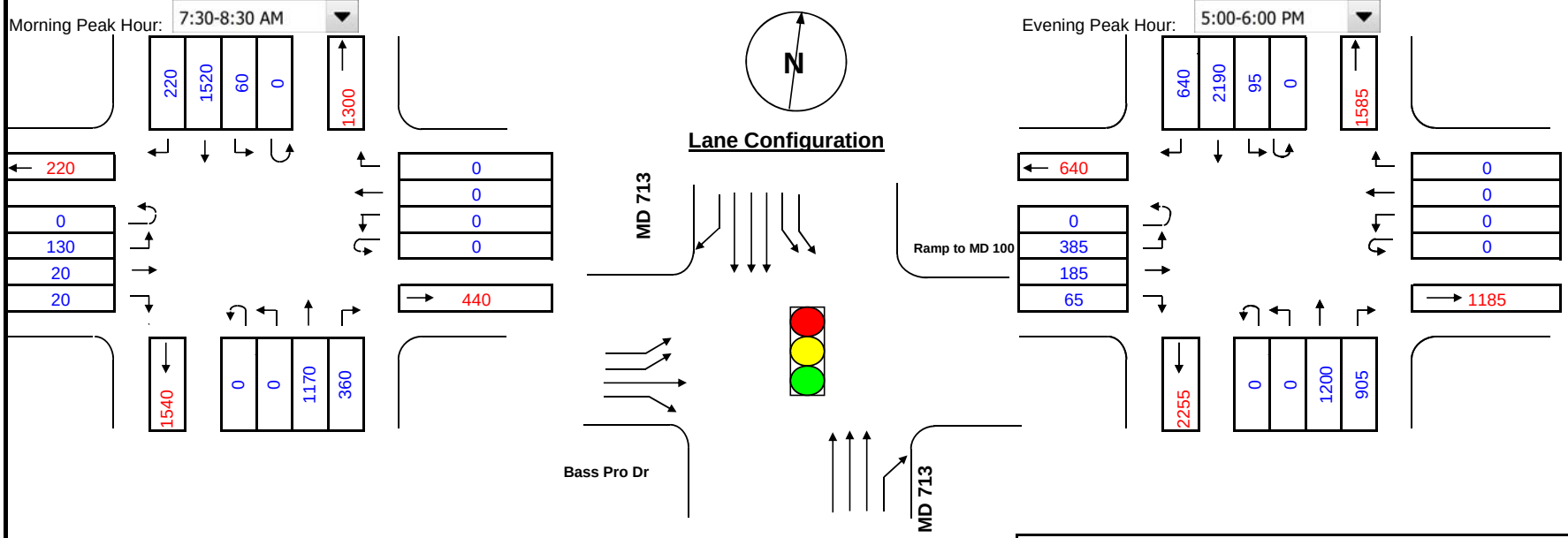
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [ ] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	1170	0.40	468	36	504			NB	1200	0.40	480	57	537	
	SB	1520	0.40	608	0	608	*		SB	2190	0.40	876	0	876	*
	EB	130	0.60	78	0	78	*		EB	385	0.60	231	0	231	*
	WB	0	0.00	0	0	0			WB	0	0.00	0	0	0	
Remarks:			* Critical volume		Total	**686**		Remarks:			* Critical volume		Total	**1107**	
					Level of service (V/C)	**0.43**	**A**						Level of service (V/C)	**0.69**	**B**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Bass Pro Dr

Conditions: No Build

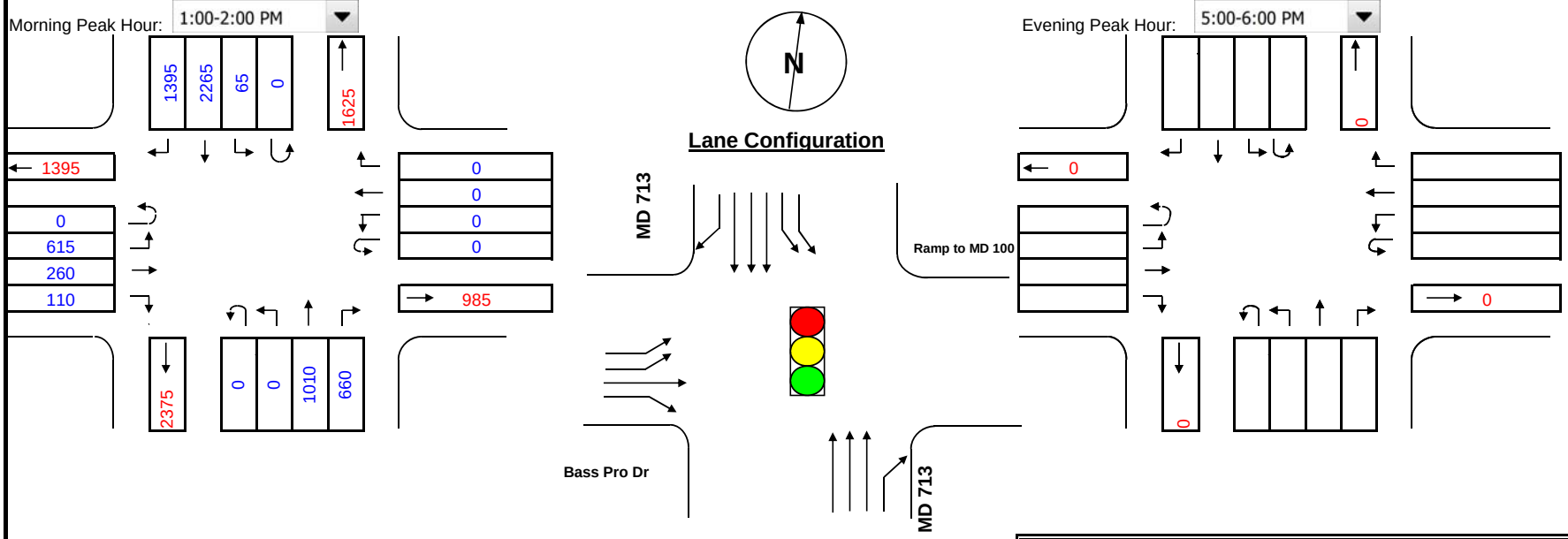
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [ ] Westbound

Split Phasing
- ( ) East/West
- ( ) North/South
- (•) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	1010	0.40	404	39	443			NB	0	1.00	0	0	0	
	SB	2265	0.40	906	0	906	*		SB	0	0.40	0	0	0	
	EB	615	0.60	369	0	369	*		EB	0	0.60	0	0	0	
	WB	0	0.00	0	0	0			WB	0	0.00	0	0	0	

Remarks:

* Critical volume Total **1275**

Level of service (V/C) **0.80** **C**

Remarks:

* Critical volume Total **0**

Level of service (V/C) **0.00** **A**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Ramps to/from MD 100

Conditions: Existing

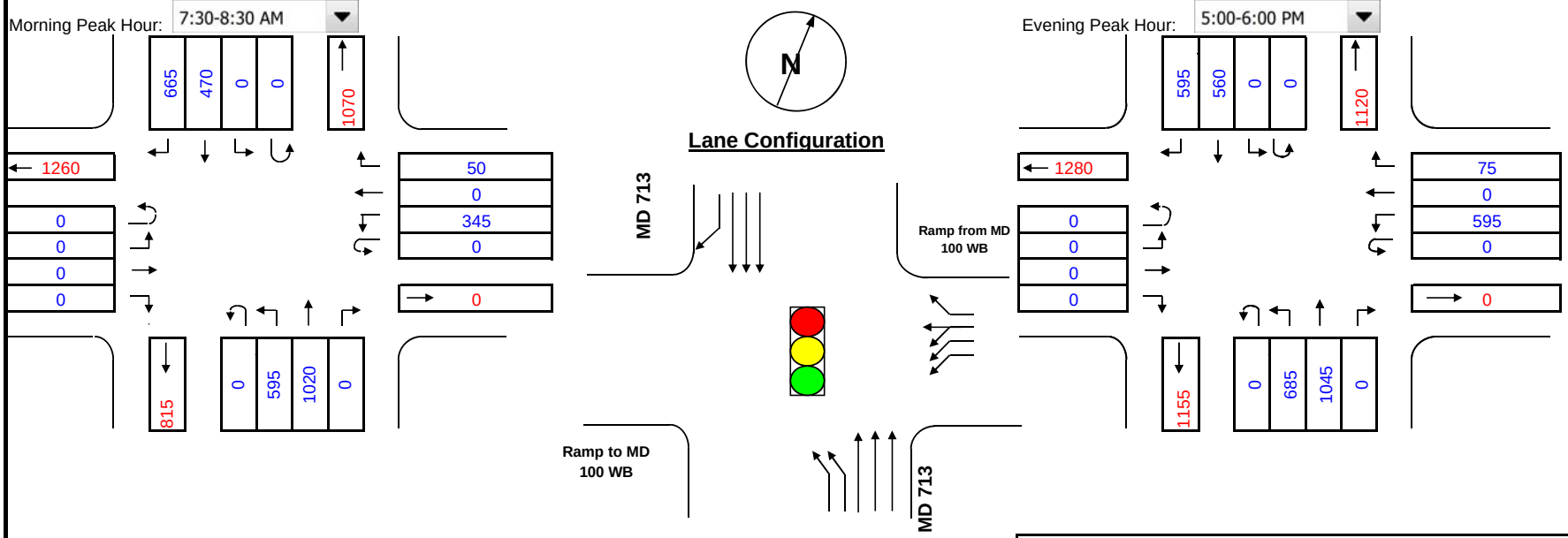
Design Year: 2015

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	1.00	A	<= 1000	<= 199	1.1
2	0.55	B	<= 1150	<= 599	2.0
3	0.40	C	<= 1300	<= 799	3.0
4	0.30	D	<= 1450	<= 999	4.0
5	0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	0.60	F	> 1600		

Phasing

RTOR/Overlap
- ☐ Northbound
- ☑ Southbound
- ☐ Eastbound
- ☑ Westbound

Split Phasing
- ○ East/West
- ○ North/South
- ◉ None

Inx. Control
- ◉ Signal
- ○ Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	1020	0.40	408	0	408			NB	1045	0.40	418	0	418	
	SB	470	0.40	188	357	545	*		SB	560	0.40	224	411	635	*
	EB	0	0.00	0	0	0			EB	0	0.00	0	0	0	
	WB	345	0.40	138	0	138	*		WB	595	0.40	238	0	238	*
Remarks:			* Critical volume		Total	683		Remarks:			* Critical volume		Total	873	
					Level of service (V/C)	0.43	A						Level of service (V/C)	0.55	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Ramps to/from MD 100

Conditions: Existing

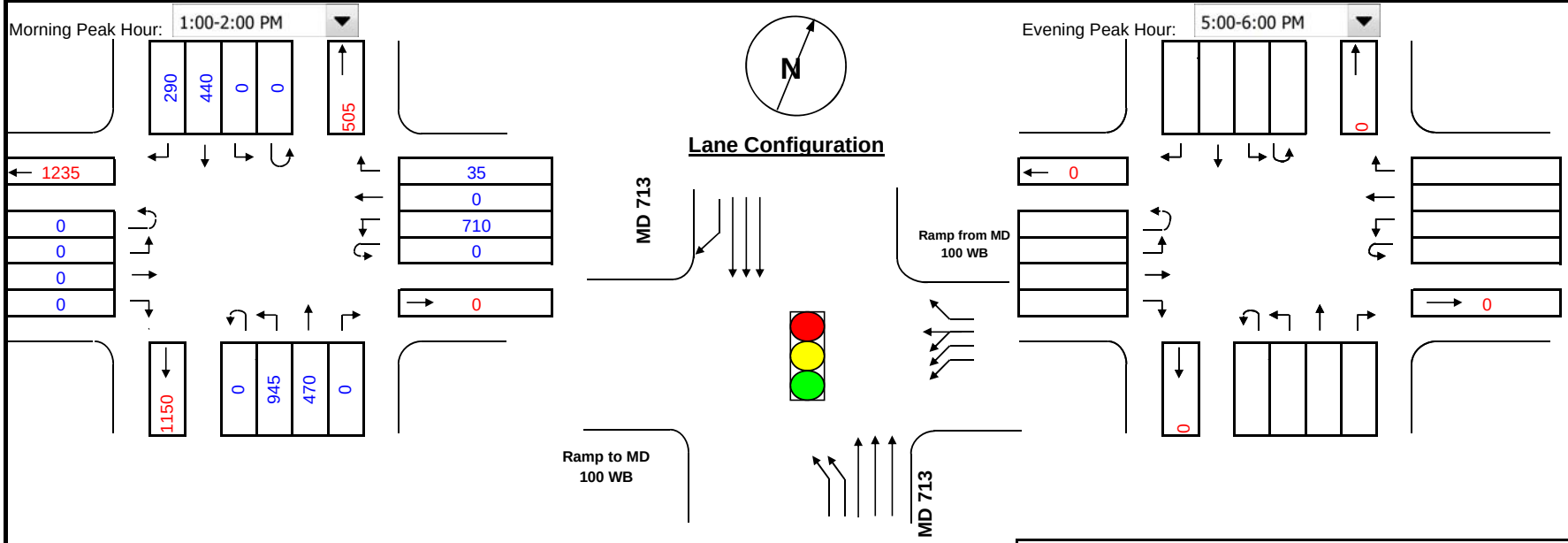
Design Year: 2015

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1 =	1.00	A	<= 1000	<= 199	1.1
2 =	0.55	B	<= 1150	<= 599	2.0
3 =	0.40	C	<= 1300	<= 799	3.0
4 =	0.30	D	<= 1450	<= 999	4.0
5 =	0.25	E	<= 1600	> 1000	5.0
Dbl-Lt =	0.60	F	> 1600		

Phasing

RTOR/Overlap
- ☐ Northbound
- ☑ Southbound
- ☐ Eastbound
- ☑ Westbound

Split Phasing
- ○ East/West
- ○ North/South
- ◉ None

Inx. Control
- ◉ Signal
- ○ Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	470	0.40	188	0	188			NB	0	0.40	0	0	0	
	SB	440	0.40	176	567	743	*		SB	0	0.40	0	0	0	
	EB	0	0.00	0	0	0			EB	0	0.00	0	0	0	
	WB	710	0.40	284	0	284	*		WB	0	0.40	0	0	0	
Remarks:			* Critical volume		Total	1027		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.64	B						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Ramps to/from MD 100

Conditions: No Build

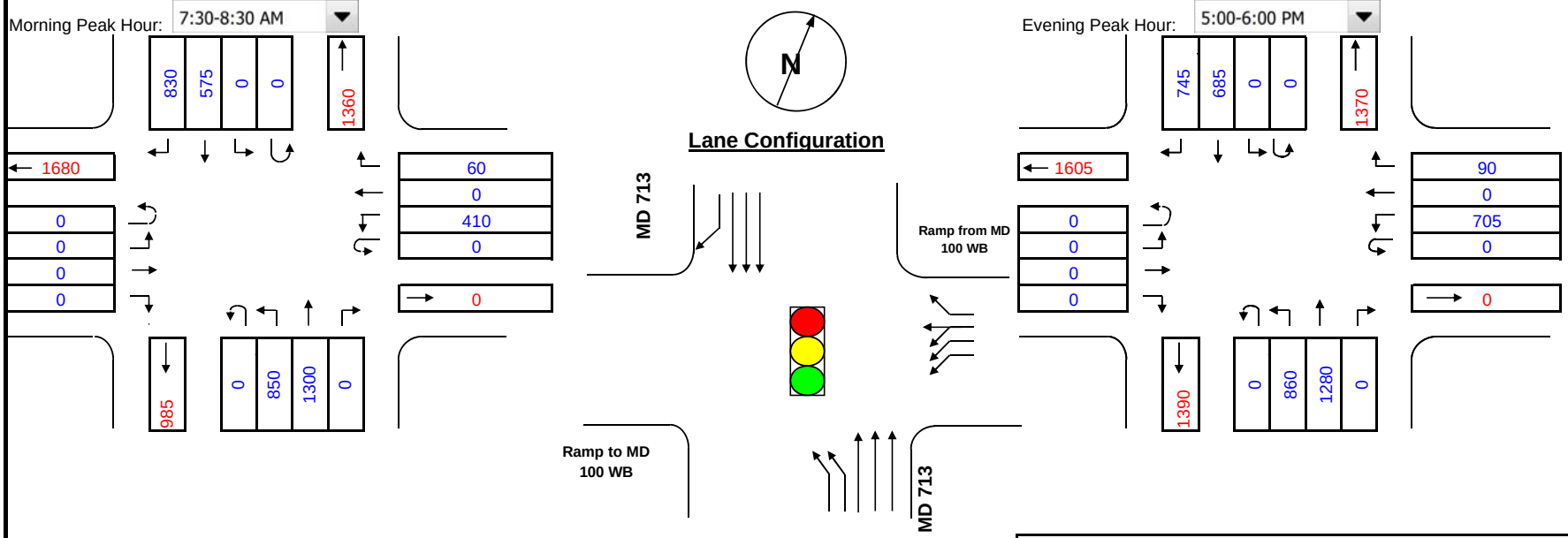
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	1.00	A	<= 1000	<= 199	1.1
2	0.55	B	<= 1150	<= 599	2.0
3	0.40	C	<= 1300	<= 799	3.0
4	0.30	D	<= 1450	<= 999	4.0
5	0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	0.60	F	> 1600		

Phasing

RTOR/Overlap: ☐ Northbound ☑ Southbound ☐ Eastbound ☑ Westbound

Split Phasing: ○ East/West ○ North/South ◉ None

Inx. Control: ◉ Signal ○ Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	1300	0.40	520	0	520			NB	1280	0.40	512	0	512	
	SB	575	0.40	230	510	740	*		SB	685	0.40	274	516	790	*
	EB	0	0.00	0	0	0			EB	0	0.00	0	0	0	
	WB	410	0.40	164	0	164	*		WB	705	0.40	282	0	282	*
Remarks:			* Critical volume		Total	904		Remarks:			* Critical volume		Total	1072	
					Level of service (V/C)	0.57	A						Level of service (V/C)	0.67	B

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at Ramps to/from MD 100

Conditions: No Build

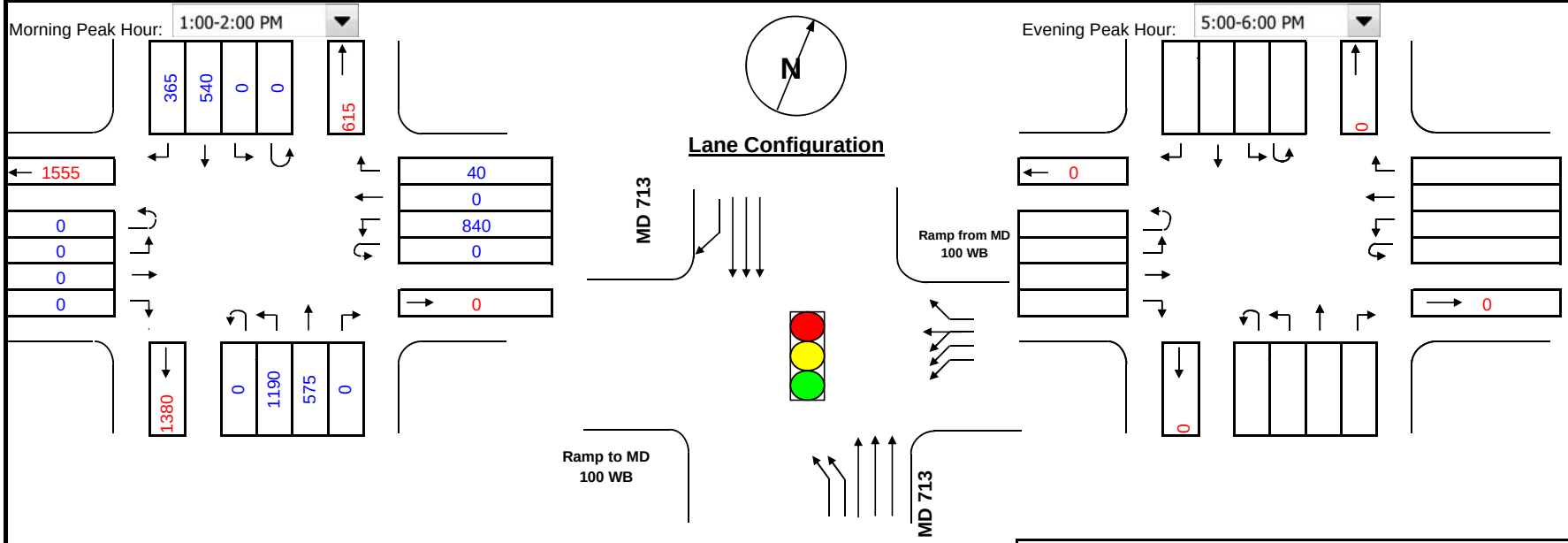
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1 =	1.00	A <=	1000	<= 199	1.1
2 =	0.55	B <=	1150	<= 599	2.0
3 =	0.40	C <=	1300	<= 799	3.0
4 =	0.30	D <=	1450	<= 999	4.0
5 =	0.25	E <=	1600	> 1000	5.0
Dbl-Lt =	0.60	F >	1600		

Phasing

RTOR/Overlap
- ☐ Northbound
- ☑ Southbound
- ☐ Eastbound
- ☑ Westbound

Split Phasing
- ○ East/West
- ○ North/South
- ◉ None

Inx. Control
- ◉ Signal
- ○ Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	575	0.40	230	0	230			NB	0	0.40	0	0	0	
	SB	540	0.40	216	714	930	*		SB	0	0.40	0	0	0	
	EB	0	0.00	0	0	0			EB	0	0.00	0	0	0	
	WB	840	0.40	336	0	336	*		WB	0	0.40	0	0	0	
Remarks:			* Critical volume		Total	1266		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.79	C						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at MD 176

Conditions: Existing

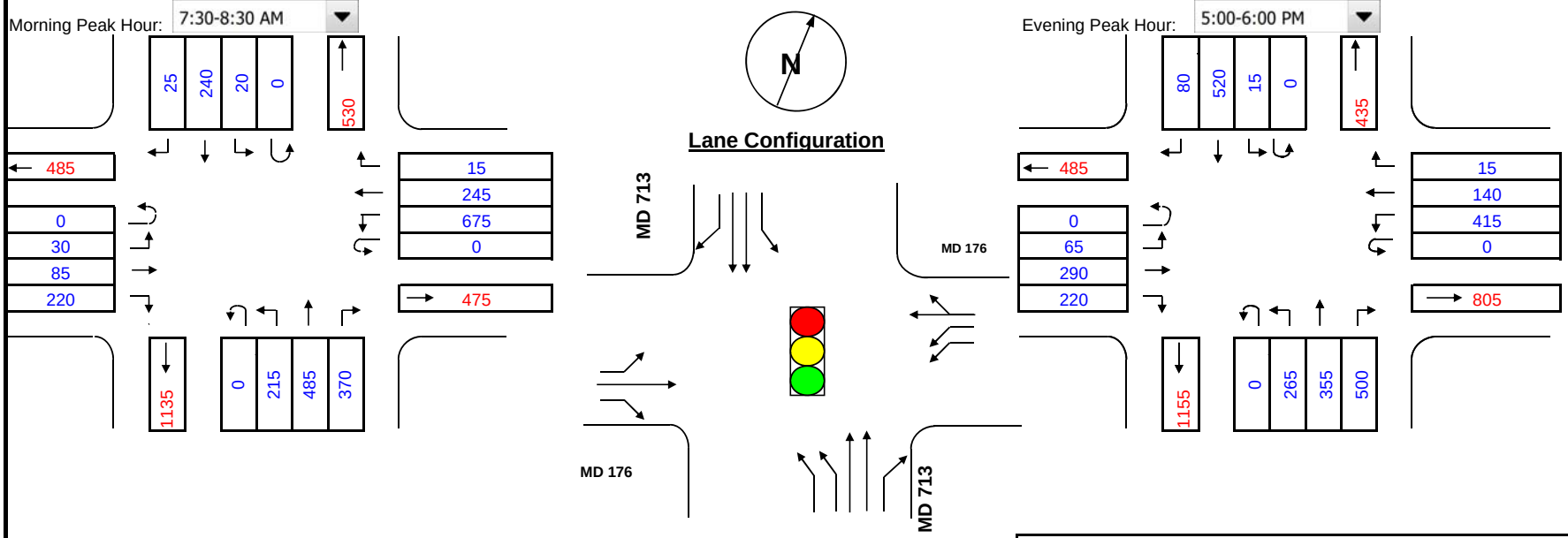
Design Year: 2015

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [ ] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical ln. volume	*
	NB	485	0.55	267	20	287	*
	SB	240	0.55	132	129	261	
	EB	85	1.00	85	0	85	*
	WB	675	0.60	405	0	405	*

Remarks:

* Critical volume Total **777**

Level of service (V/C) **0.49** **A**

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical ln. Volume	*
	NB	251	1.00	251	15	266	
	SB	520	0.55	286	159	445	*
	EB	290	1.00	290	0	290	*
	WB	415	0.60	249	0	249	*

Remarks:

* Critical volume Total **984**

Level of service (V/C) **0.62** **A**

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at MD 176

Conditions: Existing

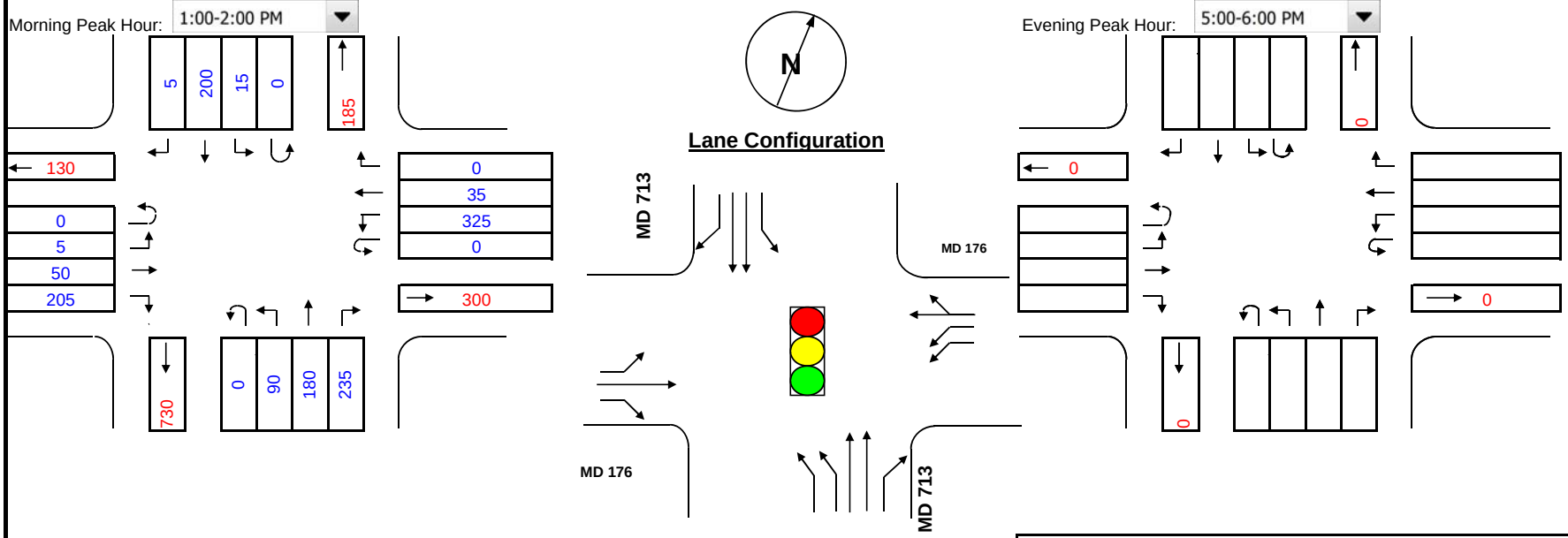
Design Year: 2015

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	180	0.55	99	15	114			NB	0	1.00	0	0	0	
	SB	200	0.55	110	54	164	*		SB	0	0.55	0	0	0	
	EB	50	1.00	50	0	50	*		EB	0	1.00	0	0	0	*
	WB	325	0.60	195	0	195	*		WB	0	0.60	0	0	0	*
Remarks:			* Critical volume		Total	409		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.26	A						Level of service (V/C)	0.00	A

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at MD 176

Conditions: No Build

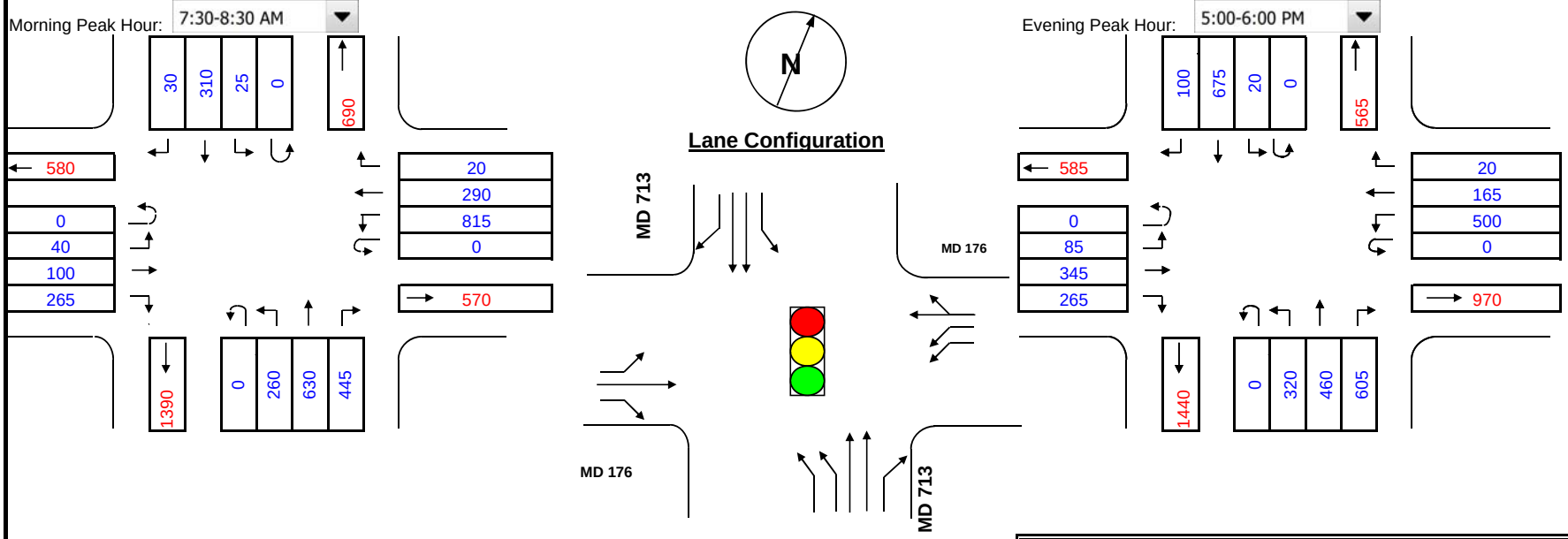
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 7:30-8:30 AM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [ ] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	630	0.55	347	25	372	*		NB	305	1.00	305	20	325	
	SB	310	0.55	171	156	327			SB	675	0.55	371	192	563	*
	EB	100	1.00	100	0	100	*		EB	345	1.00	345	0	345	*
	WB	815	0.60	489	0	489	*		WB	500	0.60	300	0	300	*
Remarks:			* Critical volume		Total	961		Remarks:			* Critical volume		Total	1208	
					Level of service (V/C)	0.60	A						Level of service (V/C)	0.76	C

Maryland State Highway Administration
Turning Movement Summary and Level of Service

Prepared by: **Sabra, Wang & Associates, Inc.**

Count Date:

Location: MD 713 at MD 176

Conditions: No Build

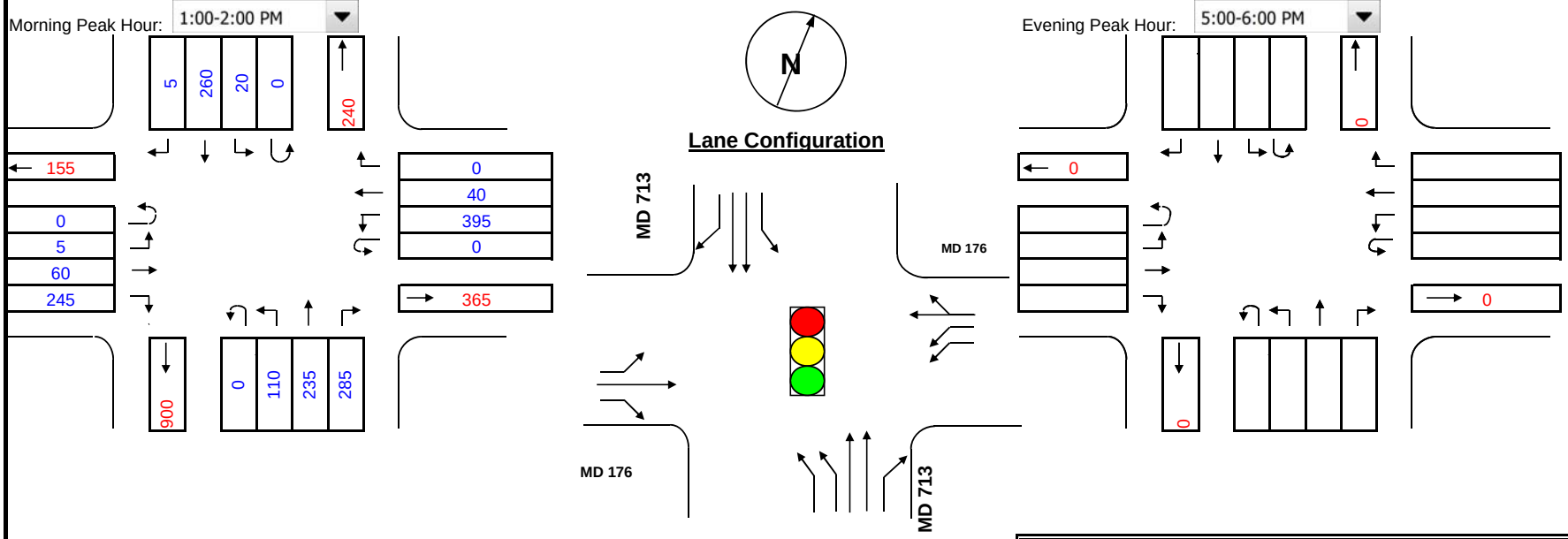
Design Year: 2040

Computed by: JC

Date 7/26/2016

Morning Peak Hour: 1:00-2:00 PM

Evening Peak Hour: 5:00-6:00 PM



Number of Lanes	Lane Use Factor	Service Level	Critical Lane Vol	Opposing Volume (VPH)	PCE
1	= 1.00	A	<= 1000	<= 199	1.1
2	= 0.55	B	<= 1150	<= 599	2.0
3	= 0.40	C	<= 1300	<= 799	3.0
4	= 0.30	D	<= 1450	<= 999	4.0
5	= 0.25	E	<= 1600	> 1000	5.0
Dbl-Lt	= 0.60	F	> 1600		

Phasing

RTOR/Overlap
- [x] Northbound
- [x] Southbound
- [x] Eastbound
- [x] Westbound

Split Phasing
- (•) East/West
- ( ) North/South
- ( ) None

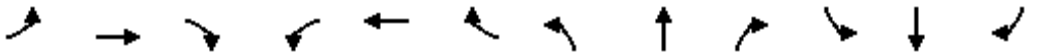
Inx. Control
- (•) Signal
- ( ) Stop

Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. volume	*	Phase	Movement	Volume 1	Lane Use Factor - 2	Lane volume 1 X 2	Opposing Movement	Critical In. Volume	*
	NB	235	0.55	129	20	149			NB	0	1.00	0	0	0	
	SB	260	0.55	143	66	209	*		SB	0	0.55	0	0	0	
	EB	60	1.00	60	0	60	*		EB	0	1.00	0	0	0	*
	WB	395	0.60	237	0	237	*		WB	0	0.60	0	0	0	*
Remarks:			* Critical volume		Total	506		Remarks:			* Critical volume		Total	0	
					Level of service (V/C)	0.32	A						Level of service (V/C)	0.00	A

Appendix C:

Existing, 2040 No build, and Recommended Design HCM Reports

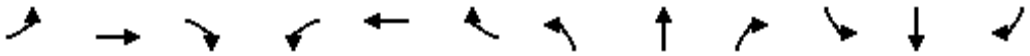
Existing Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	565	325	125	1010	125	170	60	40	205	300	490
Future Volume (vph)	115	565	325	125	1010	125	170	60	40	205	300	490
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0	4.0	5.5	5.5	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.91	0.91	1.00	0.91	0.86	0.91
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1610	3293	1583	1610	2995	1441
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1610	3293	1583	1610	2995	1441
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	614	353	136	1098	136	185	65	43	223	326	533
RTOR Reduction (vph)	0	0	174	0	0	52	0	0	39	0	68	34
Lane Group Flow (vph)	125	614	179	136	1098	84	92	158	4	201	536	243
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	pm+ov
Protected Phases	1	6		5	2		3	3		4	4	1
Permitted Phases			6			2			3			4
Actuated Green, G (s)	10.8	76.2	76.2	11.3	76.7	76.7	12.3	12.3	12.3	31.2	31.2	42.0
Effective Green, g (s)	10.8	76.2	76.2	11.3	76.7	76.7	12.3	12.3	12.3	31.2	31.2	42.0
Actuated g/C Ratio	0.07	0.51	0.51	0.08	0.51	0.51	0.08	0.08	0.08	0.21	0.21	0.28
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0	4.0	5.5	5.5	4.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	247	1797	804	258	1809	809	132	270	129	334	622	403
v/s Ratio Prot	0.04	0.17		0.04	c0.31		c0.06	0.05		0.12	c0.18	c0.04
v/s Ratio Perm			0.11			0.05			0.00			0.13
v/c Ratio	0.51	0.34	0.22	0.53	0.61	0.10	0.70	0.59	0.03	0.60	0.86	0.60
Uniform Delay, d1	67.0	22.0	20.5	66.8	26.0	18.9	67.0	66.4	63.3	53.8	57.3	46.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.5	0.6	1.9	1.5	0.3	14.8	3.2	0.1	3.0	11.8	2.5
Delay (s)	68.7	22.5	21.1	68.7	27.5	19.2	81.9	69.6	63.4	56.8	69.1	49.3
Level of Service	E	C	C	E	C	B	F	E	E	E	E	D
Approach Delay (s)		27.3			30.8			72.5			61.7	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

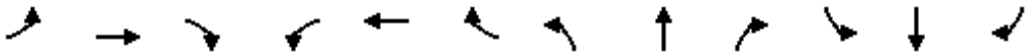
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	20	45	0	35	5	285	10	10	930	5
Future Volume (Veh/h)	0	0	20	45	0	35	5	285	10	10	930	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	0	23	52	0	40	6	328	11	11	1069	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1474	1445	1072	1460	1442	334	1075			339		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1474	1445	1072	1460	1442	334	1075			339		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	91	46	100	94	99			99		
cM capacity (veh/h)	97	129	268	97	130	708	649			1220		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	23	92	6	339	11	1075
Volume Left	0	52	6	0	11	0
Volume Right	23	40	0	11	0	6
cSH	268	155	649	1700	1220	1700
Volume to Capacity	0.09	0.59	0.01	0.20	0.01	0.63
Queue Length 95th (ft)	7	79	1	0	1	0
Control Delay (s)	19.7	57.7	10.6	0.0	8.0	0.0
Lane LOS	C	F	B		A	
Approach Delay (s)	19.7	57.7	0.2		0.1	
Approach LOS	C	F				

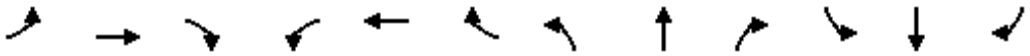
Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	67.2%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	5	5	335	5	395	5	295	55	95	605	5
Future Volume (vph)	15	5	5	335	5	395	5	295	55	95	605	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1760			1775	1583	1770	1863	1583	1770	1861	
Flt Permitted		0.71			0.71	1.00	0.30	1.00	1.00	0.46	1.00	
Satd. Flow (perm)		1282			1323	1583	553	1863	1583	850	1861	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	16	5	5	356	5	420	5	314	59	101	644	5
RTOR Reduction (vph)	0	4	0	0	0	308	0	0	32	0	0	0
Lane Group Flow (vph)	0	22	0	0	361	112	5	314	27	101	649	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8	6		6	2		
Actuated Green, G (s)		24.1			24.1	24.1	44.0	42.1	42.1	55.0	48.1	
Effective Green, g (s)		24.1			24.1	24.1	44.0	42.1	42.1	55.0	48.1	
Actuated g/C Ratio		0.26			0.26	0.26	0.48	0.46	0.46	0.60	0.53	
Clearance Time (s)		6.0			6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	4.0	6.0	6.0	4.0	6.0	
Lane Grp Cap (vph)		339			349	418	292	860	731	592	982	
v/s Ratio Prot							0.00	0.17		c0.01	c0.35	
v/s Ratio Perm		0.02			c0.27	0.07	0.01		0.02	0.09		
v/c Ratio		0.07			1.03	0.27	0.02	0.37	0.04	0.17	0.66	
Uniform Delay, d1		25.1			33.5	26.5	13.0	15.9	13.4	8.1	15.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1			57.3	0.3	0.0	1.2	0.1	0.2	3.5	
Delay (s)		25.2			90.8	26.9	13.1	17.1	13.5	8.3	19.1	
Level of Service		C			F	C	B	B	B	A	B	
Approach Delay (s)		25.2			56.4			16.4			17.6	
Approach LOS		C			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	91.1	Sum of lost time (s)	17.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

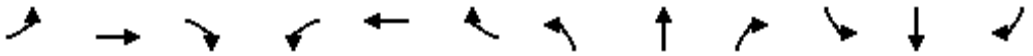
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	0	20	30	0	10	20	635	50	10	655	10
Future Volume (vph)	35	0	20	30	0	10	20	635	50	10	655	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0			8.0		5.0	10.0	10.0	5.0	10.0	
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.95			0.97		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97			0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1717			1734		1770	1863	1583	1770	1858	
Flt Permitted		0.78			0.85		0.27	1.00	1.00	0.31	1.00	
Satd. Flow (perm)		1383			1530		499	1863	1583	576	1858	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	0	21	32	0	11	21	668	53	11	689	11
RTOR Reduction (vph)	0	55	0	0	41	0	0	0	23	0	0	0
Lane Group Flow (vph)	0	3	0	0	2	0	21	668	30	11	700	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			3		1	6		5	2	
Permitted Phases	4			3			6		6	2		
Actuated Green, G (s)		5.9			4.1		58.7	56.5	56.5	56.5	55.4	
Effective Green, g (s)		5.9			4.1		58.7	56.5	56.5	56.5	55.4	
Actuated g/C Ratio		0.06			0.04		0.60	0.57	0.57	0.57	0.56	
Clearance Time (s)		8.0			8.0		5.0	10.0	10.0	5.0	10.0	
Vehicle Extension (s)		5.0			5.0		3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)		82			63		325	1067	907	343	1043	
v/s Ratio Prot							c0.00	0.36		0.00	c0.38	
v/s Ratio Perm		c0.00			c0.00		0.04		0.02	0.02		
v/c Ratio		0.04			0.03		0.06	0.63	0.03	0.03	0.67	
Uniform Delay, d1		43.7			45.3		10.0	14.0	9.2	10.0	15.2	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4			0.4		0.1	2.8	0.1	0.0	3.4	
Delay (s)		44.1			45.7		10.1	16.8	9.2	10.1	18.6	
Level of Service		D			D		B	B	A	B	B	
Approach Delay (s)		44.1			45.7			16.1			18.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	98.6	Sum of lost time (s)	31.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

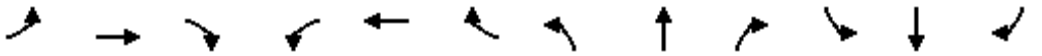
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	25	35	150	30	270	95	700	85	340	410	75
Future Volume (vph)	35	25	35	150	30	270	95	700	85	340	410	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		2.0	2.0	4.0	4.0	6.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91	1.00	0.97	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1810	1583		1788	1583	1770	5085	1583	3433	3457	
Flt Permitted		0.67	1.00		0.72	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1255	1583		1342	1583	1770	5085	1583	3433	3457	
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)	38	27	38	163	33	293	103	761	92	370	446	82
RTOR Reduction (vph)	0	0	29	0	0	221	0	0	49	0	10	0
Lane Group Flow (vph)	0	65	9	0	196	72	103	761	43	370	518	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8			6			
Actuated Green, G (s)		24.0	24.0		26.0	26.0	12.0	54.1	54.1	19.4	61.5	
Effective Green, g (s)		26.0	26.0		28.0	28.0	13.0	56.1	54.1	20.4	63.5	
Actuated g/C Ratio		0.23	0.23		0.24	0.24	0.11	0.49	0.47	0.18	0.55	
Clearance Time (s)		6.0	6.0		4.0	4.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)		284	359		328	387	200	2491	747	611	1917	
v/s Ratio Prot							0.06	c0.15		c0.11	0.15	
v/s Ratio Perm		0.05	0.01		c0.15	0.05			0.03			
v/c Ratio		0.23	0.02		0.60	0.19	0.52	0.31	0.06	0.61	0.27	
Uniform Delay, d1		36.1	34.4		38.3	34.2	47.8	17.5	16.4	43.3	13.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4	0.0		2.9	0.2	2.2	0.3	0.1	2.5	0.3	
Delay (s)		36.5	34.4		41.2	34.5	50.0	17.8	16.5	45.8	13.7	
Level of Service		D	C		D	C	D	B	B	D	B	
Approach Delay (s)		35.7			37.2			21.2			26.9	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	114.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

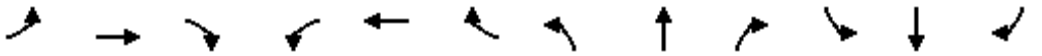
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	55	10	150	90	765	20	235	140	630	420	185
Future Volume (vph)	75	55	10	150	90	765	20	235	140	630	420	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5
Lane Util. Factor	0.97	0.95		0.97	1.00	1.00	1.00	0.91	1.00	0.94	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3455		3433	1863	1583	1770	5085	1583	4990	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3455		3433	1863	1583	1770	5085	1583	4990	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	58	11	158	95	805	21	247	147	663	442	195
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	95	0	0	96
Lane Group Flow (vph)	79	59	0	158	95	805	21	247	52	663	442	99
Turn Type	Split	NA		Split	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases						Free			6			2
Actuated Green, G (s)	8.2	8.2		9.7	9.7	85.7	2.8	28.4	28.4	16.4	42.0	42.0
Effective Green, g (s)	10.2	10.2		11.7	11.7	85.7	3.8	30.4	30.4	17.4	43.5	43.5
Actuated g/C Ratio	0.12	0.12		0.14	0.14	1.00	0.04	0.35	0.35	0.20	0.51	0.51
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	408	411		468	254	1583	78	1803	561	1013	1796	803
v/s Ratio Prot	0.02	0.02		0.05	0.05		0.01	0.05		c0.13	0.12	
v/s Ratio Perm						c0.51			0.03			0.06
v/c Ratio	0.19	0.14		0.34	0.37	0.51	0.27	0.14	0.09	0.65	0.25	0.12
Uniform Delay, d1	34.0	33.8		33.5	33.7	0.0	39.6	18.8	18.5	31.4	11.9	11.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1		0.3	0.7	1.2	1.9	0.2	0.3	1.5	0.3	0.3
Delay (s)	34.2	34.0		33.8	34.3	1.2	41.5	18.9	18.8	32.9	12.2	11.4
Level of Service	C	C		C	C	A	D	B	B	C	B	B
Approach Delay (s)		34.1			9.0			20.0			22.6	
Approach LOS		C			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	85.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

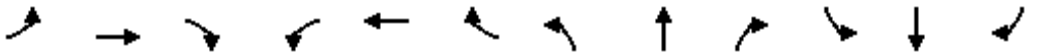
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	15	15	0	0	0	0	820	255	50	1220	170
Future Volume (vph)	100	15	15	0	0	0	0	820	255	50	1220	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5					4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00					0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583					5085	1583	3433	5085	1583
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583					5085	1583	3433	5085	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92	0.92
Adj. Flow (vph)	105	16	16	0	0	0	0	863	277	54	1326	185
RTOR Reduction (vph)	0	0	14	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	105	16	2	0	0	0	0	863	277	54	1326	185
Turn Type	Perm	NA	Perm					NA	Free	Prot	NA	Free
Protected Phases		4						6		5	2	
Permitted Phases	4		4						Free			Free
Actuated Green, G (s)	9.0	9.0	9.0					78.6	111.7	5.6	90.2	111.7
Effective Green, g (s)	11.0	11.0	11.0					80.6	111.7	6.6	92.2	111.7
Actuated g/C Ratio	0.10	0.10	0.10					0.72	1.00	0.06	0.83	1.00
Clearance Time (s)	6.5	6.5	6.5					6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					5.0		2.5	5.0	
Lane Grp Cap (vph)	338	183	155					3669	1583	202	4197	1583
v/s Ratio Prot		0.01						0.17		0.02	c0.26	
v/s Ratio Perm	c0.03		0.00						0.17			0.12
v/c Ratio	0.31	0.09	0.01					0.24	0.17	0.27	0.32	0.12
Uniform Delay, d1	46.8	45.8	45.4					5.2	0.0	50.2	2.3	0.0
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.0					0.2	0.2	0.5	0.2	0.2
Delay (s)	47.4	46.0	45.5					5.4	0.2	50.8	2.5	0.2
Level of Service	D	D	D					A	A	D	A	A
Approach Delay (s)		47.0			0.0			4.1			3.9	
Approach LOS		D			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	111.7	Sum of lost time (s)	13.5
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		

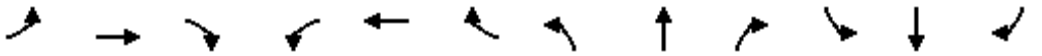
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	345	0	50	595	1020	0	0	470	665
Future Volume (vph)	0	0	0	345	0	50	595	1020	0	0	470	665
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	3.5			4.0	4.0
Lane Util. Factor				0.91	0.91	1.00	0.97	0.91			0.91	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3221	1610	1583	3433	5085			5085	1583
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				3221	1610	1583	3433	5085			5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	383	0	56	661	1133	0	0	522	739
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	257	126	56	661	1133	0	0	522	739
Turn Type				custom	NA	Free	Prot	NA			NA	Free
Protected Phases				4			1	6			2	
Permitted Phases				4		Free						Free
Actuated Green, G (s)				11.6	11.6	69.1	19.3	46.0			20.2	69.1
Effective Green, g (s)				13.6	11.6	69.1	21.3	48.0			22.2	69.1
Actuated g/C Ratio				0.20	0.17	1.00	0.31	0.69			0.32	1.00
Clearance Time (s)				6.0			6.0	5.5			6.0	
Vehicle Extension (s)				3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)				633	270	1583	1058	3532			1633	1583
v/s Ratio Prot				0.08	0.08		c0.19	0.22			0.10	
v/s Ratio Perm						0.04						c0.47
v/c Ratio				0.41	0.47	0.04	0.62	0.32			0.32	0.47
Uniform Delay, d1				24.2	26.0	0.0	20.5	4.1			17.7	0.0
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				0.4	1.3	0.0	1.2	0.1			0.1	1.0
Delay (s)				24.7	27.2	0.0	21.6	4.2			17.9	1.0
Level of Service				C	C	A	C	A			B	A
Approach Delay (s)		0.0			22.3			10.6			8.0	
Approach LOS		A			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	69.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		

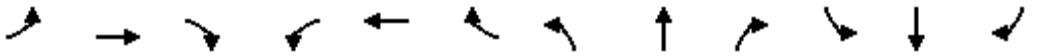
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	85	220	675	245	15	215	485	370	20	240	25
Future Volume (vph)	30	85	220	675	245	15	215	485	370	20	240	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0	6.0	5.0	4.0		4.0	4.0	5.0	4.0	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1847		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	3433	1847		3433	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	32	90	234	718	261	16	229	516	394	21	255	27
RTOR Reduction (vph)	0	0	208	0	1	0	0	0	137	0	0	21
Lane Group Flow (vph)	32	90	26	718	276	0	229	516	257	21	255	6
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6	3	5	2	
Permitted Phases			4						6			2
Actuated Green, G (s)	10.8	10.8	10.8	28.5	28.5		12.2	33.3	61.8	2.9	23.5	23.5
Effective Green, g (s)	11.8	12.8	10.8	29.5	30.5		13.2	34.8	63.8	3.9	25.0	23.5
Actuated g/C Ratio	0.12	0.13	0.11	0.30	0.31		0.13	0.36	0.65	0.04	0.26	0.24
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		5.0	5.5	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	213	243	174	1033	574		462	1256	1030	70	902	379
v/s Ratio Prot	0.02	c0.05		c0.21	0.15		c0.07	c0.15	0.07	0.01	0.07	
v/s Ratio Perm			0.02						0.09			0.00
v/c Ratio	0.15	0.37	0.15	0.70	0.48		0.50	0.41	0.25	0.30	0.28	0.02
Uniform Delay, d1	38.6	38.9	39.4	30.3	27.3		39.3	23.9	7.1	45.7	29.3	28.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	1.0	0.4	2.1	0.6		0.8	0.2	0.1	2.4	0.2	0.0
Delay (s)	38.9	39.9	39.8	32.3	28.0		40.2	24.1	7.2	48.1	29.5	28.5
Level of Service	D	D	D	C	C		D	C	A	D	C	C
Approach Delay (s)		39.8			31.1			21.5			30.7	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

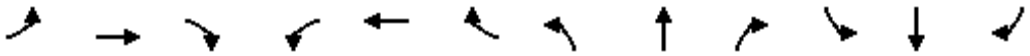
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	545	1120	100	80	750	285	275	280	130	270	95	210
Future Volume (vph)	545	1120	100	80	750	285	275	280	130	270	95	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0	4.0	5.5	5.5	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.91	0.91	1.00	0.91	0.86	0.91
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99	1.00	0.95	0.98	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1610	3348	1583	1610	3015	1441
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99	1.00	0.95	0.98	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1610	3348	1583	1610	3015	1441
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	574	1179	105	84	789	300	289	295	137	284	100	221
RTOR Reduction (vph)	0	0	36	0	0	168	0	0	116	0	21	49
Lane Group Flow (vph)	574	1179	69	84	789	132	191	393	21	156	289	90
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	pm+ov
Protected Phases	1	6		5	2		3	3		4	4	1
Permitted Phases			6			2			3			4
Actuated Green, G (s)	29.8	78.3	78.3	9.1	57.6	57.6	22.7	22.7	22.7	20.9	20.9	50.7
Effective Green, g (s)	29.8	78.3	78.3	9.1	57.6	57.6	22.7	22.7	22.7	20.9	20.9	50.7
Actuated g/C Ratio	0.20	0.52	0.52	0.06	0.38	0.38	0.15	0.15	0.15	0.14	0.14	0.34
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0	4.0	5.5	5.5	4.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	5.0	5.0	3.0
Lane Grp Cap (vph)	682	1847	826	208	1358	607	243	506	239	224	420	487
v/s Ratio Prot	c0.17	c0.33		0.02	0.22		c0.12	0.12		c0.10	0.10	0.04
v/s Ratio Perm			0.04			0.08			0.01			0.03
v/c Ratio	0.84	0.64	0.08	0.40	0.58	0.22	0.79	0.78	0.09	0.70	0.69	0.18
Uniform Delay, d1	57.8	25.7	17.9	67.8	36.6	31.0	61.3	61.2	54.7	61.5	61.5	35.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.2	1.7	0.2	1.3	1.8	0.8	15.3	7.4	0.2	11.4	6.0	0.2
Delay (s)	67.1	27.4	18.1	69.1	38.5	31.9	76.6	68.6	54.9	72.9	67.4	35.2
Level of Service	E	C	B	E	D	C	E	E	D	E	E	D
Approach Delay (s)		39.1			39.0			68.1			61.4	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	47.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		

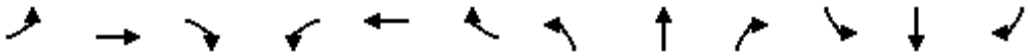
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	10	20	0	20	25	965	120	40	545	15
Future Volume (Veh/h)	5	0	10	20	0	20	25	965	120	40	545	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	5	0	10	20	0	20	25	975	121	40	551	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1684	1784	558	1726	1732	1036	566			1096		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1684	1784	558	1726	1732	1036	566			1096		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	98	69	100	93	98			94		
cM capacity (veh/h)	65	75	529	64	80	281	1006			637		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	15	40	25	1096	40	566
Volume Left	5	20	25	0	40	0
Volume Right	10	20	0	121	0	15
cSH	156	104	1006	1700	637	1700
Volume to Capacity	0.10	0.38	0.02	0.64	0.06	0.33
Queue Length 95th (ft)	8	39	2	0	5	0
Control Delay (s)	30.5	59.7	8.7	0.0	11.0	0.0
Lane LOS	D	F	A		B	
Approach Delay (s)	30.5	59.7	0.2		0.7	
Approach LOS	D	F				

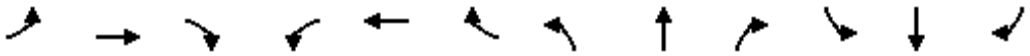
Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	68.4%	ICU Level of Service		C
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	5	0	100	5	340	5	680	365	415	680	20
Future Volume (vph)	15	5	0	100	5	340	5	680	365	415	680	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.96			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1794			1778	1583	1770	1863	1583	1770	1855	
Flt Permitted		0.75			0.72	1.00	0.39	1.00	1.00	0.14	1.00	
Satd. Flow (perm)		1398			1342	1583	723	1863	1583	256	1855	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	16	5	0	104	5	354	5	708	380	432	708	21
RTOR Reduction (vph)	0	0	0	0	0	305	0	0	204	0	1	0
Lane Group Flow (vph)	0	21	0	0	109	49	5	708	176	432	728	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8	6		6	2		
Actuated Green, G (s)		13.0			13.0	13.0	45.1	43.2	43.2	68.3	61.4	
Effective Green, g (s)		13.0			13.0	13.0	45.1	43.2	43.2	68.3	61.4	
Actuated g/C Ratio		0.14			0.14	0.14	0.48	0.46	0.46	0.73	0.66	
Clearance Time (s)		6.0			6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	4.0	6.0	6.0	4.0	6.0	
Lane Grp Cap (vph)		194			186	220	370	862	732	513	1220	
v/s Ratio Prot							0.00	0.38		c0.18	0.39	
v/s Ratio Perm		0.02			c0.08	0.03	0.01		0.11	c0.43		
v/c Ratio		0.11			0.59	0.22	0.01	0.82	0.24	0.84	0.60	
Uniform Delay, d1		35.1			37.6	35.7	12.5	21.7	15.1	22.0	9.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2			4.7	0.5	0.0	8.7	0.8	12.4	2.2	
Delay (s)		35.3			42.3	36.2	12.5	30.4	15.9	34.3	11.1	
Level of Service		D			D	D	B	C	B	C	B	
Approach Delay (s)		35.3			37.6			25.3			19.8	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	93.3	Sum of lost time (s)	17.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		

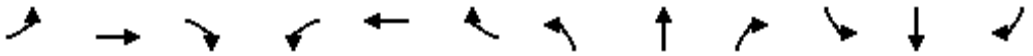
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	5	10	100	0	20	45	945	45	50	1005	50
Future Volume (vph)	15	5	10	100	0	20	45	945	45	50	1005	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0			8.0		5.0	10.0	10.0	5.0	10.0	
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.95			0.98		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98			0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1733			1748		1770	1863	1583	1770	1849	
Flt Permitted		0.78			0.57		0.08	1.00	1.00	0.07	1.00	
Satd. Flow (perm)		1381			1029		142	1863	1583	138	1849	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	5	11	105	0	21	47	995	47	53	1058	53
RTOR Reduction (vph)	0	10	0	0	115	0	0	0	23	0	1	0
Lane Group Flow (vph)	0	22	0	0	11	0	47	995	24	53	1110	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			3		1	6		5	2	
Permitted Phases	4			3			6		6	2		
Actuated Green, G (s)		5.5			9.4		56.3	52.4	52.4	59.3	53.9	
Effective Green, g (s)		5.5			9.4		56.3	52.4	52.4	59.3	53.9	
Actuated g/C Ratio		0.05			0.09		0.54	0.51	0.51	0.57	0.52	
Clearance Time (s)		8.0			8.0		5.0	10.0	10.0	5.0	10.0	
Vehicle Extension (s)		5.0			5.0		3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)		73			93		138	941	799	163	961	
v/s Ratio Prot							0.01	0.53		c0.02	c0.60	
v/s Ratio Perm		c0.02			c0.01		0.17		0.01	0.17		
v/c Ratio		0.30			0.12		0.34	1.06	0.03	0.33	1.16	
Uniform Delay, d1		47.2			43.4		22.7	25.7	12.9	22.2	24.9	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		4.7			1.2		1.5	45.7	0.1	1.2	81.7	
Delay (s)		51.9			44.6		24.2	71.4	13.0	23.3	106.6	
Level of Service		D			D		C	E	B	C	F	
Approach Delay (s)		51.9			44.6			66.8			102.8	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	82.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	103.7	Sum of lost time (s)	31.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

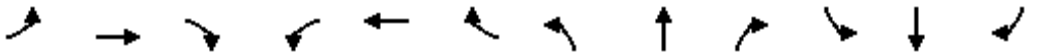
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	50	90	285	45	450	105	775	245	360	805	130
Future Volume (vph)	110	50	90	285	45	450	105	775	245	360	805	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0	6.0	3.0	4.0	4.0	3.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91	1.00	0.97	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1801	1583		1786	1583	1770	5085	1583	3433	3465	
Flt Permitted		0.27	1.00		0.53	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		507	1583		988	1583	1770	5085	1583	3433	3465	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	116	53	95	300	47	474	111	816	258	379	847	137
RTOR Reduction (vph)	0	0	71	0	0	355	0	0	180	0	8	0
Lane Group Flow (vph)	0	169	24	0	347	119	111	816	78	379	976	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8			6			
Actuated Green, G (s)		34.0	34.0		34.0	34.0	13.8	39.0	39.0	45.0	70.2	
Effective Green, g (s)		36.0	34.0		36.0	34.0	15.8	41.0	41.0	47.0	72.2	
Actuated g/C Ratio		0.27	0.25		0.27	0.25	0.12	0.30	0.30	0.35	0.53	
Clearance Time (s)		6.0	6.0		6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)		135	398		263	398	207	1544	480	1195	1853	
v/s Ratio Prot							c0.06	0.16		0.11	c0.28	
v/s Ratio Perm		0.33	0.02		c0.35	0.08			0.05			
v/c Ratio		1.25	0.06		1.32	0.30	0.54	0.53	0.16	0.32	0.53	
Uniform Delay, d1		49.5	38.4		49.5	40.9	56.1	39.0	34.4	32.2	20.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.41	1.28	
Incremental Delay, d2		160.2	0.3		167.9	1.9	2.7	1.3	0.7	0.6	1.0	
Delay (s)		209.7	38.7		217.4	42.8	58.8	40.3	35.2	13.7	26.9	
Level of Service		F	D		F	D	E	D	D	B	C	
Approach Delay (s)		148.2			116.6			40.9			23.2	
Approach LOS		F			F			D			C	

Intersection Summary			
HCM 2000 Control Delay	59.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

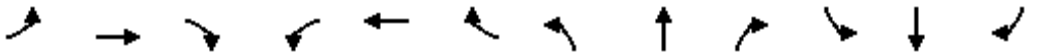
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	255	180	40	380	215	740	55	630	365	750	610	450
Future Volume (vph)	255	180	40	380	215	740	55	630	365	750	610	450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5
Lane Util. Factor	0.97	0.95		0.97	1.00	1.00	1.00	0.91	1.00	0.94	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3443		3433	1863	1583	1770	5085	1583	4990	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3443		3433	1863	1583	1770	5085	1583	4990	3539	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	263	186	41	392	222	763	57	649	376	773	629	464
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	239	0	0	223
Lane Group Flow (vph)	263	212	0	392	222	763	57	649	137	773	629	241
Turn Type	Split	NA		Split	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases						Free			6			2
Actuated Green, G (s)	15.2	15.2		19.6	19.6	135.0	8.5	47.2	47.2	30.0	68.7	68.7
Effective Green, g (s)	17.2	17.2		21.6	21.6	135.0	9.5	49.2	49.2	31.0	70.2	70.2
Actuated g/C Ratio	0.13	0.13		0.16	0.16	1.00	0.07	0.36	0.36	0.23	0.52	0.52
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	437	438		549	298	1583	124	1853	576	1145	1840	823
v/s Ratio Prot	c0.08	0.06		0.11	c0.12		0.03	0.13		c0.15	0.18	
v/s Ratio Perm						c0.48			0.09			0.15
v/c Ratio	0.60	0.48		0.71	0.74	0.48	0.46	0.35	0.24	0.68	0.34	0.29
Uniform Delay, d1	55.7	54.8		53.8	54.1	0.0	60.3	31.3	29.9	47.4	18.9	18.3
Progression Factor	1.00	1.00		0.69	0.70	1.00	1.00	1.00	1.00	1.38	0.35	0.15
Incremental Delay, d2	2.0	0.6		3.2	7.3	0.8	2.7	0.5	1.0	1.9	0.5	0.8
Delay (s)	57.6	55.4		40.3	44.9	0.8	63.0	31.8	30.8	67.1	7.1	3.6
Level of Service	E	E		D	D	A	E	C	C	E	A	A
Approach Delay (s)		56.6			19.2			33.1			31.1	
Approach LOS		E			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

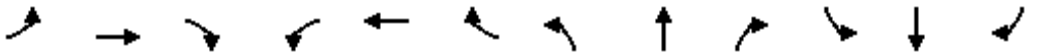
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	300	145	50	0	0	0	0	965	660	80	1760	495
Future Volume (vph)	300	145	50	0	0	0	0	965	660	80	1760	495
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5					4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00					0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583					5085	1583	3433	5085	1583
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583					5085	1583	3433	5085	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	153	53	0	0	0	0	1016	695	84	1853	521
RTOR Reduction (vph)	0	0	45	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	316	153	8	0	0	0	0	1016	695	84	1853	521
Turn Type	Perm	NA	Perm					NA	Free	Prot	NA	Free
Protected Phases		4						6		5	2	
Permitted Phases	4		4						Free			Free
Actuated Green, G (s)	17.9	17.9	17.9					90.4	135.0	8.2	104.6	135.0
Effective Green, g (s)	19.9	19.9	19.9					92.4	135.0	9.2	106.6	135.0
Actuated g/C Ratio	0.15	0.15	0.15					0.68	1.00	0.07	0.79	1.00
Clearance Time (s)	6.5	6.5	6.5					6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					5.0		2.5	5.0	
Lane Grp Cap (vph)	506	274	233					3480	1583	233	4015	1583
v/s Ratio Prot		0.08						0.20		0.02	c0.36	
v/s Ratio Perm	c0.09		0.00						c0.44			0.33
v/c Ratio	0.62	0.56	0.03					0.29	0.44	0.36	0.46	0.33
Uniform Delay, d1	54.0	53.5	49.3					8.4	0.0	60.1	4.7	0.0
Progression Factor	1.00	1.00	1.00					1.09	1.00	1.37	0.34	1.00
Incremental Delay, d2	2.4	2.5	0.1					0.2	0.8	0.7	0.4	0.6
Delay (s)	56.4	55.9	49.4					9.4	0.8	82.7	2.0	0.6
Level of Service	E	E	D					A	A	F	A	A
Approach Delay (s)		55.6			0.0			5.9			4.4	
Approach LOS		E			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

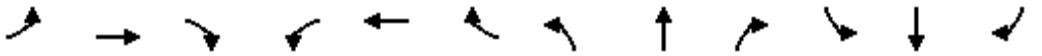
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	595	0	75	685	1045	0	0	560	595
Future Volume (vph)	0	0	0	595	0	75	685	1045	0	0	560	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	3.5			4.0	4.0
Lane Util. Factor				0.91	0.91	1.00	0.97	0.91			0.91	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3221	1610	1583	3433	5085			5085	1583
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				3221	1610	1583	3433	5085			5085	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	633	0	80	729	1112	0	0	596	633
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	424	209	80	729	1112	0	0	596	633
Turn Type				custom	NA	Free	Prot	NA			NA	Free
Protected Phases				4			1	6			2	
Permitted Phases				4		Free						Free
Actuated Green, G (s)				23.1	23.1	135.0	72.6	100.4			21.3	135.0
Effective Green, g (s)				25.1	23.1	135.0	74.6	102.4			23.3	135.0
Actuated g/C Ratio				0.19	0.17	1.00	0.55	0.76			0.17	1.00
Clearance Time (s)				6.0			6.0	5.5			6.0	
Vehicle Extension (s)				3.0			3.5	5.0			5.0	
Lane Grp Cap (vph)				598	275	1583	1897	3857			877	1583
v/s Ratio Prot				c0.13	0.13		0.21	0.22			c0.12	
v/s Ratio Perm						0.05						c0.40
v/c Ratio				0.71	0.76	0.05	0.38	0.29			0.68	0.40
Uniform Delay, d1				51.5	53.3	0.0	17.2	5.0			52.4	0.0
Progression Factor				1.00	1.00	1.00	1.18	1.22			1.00	1.00
Incremental Delay, d2				3.8	11.7	0.1	0.6	0.1			2.8	0.8
Delay (s)				55.4	65.0	0.1	20.8	6.3			55.1	0.8
Level of Service				E	E	A	C	A			E	A
Approach Delay (s)		0.0			52.0			12.0			27.1	
Approach LOS		A			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

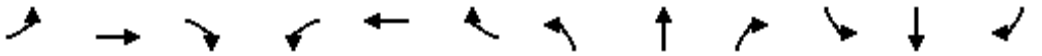
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	290	220	415	140	15	265	355	500	15	520	80
Future Volume (vph)	65	290	220	415	140	15	265	355	500	15	520	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0	6.0	5.0	4.0		4.0	4.5	5.0	4.0	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1835		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	3433	1835		3433	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	73	326	247	466	157	17	298	399	562	17	584	90
RTOR Reduction (vph)	0	0	200	0	3	0	0	0	165	0	0	63
Lane Group Flow (vph)	73	326	47	466	171	0	298	399	397	17	584	27
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6	3	5	2	
Permitted Phases			4						6			2
Actuated Green, G (s)	23.0	23.0	23.0	24.4	24.4		13.9	46.3	70.7	3.0	35.4	35.4
Effective Green, g (s)	24.0	25.0	23.0	25.4	26.4		14.9	47.8	72.7	4.0	36.9	35.4
Actuated g/C Ratio	0.20	0.21	0.19	0.21	0.22		0.12	0.40	0.61	0.03	0.31	0.30
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.5	3.5		3.0	5.0	3.5	3.0	5.0	5.0
Lane Grp Cap (vph)	354	389	304	728	404		427	1413	1027	59	1090	468
v/s Ratio Prot	0.04	c0.18		c0.14	0.09		c0.09	0.11	0.08	0.01	c0.17	
v/s Ratio Perm			0.03						0.17			0.02
v/c Ratio	0.21	0.84	0.16	0.64	0.42		0.70	0.28	0.39	0.29	0.54	0.06
Uniform Delay, d1	39.9	45.4	40.3	43.0	40.1		50.2	24.3	12.1	56.5	34.3	30.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	14.5	0.2	2.0	0.8		4.9	0.5	0.3	2.7	1.9	0.2
Delay (s)	40.2	59.9	40.5	45.0	40.9		55.2	24.8	12.3	59.2	36.2	30.4
Level of Service	D	E	D	D	D		E	C	B	E	D	C
Approach Delay (s)		50.3			43.9			26.4			36.0	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	36.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	119.7	Sum of lost time (s)	18.5
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

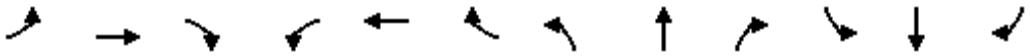
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	275	615	80	45	695	245	80	60	40	225	100	215
Future Volume (vph)	275	615	80	45	695	245	80	60	40	225	100	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0	4.0	5.5	5.5	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.91	0.91	1.00	0.91	0.86	0.91
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00	0.95	0.98	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1610	3330	1583	1610	3000	1441
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00	0.95	0.98	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1610	3330	1583	1610	3000	1441
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	284	634	82	46	716	253	82	62	41	232	103	222
RTOR Reduction (vph)	0	0	30	0	0	110	0	0	39	0	35	97
Lane Group Flow (vph)	284	634	52	46	716	143	47	97	2	144	249	32
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	pm+ov
Protected Phases	1	6		5	2		3	3		4	4	1
Permitted Phases			6			2			3			4
Actuated Green, G (s)	17.7	95.9	95.9	6.3	84.5	84.5	8.8	8.8	8.8	20.0	20.0	37.7
Effective Green, g (s)	17.7	95.9	95.9	6.3	84.5	84.5	8.8	8.8	8.8	20.0	20.0	37.7
Actuated g/C Ratio	0.12	0.64	0.64	0.04	0.56	0.56	0.06	0.06	0.06	0.13	0.13	0.25
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0	4.0	5.5	5.5	4.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	5.0	5.0	3.0
Lane Grp Cap (vph)	405	2262	1012	144	1993	891	94	195	92	214	400	362
v/s Ratio Prot	c0.08	0.18		0.01	c0.20		c0.03	0.03		c0.09	0.08	0.01
v/s Ratio Perm			0.03			0.09			0.00			0.01
v/c Ratio	0.70	0.28	0.05	0.32	0.36	0.16	0.50	0.50	0.03	0.67	0.62	0.09
Uniform Delay, d1	63.6	11.9	10.1	69.8	17.9	15.7	68.5	68.5	66.6	61.9	61.4	43.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4	0.3	0.1	1.3	0.5	0.4	4.1	2.0	0.1	10.4	4.2	0.1
Delay (s)	69.0	12.2	10.2	71.1	18.4	16.1	72.6	70.4	66.7	72.3	65.7	43.1
Level of Service	E	B	B	E	B	B	E	E	E	E	E	D
Approach Delay (s)		28.2			20.2			70.2			62.2	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

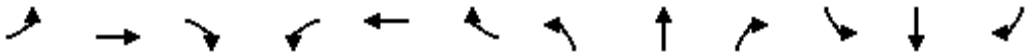
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	10	25	0	20	15	520	35	15	505	5
Future Volume (Veh/h)	5	0	10	25	0	20	15	520	35	15	505	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	0	10	26	0	21	16	542	36	16	526	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1156	1170	528	1160	1155	560	531			578		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1156	1170	528	1160	1155	560	531			578		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	98	84	100	96	98			98		
cM capacity (veh/h)	163	187	550	165	191	528	1036			996		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	15	47	16	578	16	531
Volume Left	5	26	16	0	16	0
Volume Right	10	21	0	36	0	5
cSH	307	239	1036	1700	996	1700
Volume to Capacity	0.05	0.20	0.02	0.34	0.02	0.31
Queue Length 95th (ft)	4	18	1	0	1	0
Control Delay (s)	17.3	23.8	8.5	0.0	8.7	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	17.3	23.8	0.2		0.3	
Approach LOS	C	C				

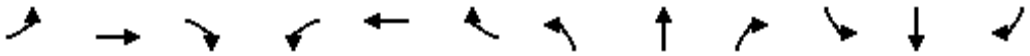
Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	40.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	5	0	100	0	340	5	430	115	250	425	10
Future Volume (vph)	10	5	0	100	0	340	5	430	115	250	425	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1801			1770	1583	1770	1863	1583	1770	1856	
Flt Permitted		0.78			0.75	1.00	0.49	1.00	1.00	0.36	1.00	
Satd. Flow (perm)		1459			1392	1583	921	1863	1583	661	1856	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	11	5	0	108	0	366	5	462	124	269	457	11
RTOR Reduction (vph)	0	0	0	0	0	314	0	0	62	0	0	0
Lane Group Flow (vph)	0	16	0	0	108	52	5	462	62	269	468	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8	6		6	2		
Actuated Green, G (s)		12.3			12.3	12.3	45.2	43.4	43.4	62.1	55.3	
Effective Green, g (s)		12.3			12.3	12.3	45.2	43.4	43.4	62.1	55.3	
Actuated g/C Ratio		0.14			0.14	0.14	0.52	0.50	0.50	0.72	0.64	
Clearance Time (s)		6.0			6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	4.0	6.0	6.0	4.0	6.0	
Lane Grp Cap (vph)		207			198	225	499	935	795	650	1187	
v/s Ratio Prot							0.00	c0.25		c0.07	0.25	
v/s Ratio Perm		0.01			c0.08	0.03	0.01		0.04	0.23		
v/c Ratio		0.08			0.55	0.23	0.01	0.49	0.08	0.41	0.39	
Uniform Delay, d1		32.1			34.5	32.9	9.9	14.2	11.1	5.6	7.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2			3.1	0.5	0.0	1.9	0.2	0.6	1.0	
Delay (s)		32.3			37.5	33.4	9.9	16.1	11.3	6.2	8.5	
Level of Service		C			D	C	A	B	B	A	A	
Approach Delay (s)		32.3			34.3			15.0			7.6	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	86.4	Sum of lost time (s)	17.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

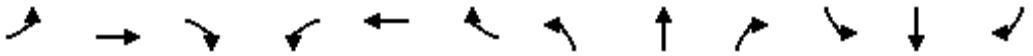
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	0	10	15	0	15	5	755	20	30	660	10
Future Volume (vph)	30	0	10	15	0	15	5	755	20	30	660	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0			8.0		5.0	10.0	10.0	5.0	10.0	
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.97			0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.96			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1736			1695		1770	1863	1583	1770	1859	
Flt Permitted		0.90			0.89		0.32	1.00	1.00	0.22	1.00	
Satd. Flow (perm)		1622			1552		590	1863	1583	409	1859	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	31	0	10	15	0	15	5	778	21	31	680	10
RTOR Reduction (vph)	0	39	0	0	29	0	0	0	9	0	0	0
Lane Group Flow (vph)	0	2	0	0	1	0	5	778	12	31	690	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			3		1	6		5	2	
Permitted Phases	4			3			6		6	2		
Actuated Green, G (s)		3.9			3.9		58.8	57.8	57.8	63.6	60.2	
Effective Green, g (s)		3.9			3.9		58.8	57.8	57.8	63.6	60.2	
Actuated g/C Ratio		0.04			0.04		0.59	0.58	0.58	0.64	0.60	
Clearance Time (s)		8.0			8.0		5.0	10.0	10.0	5.0	10.0	
Vehicle Extension (s)		5.0			5.0		3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)		63			60		358	1076	914	306	1119	
v/s Ratio Prot							0.00	c0.42		c0.00	0.37	
v/s Ratio Perm		c0.00			c0.00		0.01		0.01	0.06		
v/c Ratio		0.03			0.02		0.01	0.72	0.01	0.10	0.62	
Uniform Delay, d1		46.2			46.2		9.3	15.3	9.0	9.9	12.6	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.3			0.3		0.0	4.2	0.0	0.1	2.5	
Delay (s)		46.6			46.5		9.3	19.5	9.0	10.0	15.1	
Level of Service		D			D		A	B	A	B	B	
Approach Delay (s)		46.6			46.5			19.2			14.9	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

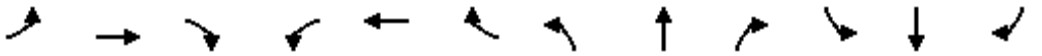
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	55	165	110	45	150	130	765	65	145	560	165
Future Volume (vph)	65	55	165	110	45	150	130	765	65	145	560	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0	6.0	3.0	4.0	4.0	3.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91	1.00	0.97	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1814	1583		1799	1583	1770	5085	1583	3433	3418	
Flt Permitted		0.70	1.00		0.63	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1301	1583		1183	1583	1770	5085	1583	3433	3418	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	69	59	176	117	48	160	138	814	69	154	596	176
RTOR Reduction (vph)	0	0	130	0	0	118	0	0	41	0	15	0
Lane Group Flow (vph)	0	128	46	0	165	42	138	814	28	154	757	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8			6			
Actuated Green, G (s)		39.0	39.0		39.0	39.0	17.0	59.0	59.0	35.0	77.0	
Effective Green, g (s)		41.0	39.0		41.0	39.0	19.0	61.0	61.0	37.0	79.0	
Actuated g/C Ratio		0.27	0.26		0.27	0.26	0.13	0.41	0.41	0.25	0.53	
Clearance Time (s)		6.0	6.0		6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)		355	411		323	411	224	2067	643	846	1800	
v/s Ratio Prot							c0.08	0.16		0.04	c0.22	
v/s Ratio Perm		0.10	0.03		c0.14	0.03			0.02			
v/c Ratio		0.36	0.11		0.51	0.10	0.62	0.39	0.04	0.18	0.42	
Uniform Delay, d1		43.9	42.3		46.0	42.2	62.0	31.4	26.9	44.6	21.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.57	1.79	
Incremental Delay, d2		2.8	0.5		5.7	0.5	5.0	0.6	0.1	0.4	0.7	
Delay (s)		46.8	42.8		51.7	42.7	67.0	32.0	27.0	25.9	39.3	
Level of Service		D	D		D	D	E	C	C	C	D	
Approach Delay (s)		44.5			47.3			36.4			37.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		

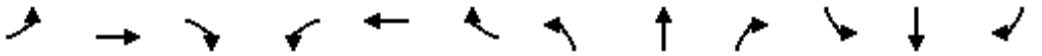
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	195	90	365	250	365	80	625	295	380	750	775
Future Volume (vph)	360	195	90	365	250	365	80	625	295	380	750	775
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5
Lane Util. Factor	0.97	0.95		0.97	1.00	1.00	1.00	0.91	1.00	0.94	0.95	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3371		3433	1863	1583	1770	5085	1583	4990	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3371		3433	1863	1583	1770	5085	1583	4990	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	379	205	95	384	263	384	84	658	311	400	789	816
RTOR Reduction (vph)	0	40	0	0	0	0	0	0	179	0	0	346
Lane Group Flow (vph)	379	260	0	384	263	384	84	658	132	400	789	470
Turn Type	Split	NA		Split	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases						Free			6			2
Actuated Green, G (s)	21.8	21.8		26.0	26.0	150.0	12.4	61.9	61.9	17.3	66.8	66.8
Effective Green, g (s)	23.8	23.8		28.0	28.0	150.0	13.4	63.9	63.9	18.3	68.3	68.3
Actuated g/C Ratio	0.16	0.16		0.19	0.19	1.00	0.09	0.43	0.43	0.12	0.46	0.46
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	544	534		640	347	1583	158	2166	674	608	1611	720
v/s Ratio Prot	c0.11	0.08		0.11	c0.14		0.05	0.13		c0.08	0.22	
v/s Ratio Perm						0.24			0.08			c0.30
v/c Ratio	0.70	0.49		0.60	0.76	0.24	0.53	0.30	0.20	0.66	0.49	0.65
Uniform Delay, d1	59.7	57.5		55.9	57.8	0.0	65.3	28.4	27.0	62.9	28.6	31.6
Progression Factor	1.00	1.00		0.62	0.63	1.00	1.00	1.00	1.00	0.88	1.67	4.12
Incremental Delay, d2	3.6	0.5		1.2	8.3	0.3	3.4	0.4	0.7	2.3	1.0	4.1
Delay (s)	63.3	58.0		35.8	44.9	0.3	68.7	28.7	27.6	57.7	48.9	134.3
Level of Service	E	E		D	D	A	E	C	C	E	D	F
Approach Delay (s)		60.9			24.9			31.6			85.4	
Approach LOS		E			C			C			F	

Intersection Summary			
HCM 2000 Control Delay	57.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		

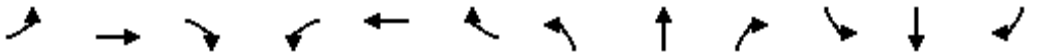
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	475	205	85	0	0	0	0	810	540	55	1820	1080
Future Volume (vph)	475	205	85	0	0	0	0	810	540	55	1820	1080
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5					4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00					0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583					5085	1583	3433	5085	1583
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583					5085	1583	3433	5085	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	490	211	88	0	0	0	0	835	557	57	1876	1113
RTOR Reduction (vph)	0	0	52	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	490	211	36	0	0	0	0	835	557	57	1876	1113
Turn Type	Perm	NA	Perm					NA	Free	Prot	NA	Free
Protected Phases		4						6		5	2	
Permitted Phases	4		4						Free			Free
Actuated Green, G (s)	27.9	27.9	27.9					97.3	150.0	6.3	109.6	150.0
Effective Green, g (s)	29.9	29.9	29.9					99.3	150.0	7.3	111.6	150.0
Actuated g/C Ratio	0.20	0.20	0.20					0.66	1.00	0.05	0.74	1.00
Clearance Time (s)	6.5	6.5	6.5					6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					5.0		2.5	5.0	
Lane Grp Cap (vph)	684	371	315					3366	1583	167	3783	1583
v/s Ratio Prot		0.11						0.16		0.02	0.37	
v/s Ratio Perm	0.14		0.02						0.35			c0.70
v/c Ratio	0.72	0.57	0.11					0.25	0.35	0.34	0.50	0.70
Uniform Delay, d1	56.1	54.2	49.2					10.3	0.0	69.0	7.8	0.0
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.34	0.41	1.00
Incremental Delay, d2	3.6	2.0	0.2					0.2	0.6	0.9	0.5	2.6
Delay (s)	59.7	56.2	49.4					10.4	0.6	93.3	3.7	2.6
Level of Service	E	E	D					B	A	F	A	A
Approach Delay (s)		57.6			0.0			6.5			5.0	
Approach LOS		E			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

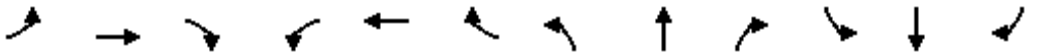
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	710	0	35	945	470	0	0	440	290
Future Volume (vph)	0	0	0	710	0	35	945	470	0	0	440	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	3.5			4.0	4.0
Lane Util. Factor				0.91	0.91	1.00	0.97	0.91			0.91	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3221	1610	1583	3433	5085			5085	1583
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				3221	1610	1583	3433	5085			5085	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	780	0	38	1038	516	0	0	484	319
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	523	257	38	1038	516	0	0	484	319
Turn Type				custom	NA	Free	Prot	NA			NA	Free
Protected Phases				4			1	6			2	
Permitted Phases				4		Free						Free
Actuated Green, G (s)				30.2	30.2	150.0	81.4	108.3			20.4	150.0
Effective Green, g (s)				32.2	30.2	150.0	83.4	110.3			22.4	150.0
Actuated g/C Ratio				0.21	0.20	1.00	0.56	0.74			0.15	1.00
Clearance Time (s)				6.0			6.0	5.5			6.0	
Vehicle Extension (s)				3.0			3.5	5.0			5.0	
Lane Grp Cap (vph)				691	324	1583	1908	3739			759	1583
v/s Ratio Prot				c0.16	0.16		c0.30	0.10			c0.10	
v/s Ratio Perm						0.02						0.20
v/c Ratio				0.76	0.79	0.02	0.54	0.14			0.64	0.20
Uniform Delay, d1				55.2	56.9	0.0	21.2	5.8			60.0	0.0
Progression Factor				1.00	1.00	1.00	1.53	1.74			1.00	1.00
Incremental Delay, d2				4.7	12.5	0.0	1.1	0.1			2.5	0.3
Delay (s)				60.0	69.4	0.0	33.6	10.2			62.4	0.3
Level of Service				E	E	A	C	B			E	A
Approach Delay (s)		0.0			60.2			25.8			37.7	
Approach LOS		A			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

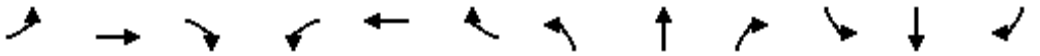


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	50	205	325	35	0	90	180	235	15	200	5
Future Volume (vph)	5	50	205	325	35	0	90	180	235	15	200	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0	6.0	5.0	4.0		4.0	4.5	5.0	4.0	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1863		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	3433	1863		3433	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	53	216	342	37	0	95	189	247	16	211	5
RTOR Reduction (vph)	0	0	198	0	0	0	0	0	71	0	0	3
Lane Group Flow (vph)	5	53	18	342	37	0	95	189	176	16	211	2
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6	3	5	2	
Permitted Phases			4						6			2
Actuated Green, G (s)	9.5	9.5	9.5	17.8	17.8		8.6	63.1	80.9	2.9	57.4	57.4
Effective Green, g (s)	10.5	11.5	9.5	18.8	19.8		9.6	64.6	82.9	3.9	58.9	57.4
Actuated g/C Ratio	0.09	0.10	0.08	0.16	0.17		0.08	0.56	0.71	0.03	0.51	0.49
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.5	3.5		3.0	5.0	3.5	3.0	5.0	5.0
Lane Grp Cap (vph)	159	184	129	554	317		283	1965	1196	59	1792	781
v/s Ratio Prot	0.00	c0.03		c0.10	0.02		c0.03	0.05	c0.02	0.01	0.06	
v/s Ratio Perm			0.01						0.09			0.00
v/c Ratio	0.03	0.29	0.14	0.62	0.12		0.34	0.10	0.15	0.27	0.12	0.00
Uniform Delay, d1	48.3	48.6	49.6	45.4	40.8		50.3	12.1	5.4	54.8	15.1	14.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.9	0.5	2.2	0.2		0.7	0.1	0.1	2.5	0.1	0.0
Delay (s)	48.3	49.5	50.1	47.6	41.0		51.0	12.2	5.4	57.3	15.2	14.9
Level of Service	D	D	D	D	D		D	B	A	E	B	B
Approach Delay (s)		49.9			46.9			16.0			18.1	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	116.3	Sum of lost time (s)	18.5
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

2040 No-Build

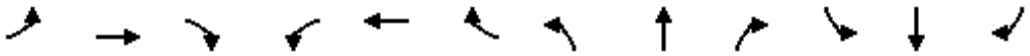


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	1235	545	225	2205	275	285	100	75	450	510	1015
Future Volume (vph)	240	1235	545	225	2205	275	285	100	75	450	510	1015
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0	4.0	5.5	5.5	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.86	0.86	1.00	0.91	0.86	0.91
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1522	4669	1583	1610	2968	1441
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1522	4669	1583	1610	2968	1441
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	1342	592	245	2397	299	310	109	82	489	554	1103
RTOR Reduction (vph)	0	0	170	0	0	62	0	0	73	0	110	30
Lane Group Flow (vph)	261	1342	422	245	2397	237	155	264	9	440	1045	521
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	pm+ov
Protected Phases	1	6		5	2		3	3		4	4	1
Permitted Phases			6			2			3			4
Actuated Green, G (s)	16.1	66.5	66.5	11.0	61.4	61.4	16.0	16.0	16.0	37.5	37.5	53.6
Effective Green, g (s)	16.1	66.5	66.5	11.0	61.4	61.4	16.0	16.0	16.0	37.5	37.5	53.6
Actuated g/C Ratio	0.11	0.44	0.44	0.07	0.41	0.41	0.11	0.11	0.11	0.25	0.25	0.36
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0	4.0	5.5	5.5	4.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	368	1568	701	251	1448	647	162	498	168	402	742	514
v/s Ratio Prot	0.08	0.38		0.07	c0.68		c0.10	0.06		0.27	c0.35	c0.11
v/s Ratio Perm			0.27			0.15			0.01			0.25
v/c Ratio	0.71	0.86	0.60	0.98	1.66	0.37	0.96	0.87dl	0.05	1.09	1.41	1.01
Uniform Delay, d1	64.7	37.5	31.7	69.4	44.3	30.8	66.7	63.4	60.2	56.2	56.2	48.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	6.2	3.8	49.6	298.0	1.6	57.3	1.1	0.1	72.8	191.6	43.0
Delay (s)	70.8	43.7	35.5	119.0	342.3	32.4	124.0	64.5	60.3	129.1	247.9	91.2
Level of Service	E	D	D	F	F	C	F	E	E	F	F	F
Approach Delay (s)		44.7			292.2			82.2			183.3	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	178.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.42		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	122.0%	ICU Level of Service	H
Analysis Period (min)	15		

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

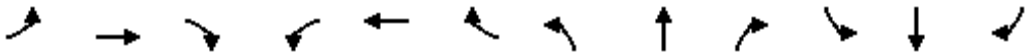
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	90	70	0	55	25	590	15	15	1930	20
Future Volume (Veh/h)	0	0	90	70	0	55	25	590	15	15	1930	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	0	103	80	0	63	29	678	17	17	2218	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	3062	3016	2230	3091	3011	678	2241			695		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3062	3016	2230	3091	3011	678	2241			695		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	0	0	100	86	87			98		
cM capacity (veh/h)	6	11	54	0	11	452	230			901		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	103	143	29	678	17	17	2241
Volume Left	0	80	29	0	0	17	0
Volume Right	103	63	0	0	17	0	23
cSH	54	0	230	1700	1700	901	1700
Volume to Capacity	1.90	Err	0.13	0.40	0.01	0.02	1.32
Queue Length 95th (ft)	249	Err	11	0	0	1	0
Control Delay (s)	585.0	Err	22.9	0.0	0.0	9.1	0.0
Lane LOS	F	F	C			A	
Approach Delay (s)	585.0	Err	0.9			0.1	
Approach LOS	F	F					

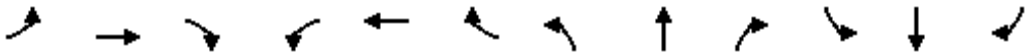
Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	123.4%	ICU Level of Service	H	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	5	10	645	5	735	10	590	105	175	1210	5
Future Volume (vph)	20	5	10	645	5	735	10	590	105	175	1210	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.96			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1739			1775	1583	1770	1863	1583	1770	1862	
Flt Permitted		0.30			0.70	1.00	0.09	1.00	1.00	0.18	1.00	
Satd. Flow (perm)		535			1305	1583	173	1863	1583	336	1862	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	21	5	11	686	5	782	11	628	112	186	1287	5
RTOR Reduction (vph)	0	8	0	0	0	306	0	0	62	0	0	0
Lane Group Flow (vph)	0	29	0	0	691	476	11	628	50	186	1292	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8	6		6	2		
Actuated Green, G (s)		24.0			24.0	24.0	44.9	43.0	43.0	60.6	53.7	
Effective Green, g (s)		24.0			24.0	24.0	44.9	43.0	43.0	60.6	53.7	
Actuated g/C Ratio		0.25			0.25	0.25	0.46	0.45	0.45	0.63	0.56	
Clearance Time (s)		6.0			6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	4.0	6.0	6.0	4.0	6.0	
Lane Grp Cap (vph)		132			324	393	111	829	704	397	1035	
v/s Ratio Prot							0.00	0.34		c0.06	c0.69	
v/s Ratio Perm		0.05			c0.53	0.30	0.04		0.03	0.23		
v/c Ratio		0.22			2.13	1.21	0.10	0.76	0.07	0.47	1.25	
Uniform Delay, d1		28.8			36.3	36.3	21.8	22.4	15.4	12.7	21.4	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.8			520.0	116.6	0.5	6.4	0.2	1.2	119.9	
Delay (s)		29.7			556.3	152.9	22.4	28.8	15.5	13.9	141.3	
Level of Service		C			F	F	C	C	B	B	F	
Approach Delay (s)		29.7			342.1			26.8			125.3	
Approach LOS		C			F			C			F	

Intersection Summary			
HCM 2000 Control Delay	190.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.51		
Actuated Cycle Length (s)	96.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	129.2%	ICU Level of Service	H
Analysis Period (min)	15		

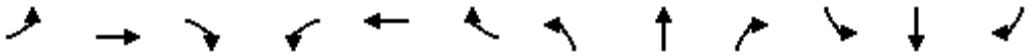
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	35	45	0	15	35	1195	80	15	1230	15
Future Volume (vph)	55	0	35	45	0	15	35	1195	80	15	1230	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0			8.0		5.0	10.0	10.0	5.0	10.0	
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.95			0.97		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97			0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1713			1734		1770	1863	1583	1770	1859	
Flt Permitted		0.78			0.72		0.08	1.00	1.00	0.08	1.00	
Satd. Flow (perm)		1371			1292		140	1863	1583	144	1859	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	0	37	47	0	16	37	1258	84	16	1295	16
RTOR Reduction (vph)	0	87	0	0	59	0	0	0	39	0	0	0
Lane Group Flow (vph)	0	8	0	0	4	0	37	1258	45	16	1311	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			3		1	6		5	2	
Permitted Phases	4			3			6		6	2		
Actuated Green, G (s)		7.9			5.7		56.8	53.1	53.1	54.0	51.7	
Effective Green, g (s)		7.9			5.7		56.8	53.1	53.1	54.0	51.7	
Actuated g/C Ratio		0.08			0.06		0.57	0.53	0.53	0.54	0.52	
Clearance Time (s)		8.0			8.0		5.0	10.0	10.0	5.0	10.0	
Vehicle Extension (s)		5.0			5.0		3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)		108			73		139	989	840	115	961	
v/s Ratio Prot							c0.01	0.68		0.00	c0.71	
v/s Ratio Perm		c0.01			c0.00		0.14		0.03	0.07		
v/c Ratio		0.07			0.05		0.27	1.27	0.05	0.14	1.36	
Uniform Delay, d1		42.6			44.6		21.8	23.4	11.3	22.2	24.1	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.6			0.6		1.0	130.4	0.1	0.6	170.6	
Delay (s)		43.2			45.2		22.9	153.8	11.4	22.7	194.8	
Level of Service		D			D		C	F	B	C	F	
Approach Delay (s)		43.2			45.2			141.6			192.7	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	159.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

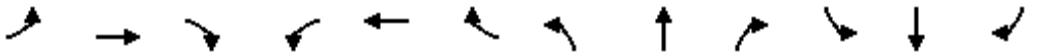
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	25	75	250	30	355	130	1165	120	445	750	95
Future Volume (vph)	45	25	75	250	30	355	130	1165	120	445	750	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		2.0	2.0	4.0	4.0	6.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91	1.00	0.97	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1805	1583		1783	1583	1770	5085	1583	3433	3480	
Flt Permitted		0.36	1.00		0.69	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		678	1583		1290	1583	1770	5085	1583	3433	3480	
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)	49	27	82	272	33	386	141	1266	130	484	815	103
RTOR Reduction (vph)	0	0	64	0	0	295	0	0	71	0	6	0
Lane Group Flow (vph)	0	76	18	0	305	91	141	1266	59	484	912	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8			6			
Actuated Green, G (s)		24.0	24.0		26.0	26.0	14.8	54.1	54.1	24.0	63.3	
Effective Green, g (s)		26.0	26.0		28.0	28.0	15.8	56.1	54.1	25.0	65.3	
Actuated g/C Ratio		0.22	0.22		0.24	0.24	0.13	0.47	0.45	0.21	0.55	
Clearance Time (s)		6.0	6.0		4.0	4.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)		148	345		303	372	234	2395	719	720	1908	
v/s Ratio Prot							0.08	c0.25		c0.14	0.26	
v/s Ratio Perm		0.11	0.01		c0.24	0.06			0.04			
v/c Ratio		0.51	0.05		1.01	0.24	0.60	0.53	0.08	0.67	0.48	
Uniform Delay, d1		41.0	36.8		45.5	37.0	48.7	22.2	18.4	43.3	16.5	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		3.0	0.1		53.4	0.3	4.3	0.8	0.2	3.2	0.9	
Delay (s)		44.0	36.9		98.9	37.3	53.0	23.0	18.6	46.5	17.3	
Level of Service		D	D		F	D	D	C	B	D	B	
Approach Delay (s)		40.3			64.5			25.4			27.4	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	119.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

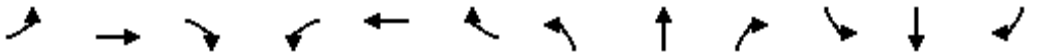
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	110	10	185	130	1075	25	255	170	885	455	240
Future Volume (vph)	100	110	10	185	130	1075	25	255	170	885	455	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5
Lane Util. Factor	0.94	0.95		0.97	1.00	1.00	1.00	0.91	1.00	0.94	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	4990	3493		3433	1863	1583	1770	5085	1583	4990	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	4990	3493		3433	1863	1583	1770	5085	1583	4990	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	116	11	195	137	1132	26	268	179	932	479	253
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	118	0	0	117
Lane Group Flow (vph)	105	121	0	195	137	1132	26	268	61	932	479	136
Turn Type	Split	NA		Split	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases						Free			6			2
Actuated Green, G (s)	8.9	8.9		12.0	12.0	100.1	3.9	32.0	32.0	24.2	52.3	52.3
Effective Green, g (s)	10.9	10.9		14.0	14.0	100.1	4.9	34.0	34.0	25.2	53.8	53.8
Actuated g/C Ratio	0.11	0.11		0.14	0.14	1.00	0.05	0.34	0.34	0.25	0.54	0.54
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	543	380		480	260	1583	86	1727	537	1256	1902	850
v/s Ratio Prot	0.02	0.03		0.06	0.07		0.01	0.05		0.19	0.14	
v/s Ratio Perm						c0.71			0.04			0.09
v/c Ratio	0.19	0.32		0.41	0.53	0.72	0.30	0.16	0.11	0.74	0.25	0.16
Uniform Delay, d1	40.6	41.2		39.3	40.0	0.0	45.9	23.0	22.7	34.5	12.4	11.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.4		0.4	1.5	2.8	2.0	0.2	0.4	2.4	0.3	0.4
Delay (s)	40.7	41.5		39.7	41.4	2.8	47.9	23.2	23.1	36.9	12.7	12.1
Level of Service	D	D		D	D	A	D	C	C	D	B	B
Approach Delay (s)		41.2			11.3			24.5			26.1	
Approach LOS		D			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.1	Sum of lost time (s)	16.5
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

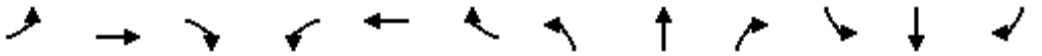
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	20	20	0	0	0	0	1020	310	60	1520	220
Future Volume (vph)	130	20	20	0	0	0	0	1020	310	60	1520	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5					4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00					0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583					5085	1583	3433	5085	1583
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583					5085	1583	3433	5085	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	21	21	0	0	0	0	1074	337	65	1652	239
RTOR Reduction (vph)	0	0	19	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	137	21	2	0	0	0	0	1074	337	65	1652	239
Turn Type	Perm	NA	Perm					NA	Free	Prot	NA	Free
Protected Phases		4						6		5	2	
Permitted Phases	4		4						Free			Free
Actuated Green, G (s)	9.9	9.9	9.9					78.3	112.6	5.9	90.2	112.6
Effective Green, g (s)	11.9	11.9	11.9					80.3	112.6	6.9	92.2	112.6
Actuated g/C Ratio	0.11	0.11	0.11					0.71	1.00	0.06	0.82	1.00
Clearance Time (s)	6.5	6.5	6.5					6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					5.0		2.5	5.0	
Lane Grp Cap (vph)	362	196	167					3626	1583	210	4163	1583
v/s Ratio Prot		0.01						0.21		0.02	c0.32	
v/s Ratio Perm	c0.04		0.00						0.21			0.15
v/c Ratio	0.38	0.11	0.01					0.30	0.21	0.31	0.40	0.15
Uniform Delay, d1	46.9	45.5	45.1					5.9	0.0	50.6	2.7	0.0
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2	0.0					0.2	0.3	0.6	0.3	0.2
Delay (s)	47.6	45.8	45.1					6.1	0.3	51.2	3.0	0.2
Level of Service	D	D	D					A	A	D	A	A
Approach Delay (s)		47.1			0.0			4.7			4.3	
Approach LOS		D			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	112.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

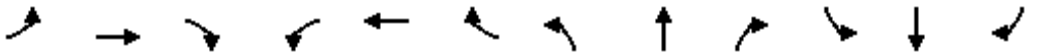
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	410	0	60	750	1250	0	0	575	830
Future Volume (vph)	0	0	0	410	0	60	750	1250	0	0	575	830
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	3.5			4.0	4.0
Lane Util. Factor				0.91	0.91	1.00	0.97	0.91			0.91	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3221	1610	1583	3433	5085			5085	1583
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				3221	1610	1583	3433	5085			5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	456	0	67	833	1389	0	0	639	922
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	306	150	67	833	1389	0	0	639	922
Turn Type				custom	NA	Free	Prot	NA			NA	Free
Protected Phases				4			1	6			2	
Permitted Phases				4		Free						Free
Actuated Green, G (s)				13.9	13.9	77.6	25.4	52.2			20.3	77.6
Effective Green, g (s)				15.9	13.9	77.6	27.4	54.2			22.3	77.6
Actuated g/C Ratio				0.20	0.18	1.00	0.35	0.70			0.29	1.00
Clearance Time (s)				6.0			6.0	5.5			6.0	
Vehicle Extension (s)				3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)				659	288	1583	1212	3551			1461	1583
v/s Ratio Prot				0.10	0.09		c0.24	0.27			0.13	
v/s Ratio Perm						0.04						c0.58
v/c Ratio				0.46	0.52	0.04	0.69	0.39			0.44	0.58
Uniform Delay, d1				27.1	28.8	0.0	21.4	4.9			22.5	0.0
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				0.5	1.7	0.1	1.6	0.1			0.2	1.6
Delay (s)				27.6	30.5	0.1	23.1	4.9			22.7	1.6
Level of Service				C	C	A	C	A			C	A
Approach Delay (s)		0.0			24.9			11.7			10.2	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	77.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

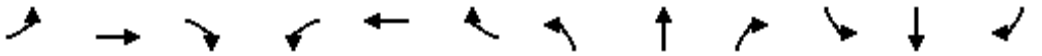
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	100	265	815	290	20	260	630	445	25	310	30
Future Volume (vph)	40	100	265	815	290	20	260	630	445	25	310	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0	6.0	5.0	4.0		4.0	4.0	5.0	4.0	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1845		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	3433	1845		3433	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	43	106	282	867	309	21	277	670	473	27	330	32
RTOR Reduction (vph)	0	0	250	0	1	0	0	0	159	0	0	25
Lane Group Flow (vph)	43	106	32	867	329	0	277	670	314	27	330	7
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6	3	5	2	
Permitted Phases			4						6			2
Actuated Green, G (s)	12.4	12.4	12.4	37.4	37.4		14.1	35.0	72.4	4.6	25.0	25.0
Effective Green, g (s)	13.4	14.4	12.4	38.4	39.4		15.1	36.5	74.4	5.6	26.5	25.0
Actuated g/C Ratio	0.12	0.13	0.11	0.34	0.35		0.13	0.33	0.66	0.05	0.24	0.22
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		5.0	5.5	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	211	239	175	1178	649		463	1154	1052	88	838	353
v/s Ratio Prot	0.02	c0.06		c0.25	0.18		c0.08	c0.19	0.10	0.02	0.09	
v/s Ratio Perm			0.02						0.10			0.00
v/c Ratio	0.20	0.44	0.18	0.74	0.51		0.60	0.58	0.30	0.31	0.39	0.02
Uniform Delay, d1	44.4	45.0	45.2	32.3	28.6		45.5	31.3	7.8	51.3	35.9	33.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	1.3	0.5	2.4	0.6		2.1	0.7	0.2	2.0	0.3	0.0
Delay (s)	44.9	46.4	45.7	34.7	29.2		47.6	32.1	8.0	53.3	36.2	33.9
Level of Service	D	D	D	C	C		D	C	A	D	D	C
Approach Delay (s)		45.8			33.2			27.1			37.2	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	111.9	Sum of lost time (s)	18.5
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

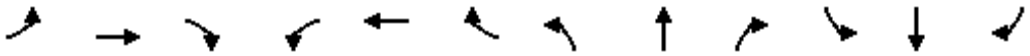
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1125	2445	170	145	1640	630	460	475	235	595	160	435
Future Volume (vph)	1125	2445	170	145	1640	630	460	475	235	595	160	435
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0	4.0	5.5	5.5	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.86	0.86	1.00	0.91	0.86	0.91
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00	0.95	0.98	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1522	4729	1583	1610	3006	1441
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00	0.95	0.98	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1522	4729	1583	1610	3006	1441
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1184	2574	179	153	1726	663	484	500	247	626	168	458
RTOR Reduction (vph)	0	0	39	0	0	193	0	0	97	0	20	28
Lane Group Flow (vph)	1184	2574	140	153	1726	470	242	742	150	326	617	261
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	pm+ov
Protected Phases	1	6		5	2		3	3		4	4	1
Permitted Phases			6			2			3			4
Actuated Green, G (s)	34.0	73.5	73.5	8.0	47.5	47.5	24.0	24.0	24.0	25.5	25.5	59.5
Effective Green, g (s)	34.0	73.5	73.5	8.0	47.5	47.5	24.0	24.0	24.0	25.5	25.5	59.5
Actuated g/C Ratio	0.23	0.49	0.49	0.05	0.32	0.32	0.16	0.16	0.16	0.17	0.17	0.40
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0	4.0	5.5	5.5	4.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	5.0	5.0	3.0
Lane Grp Cap (vph)	778	1734	775	183	1120	501	243	756	253	273	511	571
v/s Ratio Prot	c0.34	c0.73		0.04	0.49		c0.16	0.16		0.20	c0.21	0.10
v/s Ratio Perm			0.09			0.30			0.09			0.08
v/c Ratio	1.52	1.48	0.18	0.84	1.54	0.94	1.00	0.98	0.59	1.19	1.21	0.46
Uniform Delay, d1	58.0	38.2	21.4	70.4	51.2	49.8	63.0	62.8	58.4	62.2	62.2	33.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	241.4	221.1	0.5	26.8	248.0	27.5	56.2	28.0	3.7	117.5	110.7	0.6
Delay (s)	299.4	259.4	21.9	97.1	299.2	77.4	119.2	90.8	62.1	179.8	173.0	33.9
Level of Service	F	F	C	F	F	E	F	F	E	F	F	C
Approach Delay (s)		260.6			229.2			90.6			142.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	211.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	124.7%	ICU Level of Service	H
Analysis Period (min)	15		

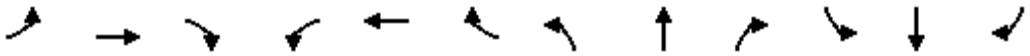
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	45	30	0	30	115	2005	190	65	1130	65
Future Volume (Veh/h)	20	0	45	30	0	30	115	2005	190	65	1130	65
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	20	0	45	30	0	30	116	2025	192	66	1141	66
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	3593	3755	1174	3575	3596	2025	1207			2217		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3593	3755	1174	3575	3596	2025	1207			2217		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	81	0	100	59	80			72		
cM capacity (veh/h)	1	2	234	2	3	72	578			235		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	65	60	116	2025	192	66	1207
Volume Left	20	30	116	0	0	66	0
Volume Right	45	30	0	0	192	0	66
cSH	4	3	578	1700	1700	235	1700
Volume to Capacity	17.02	18.17	0.20	1.19	0.11	0.28	0.71
Queue Length 95th (ft)	Err	Err	19	0	0	28	0
Control Delay (s)	Err	Err	12.8	0.0	0.0	26.1	0.0
Lane LOS	F	F	B			D	
Approach Delay (s)	Err	Err	0.6			1.4	
Approach LOS	F	F					

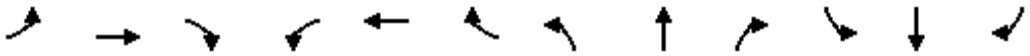
Intersection Summary				
Average Delay	335.9			
Intersection Capacity Utilization	118.0%	ICU Level of Service	H	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	5	0	195	5	630	10	1360	705	770	1360	30
Future Volume (vph)	20	5	0	195	5	630	10	1360	705	770	1360	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.96			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1790			1776	1583	1770	1863	1583	1770	1857	
Flt Permitted		0.74			0.71	1.00	0.09	1.00	1.00	0.08	1.00	
Satd. Flow (perm)		1375			1327	1583	173	1863	1583	155	1857	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	21	5	0	203	5	656	10	1417	734	802	1417	31
RTOR Reduction (vph)	0	0	0	0	0	288	0	0	283	0	0	0
Lane Group Flow (vph)	0	26	0	0	208	368	10	1417	451	802	1448	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8	6		6	2		
Actuated Green, G (s)		24.0			24.0	24.0	45.0	43.0	43.0	68.0	61.0	
Effective Green, g (s)		24.0			24.0	24.0	45.0	43.0	43.0	68.0	61.0	
Actuated g/C Ratio		0.23			0.23	0.23	0.43	0.41	0.41	0.65	0.59	
Clearance Time (s)		6.0			6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	4.0	6.0	6.0	4.0	6.0	
Lane Grp Cap (vph)		317			306	365	105	770	654	411	1089	
v/s Ratio Prot							0.00	0.76		c0.37	0.78	
v/s Ratio Perm		0.02			0.16	c0.23	0.04		0.28	c0.90		
v/c Ratio		0.08			0.68	1.01	0.10	1.84	0.69	1.95	1.33	
Uniform Delay, d1		31.4			36.5	40.0	24.2	30.5	25.0	33.6	21.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1			5.9	48.9	0.5	383.2	5.9	436.9	154.6	
Delay (s)		31.5			42.4	88.9	24.7	413.7	30.9	470.5	176.1	
Level of Service		C			D	F	C	F	C	F	F	
Approach Delay (s)		31.5			77.7			281.9			281.0	
Approach LOS		C			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	247.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.75		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	141.1%	ICU Level of Service	H
Analysis Period (min)	15		

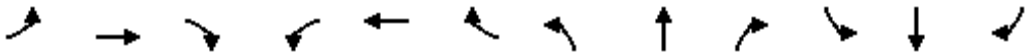
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	5	15	155	0	30	75	1775	70	75	1890	80
Future Volume (vph)	25	5	15	155	0	30	75	1775	70	75	1890	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0			8.0		5.0	10.0	10.0	5.0	10.0	
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.95			0.98		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.97			0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1729			1748		1770	1863	1583	1770	1851	
Flt Permitted		0.72			0.60		0.08	1.00	1.00	0.08	1.00	
Satd. Flow (perm)		1286			1090		143	1863	1583	143	1851	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	5	16	163	0	32	79	1868	74	79	1989	84
RTOR Reduction (vph)	0	13	0	0	118	0	0	0	40	0	1	0
Lane Group Flow (vph)	0	34	0	0	77	0	79	1868	34	79	2072	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			3		1	6		5	2	
Permitted Phases	4			3			6		6	2		
Actuated Green, G (s)		8.4			14.9		58.3	52.0	52.0	58.3	52.0	
Effective Green, g (s)		8.4			14.9		58.3	52.0	52.0	58.3	52.0	
Actuated g/C Ratio		0.07			0.13		0.52	0.46	0.46	0.52	0.46	
Clearance Time (s)		8.0			8.0		5.0	10.0	10.0	5.0	10.0	
Vehicle Extension (s)		5.0			5.0		3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)		95			144		165	860	731	165	854	
v/s Ratio Prot							c0.03	1.00		0.03	c1.12	
v/s Ratio Perm		c0.03			c0.07		0.22		0.02	0.22		
v/c Ratio		0.36			0.53		0.48	2.17	0.05	0.48	2.43	
Uniform Delay, d1		49.5			45.6		24.4	30.3	16.7	24.4	30.3	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		4.8			6.8		2.2	531.3	0.1	2.2	645.6	
Delay (s)		54.3			52.4		26.6	561.6	16.8	26.6	675.9	
Level of Service		D			D		C	F	B	C	F	
Approach Delay (s)		54.3			52.4			520.7			652.1	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	559.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.72		
Actuated Cycle Length (s)	112.6	Sum of lost time (s)	31.0
Intersection Capacity Utilization	134.6%	ICU Level of Service	H
Analysis Period (min)	15		

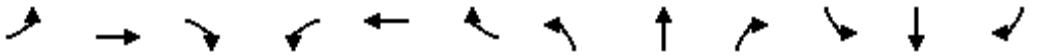
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	50	125	405	45	590	145	1290	345	470	1340	165
Future Volume (vph)	15	50	125	405	45	590	145	1290	345	470	1340	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0	6.0	3.0	4.0	4.0	3.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91	1.00	0.97	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1841	1583		1782	1583	1770	5085	1583	3433	3481	
Flt Permitted		0.50	1.00		0.70	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		925	1583		1300	1583	1770	5085	1583	3433	3481	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	53	132	426	47	621	153	1358	363	495	1411	174
RTOR Reduction (vph)	0	0	99	0	0	385	0	0	253	0	6	0
Lane Group Flow (vph)	0	69	33	0	473	236	153	1358	110	495	1579	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8			6			
Actuated Green, G (s)		34.0	34.0		34.0	34.0	16.7	39.0	39.0	45.0	67.3	
Effective Green, g (s)		36.0	34.0		36.0	34.0	18.7	41.0	41.0	47.0	69.3	
Actuated g/C Ratio		0.27	0.25		0.27	0.25	0.14	0.30	0.30	0.35	0.51	
Clearance Time (s)		6.0	6.0		6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)		246	398		346	398	245	1544	480	1195	1786	
v/s Ratio Prot							c0.09	0.27		0.14	c0.45	
v/s Ratio Perm		0.07	0.02		c0.36	0.15			0.07			
v/c Ratio		0.28	0.08		1.37	0.59	0.62	0.88	0.23	0.41	0.88	
Uniform Delay, d1		39.2	38.6		49.5	44.4	54.8	44.7	35.2	33.5	29.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.08	0.50	
Incremental Delay, d2		2.8	0.4		182.7	6.3	4.9	7.5	1.1	0.9	5.9	
Delay (s)		42.1	39.0		232.2	50.8	59.7	52.1	36.3	37.2	20.6	
Level of Service		D	D		F	D	E	D	D	D	C	
Approach Delay (s)		40.1			129.2			49.7			24.6	
Approach LOS		D			F			D			C	

Intersection Summary			
HCM 2000 Control Delay	55.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		

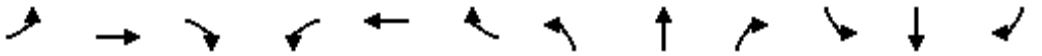
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	335	260	45	465	310	1040	60	680	450	1055	660	585
Future Volume (vph)	335	260	45	465	310	1040	60	680	450	1055	660	585
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5
Lane Util. Factor	0.94	0.95		0.97	1.00	1.00	1.00	0.91	1.00	0.94	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	4990	3461		3433	1863	1583	1770	5085	1583	4990	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	4990	3461		3433	1863	1583	1770	5085	1583	4990	3539	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	345	268	46	479	320	1072	62	701	464	1088	680	603
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	352	0	0	310
Lane Group Flow (vph)	345	301	0	479	320	1072	62	701	112	1088	680	293
Turn Type	Split	NA		Split	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases						Free			6			2
Actuated Green, G (s)	17.0	17.0		22.0	22.0	135.0	8.8	28.5	28.5	44.5	64.2	64.2
Effective Green, g (s)	19.0	19.0		24.0	24.0	135.0	9.8	30.5	30.5	45.5	65.7	65.7
Actuated g/C Ratio	0.14	0.14		0.18	0.18	1.00	0.07	0.23	0.23	0.34	0.49	0.49
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	702	487		610	331	1583	128	1148	357	1681	1722	770
v/s Ratio Prot	0.07	0.09		0.14	c0.17		0.04	0.14		0.22	0.19	
v/s Ratio Perm						c0.68			0.07			0.19
v/c Ratio	0.49	0.62		0.79	0.97	0.68	0.48	0.61	0.31	0.65	0.39	0.38
Uniform Delay, d1	53.5	54.6		53.0	55.1	0.0	60.2	46.9	43.5	37.9	22.0	21.8
Progression Factor	1.00	1.00		0.78	0.79	1.00	1.00	1.00	1.00	1.02	0.37	0.16
Incremental Delay, d2	0.4	2.0		3.3	26.8	1.2	2.9	2.4	2.3	1.0	0.6	1.2
Delay (s)	53.9	56.6		44.7	70.2	1.2	63.0	49.3	45.8	39.5	8.7	4.7
Level of Service	D	E		D	E	A	E	D	D	D	A	A
Approach Delay (s)		55.2			24.1			48.7			21.8	
Approach LOS		E			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		

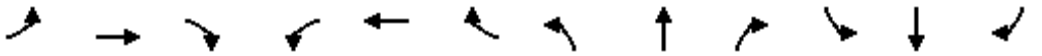
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	385	185	65	0	0	0	0	1200	805	95	2190	640
Future Volume (vph)	385	185	65	0	0	0	0	1200	805	95	2190	640
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5					4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00					0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583					5085	1583	3433	5085	1583
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583					5085	1583	3433	5085	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	405	195	68	0	0	0	0	1263	847	100	2305	674
RTOR Reduction (vph)	0	0	56	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	405	195	12	0	0	0	0	1263	847	100	2305	674
Turn Type	Perm	NA	Perm					NA	Free	Prot	NA	Free
Protected Phases		4						6		5	2	
Permitted Phases	4		4						Free			Free
Actuated Green, G (s)	21.8	21.8	21.8					85.9	135.0	8.8	100.7	135.0
Effective Green, g (s)	23.8	23.8	23.8					87.9	135.0	9.8	102.7	135.0
Actuated g/C Ratio	0.18	0.18	0.18					0.65	1.00	0.07	0.76	1.00
Clearance Time (s)	6.5	6.5	6.5					6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					5.0		2.5	5.0	
Lane Grp Cap (vph)	605	328	279					3310	1583	249	3868	1583
v/s Ratio Prot		0.10						0.25		0.03	c0.45	
v/s Ratio Perm	c0.12		0.01						c0.53			0.43
v/c Ratio	0.67	0.59	0.04					0.38	0.54	0.40	0.60	0.43
Uniform Delay, d1	51.9	51.2	46.1					10.9	0.0	59.8	7.1	0.0
Progression Factor	1.00	1.00	1.00					0.90	1.00	1.32	0.43	1.00
Incremental Delay, d2	2.8	2.9	0.1					0.3	1.1	0.7	0.7	0.8
Delay (s)	54.7	54.0	46.2					10.1	1.1	79.5	3.7	0.8
Level of Service	D	D	D					B	A	E	A	A
Approach Delay (s)		53.7			0.0			6.5			5.5	
Approach LOS		D			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

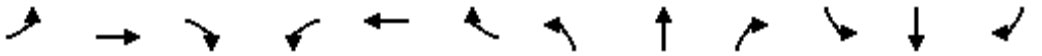
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	705	0	90	860	1280	0	0	685	745
Future Volume (vph)	0	0	0	705	0	90	860	1280	0	0	685	745
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	3.5			4.0	4.0
Lane Util. Factor				0.91	0.91	1.00	0.97	0.91			0.91	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3221	1610	1583	3433	5085			5085	1583
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				3221	1610	1583	3433	5085			5085	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	750	0	96	915	1362	0	0	729	793
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	502	248	96	915	1362	0	0	729	793
Turn Type				custom	NA	Free	Prot	NA			NA	Free
Protected Phases				4			1	6			2	
Permitted Phases				4		Free						Free
Actuated Green, G (s)				26.3	26.3	135.0	66.7	97.2			24.0	135.0
Effective Green, g (s)				28.3	26.3	135.0	68.7	99.2			26.0	135.0
Actuated g/C Ratio				0.21	0.19	1.00	0.51	0.73			0.19	1.00
Clearance Time (s)				6.0			6.0	5.5			6.0	
Vehicle Extension (s)				3.0			3.5	5.0			5.0	
Lane Grp Cap (vph)				675	313	1583	1747	3736			979	1583
v/s Ratio Prot				c0.16	0.15		0.27	0.27			c0.14	
v/s Ratio Perm						0.06						c0.50
v/c Ratio				0.74	0.79	0.06	0.52	0.36			0.74	0.50
Uniform Delay, d1				50.0	51.7	0.0	22.2	6.5			51.4	0.0
Progression Factor				1.00	1.00	1.00	0.94	0.98			1.00	1.00
Incremental Delay, d2				4.4	12.8	0.1	1.1	0.1			3.7	1.1
Delay (s)				54.4	64.6	0.1	22.0	6.4			55.1	1.1
Level of Service				D	E	A	C	A			E	A
Approach Delay (s)		0.0			51.2			12.7			27.0	
Approach LOS		A			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		

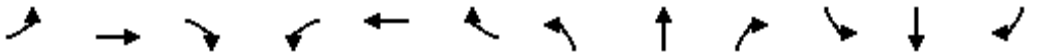
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	345	265	500	165	20	320	460	605	20	675	100
Future Volume (vph)	85	345	265	500	165	20	320	460	605	20	675	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0	6.0	5.0	4.0		4.0	4.5	5.0	4.0	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		0.97	0.95	1.00	1.00	0.81	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1833		3433	3539	1583	1770	7544	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	3433	1833		3433	3539	1583	1770	7544	1583
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	96	388	298	562	185	22	360	517	680	22	758	112
RTOR Reduction (vph)	0	0	193	0	4	0	0	0	149	0	0	82
Lane Group Flow (vph)	96	388	105	562	203	0	360	517	531	22	758	30
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6	3	5	2	
Permitted Phases			4						6			2
Actuated Green, G (s)	24.1	24.1	24.1	30.2	30.2		14.9	44.4	74.6	4.7	34.2	34.2
Effective Green, g (s)	25.1	26.1	24.1	31.2	32.2		15.9	45.9	76.6	5.7	35.7	34.2
Actuated g/C Ratio	0.20	0.21	0.19	0.25	0.25		0.13	0.36	0.61	0.05	0.28	0.27
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.5	3.5		3.0	5.0	3.5	3.0	5.0	5.0
Lane Grp Cap (vph)	351	384	301	847	466		431	1285	1021	79	2130	428
v/s Ratio Prot	0.05	c0.21		c0.16	0.11		c0.10	0.15	c0.13	0.01	0.10	
v/s Ratio Perm			0.07						0.21			0.02
v/c Ratio	0.27	1.01	0.35	0.66	0.44		0.84	0.40	0.52	0.28	0.36	0.07
Uniform Delay, d1	42.9	50.2	44.4	42.9	39.5		54.0	30.0	14.3	58.4	36.2	34.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	48.6	0.7	2.1	0.8		13.1	0.9	0.5	1.9	0.5	0.3
Delay (s)	43.3	98.7	45.1	44.9	40.3		67.1	31.0	14.9	60.3	36.6	34.6
Level of Service	D	F	D	D	D		E	C	B	E	D	C
Approach Delay (s)		71.5			43.7			32.3			37.0	
Approach LOS		E			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	43.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	126.4	Sum of lost time (s)	18.5
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

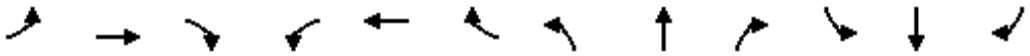
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	570	1345	135	80	1520	540	135	100	75	495	170	445
Future Volume (vph)	570	1345	135	80	1520	540	135	100	75	495	170	445
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0	4.0	5.5	5.5	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.86	0.86	1.00	0.91	0.86	0.91
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00	0.95	0.98	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1522	4711	1583	1610	2990	1441
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00	0.95	0.98	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1522	4711	1583	1610	2990	1441
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	588	1387	139	82	1567	557	139	103	77	510	175	459
RTOR Reduction (vph)	0	0	39	0	0	174	0	0	71	0	32	28
Lane Group Flow (vph)	588	1387	100	82	1567	383	69	173	6	296	550	238
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	pm+ov
Protected Phases	1	6		5	2		3	3		4	4	1
Permitted Phases			6			2			3			4
Actuated Green, G (s)	27.8	78.4	78.4	9.0	59.6	59.6	11.0	11.0	11.0	32.6	32.6	60.4
Effective Green, g (s)	27.8	78.4	78.4	9.0	59.6	59.6	11.0	11.0	11.0	32.6	32.6	60.4
Actuated g/C Ratio	0.19	0.52	0.52	0.06	0.40	0.40	0.07	0.07	0.07	0.22	0.22	0.40
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0	4.0	5.5	5.5	4.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	5.0	5.0	3.0
Lane Grp Cap (vph)	636	1849	827	205	1406	628	111	345	116	349	649	580
v/s Ratio Prot	c0.17	0.39		0.02	c0.44		c0.05	0.04		0.18	c0.18	0.08
v/s Ratio Perm			0.06			0.24			0.00			0.09
v/c Ratio	0.92	0.75	0.12	0.40	1.11	0.61	0.62	0.50	0.05	0.85	0.85	0.41
Uniform Delay, d1	60.1	28.1	18.2	67.9	45.2	35.9	67.5	66.9	64.6	56.3	56.3	32.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.3	2.9	0.3	1.3	61.9	4.4	10.3	1.1	0.2	18.7	11.0	0.5
Delay (s)	79.4	31.0	18.5	69.2	107.1	40.3	77.8	68.0	64.8	75.0	67.3	32.5
Level of Service	E	C	B	E	F	D	E	E	E	E	E	C
Approach Delay (s)		43.6			88.8			69.4			61.2	
Approach LOS		D			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	65.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		

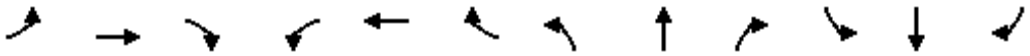
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	45	40	0	30	70	1080	55	25	1050	20
Future Volume (Veh/h)	20	0	45	40	0	30	70	1080	55	25	1050	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	21	0	47	42	0	31	73	1125	57	26	1094	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2458	2484	1104	2464	2438	1125	1115			1182		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2458	2484	1104	2464	2438	1125	1115			1182		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	82	0	100	88	88			96		
cM capacity (veh/h)	16	25	257	15	27	250	626			591		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	68	73	73	1125	57	26	1115
Volume Left	21	42	73	0	0	26	0
Volume Right	47	31	0	0	57	0	21
cSH	46	25	626	1700	1700	591	1700
Volume to Capacity	1.49	2.94	0.12	0.66	0.03	0.04	0.66
Queue Length 95th (ft)	166	226	10	0	0	3	0
Control Delay (s)	447.1	1206.7	11.5	0.0	0.0	11.4	0.0
Lane LOS	F	F	B			B	
Approach Delay (s)	447.1	1206.7	0.7			0.3	
Approach LOS	F	F					

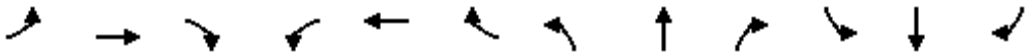
Intersection Summary				
Average Delay	47.2			
Intersection Capacity Utilization	72.1%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	5	0	195	0	630	10	860	220	465	850	15
Future Volume (vph)	15	5	0	195	0	630	10	860	220	465	850	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.96			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1794			1770	1583	1770	1863	1583	1770	1858	
Flt Permitted		0.77			0.74	1.00	0.16	1.00	1.00	0.08	1.00	
Satd. Flow (perm)		1428			1385	1583	293	1863	1583	155	1858	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	16	5	0	210	0	677	11	925	237	500	914	16
RTOR Reduction (vph)	0	0	0	0	0	307	0	0	139	0	0	0
Lane Group Flow (vph)	0	21	0	0	210	370	11	925	98	500	930	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8	6		6	2		
Actuated Green, G (s)		24.0			24.0	24.0	45.0	43.0	43.0	68.0	61.0	
Effective Green, g (s)		24.0			24.0	24.0	45.0	43.0	43.0	68.0	61.0	
Actuated g/C Ratio		0.23			0.23	0.23	0.43	0.41	0.41	0.65	0.59	
Clearance Time (s)		6.0			6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	4.0	6.0	6.0	4.0	6.0	
Lane Grp Cap (vph)		329			319	365	155	770	654	411	1089	
v/s Ratio Prot							0.00	0.50		c0.23	0.50	
v/s Ratio Perm		0.01			0.15	c0.23	0.03		0.06	c0.56		
v/c Ratio		0.06			0.66	1.01	0.07	1.20	0.15	1.22	0.85	
Uniform Delay, d1		31.2			36.3	40.0	19.2	30.5	19.1	33.6	17.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1			4.8	50.7	0.3	102.9	0.5	117.8	8.5	
Delay (s)		31.3			41.1	90.7	19.5	133.4	19.6	151.4	26.3	
Level of Service		C			D	F	B	F	B	F	C	
Approach Delay (s)		31.3			78.9			109.3			70.1	
Approach LOS		C			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	85.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	105.1%	ICU Level of Service	G
Analysis Period (min)	15		

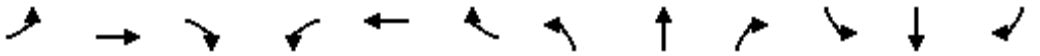
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	15	25	0	20	10	1420	30	45	1240	15
Future Volume (vph)	45	0	15	25	0	20	10	1420	30	45	1240	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0			8.0		5.0	10.0	10.0	5.0	10.0	
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.97			0.94		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1735			1703		1770	1863	1583	1770	1860	
Flt Permitted		0.75			0.86		0.07	1.00	1.00	0.06	1.00	
Satd. Flow (perm)		1348			1500		129	1863	1583	121	1860	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	46	0	15	26	0	21	10	1464	31	46	1278	15
RTOR Reduction (vph)	0	58	0	0	44	0	0	0	14	0	0	0
Lane Group Flow (vph)	0	3	0	0	3	0	10	1464	17	46	1293	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			3		1	6		5	2	
Permitted Phases	4			3			6		6	2		
Actuated Green, G (s)		5.7			5.7		58.7	57.6	57.6	66.9	61.7	
Effective Green, g (s)		5.7			5.7		58.7	57.6	57.6	66.9	61.7	
Actuated g/C Ratio		0.05			0.05		0.56	0.55	0.55	0.64	0.59	
Clearance Time (s)		8.0			8.0		5.0	10.0	10.0	5.0	10.0	
Vehicle Extension (s)		5.0			5.0		3.0	4.0	4.0	3.0	4.0	
Lane Grp Cap (vph)		73			81		89	1020	866	158	1090	
v/s Ratio Prot							0.00	c0.79		c0.01	c0.70	
v/s Ratio Perm		c0.00			c0.00		0.06		0.01	0.17		
v/c Ratio		0.05			0.03		0.11	1.44	0.02	0.29	1.19	
Uniform Delay, d1		47.2			47.1		24.1	23.8	10.9	23.4	21.8	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5			0.3		0.6	201.5	0.0	1.0	93.3	
Delay (s)		47.7			47.5		24.6	225.3	10.9	24.4	115.0	
Level of Service		D			D		C	F	B	C	F	
Approach Delay (s)		47.7			47.5			219.6			111.9	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	164.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	105.2	Sum of lost time (s)	31.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		

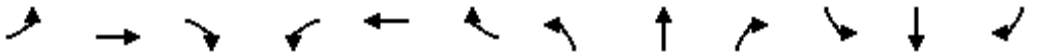
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	55	230	155	45	195	180	1215	90	165	915	165
Future Volume (vph)	85	55	230	155	45	195	180	1215	90	165	915	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0	6.0	3.0	4.0	4.0	3.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91	1.00	0.97	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1808	1583		1793	1583	1770	5085	1583	3433	3458	
Flt Permitted		0.55	1.00		0.58	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1025	1583		1085	1583	1770	5085	1583	3433	3458	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	90	59	245	165	48	207	191	1293	96	176	973	176
RTOR Reduction (vph)	0	0	181	0	0	153	0	0	57	0	9	0
Lane Group Flow (vph)	0	149	64	0	213	54	191	1293	39	176	1140	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8			6			
Actuated Green, G (s)		39.0	39.0		39.0	39.0	21.5	59.0	59.0	35.0	72.5	
Effective Green, g (s)		41.0	39.0		41.0	39.0	23.5	61.0	61.0	37.0	74.5	
Actuated g/C Ratio		0.27	0.26		0.27	0.26	0.16	0.41	0.41	0.25	0.50	
Clearance Time (s)		6.0	6.0		6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)		280	411		296	411	277	2067	643	846	1717	
v/s Ratio Prot							c0.11	0.25		0.05	c0.33	
v/s Ratio Perm		0.15	0.04		c0.20	0.03			0.02			
v/c Ratio		0.53	0.15		0.72	0.13	0.69	0.63	0.06	0.21	0.66	
Uniform Delay, d1		46.3	42.8		49.3	42.5	59.8	35.4	27.1	44.9	28.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.34	0.41	
Incremental Delay, d2		7.1	0.8		14.0	0.7	7.0	1.4	0.2	0.5	1.8	
Delay (s)		53.4	43.6		63.3	43.2	66.8	36.9	27.3	60.5	13.2	
Level of Service		D	D		E	D	E	D	C	E	B	
Approach Delay (s)		47.3			53.4			39.9			19.5	
Approach LOS		D			D			D			B	

Intersection Summary			
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

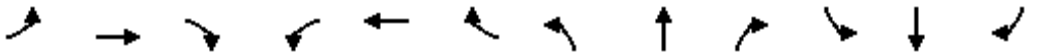
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	470	285	100	450	465	525	90	675	360	535	810	1010
Future Volume (vph)	470	285	100	450	465	525	90	675	360	535	810	1010
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5
Lane Util. Factor	0.94	0.95		0.97	1.00	1.00	1.00	0.91	1.00	0.94	0.95	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	4990	3402		3433	1863	1583	1770	5085	1583	4990	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	4990	3402		3433	1863	1583	1770	5085	1583	4990	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	495	300	105	474	489	553	95	711	379	563	853	1063
RTOR Reduction (vph)	0	26	0	0	0	0	0	0	232	0	0	326
Lane Group Flow (vph)	495	379	0	474	489	553	95	711	147	563	853	737
Turn Type	Split	NA		Split	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases						Free			6			2
Actuated Green, G (s)	22.4	22.4		25.0	25.0	150.0	13.7	56.2	56.2	23.4	65.9	65.9
Effective Green, g (s)	24.4	24.4		27.0	27.0	150.0	14.7	58.2	58.2	24.4	67.4	67.4
Actuated g/C Ratio	0.16	0.16		0.18	0.18	1.00	0.10	0.39	0.39	0.16	0.45	0.45
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	811	553		617	335	1583	173	1972	614	811	1590	711
v/s Ratio Prot	0.10	c0.11		0.14	c0.26		0.05	0.14		c0.11	0.24	
v/s Ratio Perm						0.35			0.09			c0.47
v/c Ratio	0.61	0.69		0.77	1.46	0.35	0.55	0.36	0.24	0.69	0.54	1.04
Uniform Delay, d1	58.4	59.2		58.5	61.5	0.0	64.5	32.7	31.0	59.3	30.0	41.3
Progression Factor	1.00	1.00		1.10	1.11	1.00	1.00	1.00	1.00	1.29	0.40	0.89
Incremental Delay, d2	1.2	3.2		4.5	219.9	0.5	3.5	0.5	0.9	2.0	1.0	39.6
Delay (s)	59.5	62.4		68.9	287.9	0.5	68.0	33.2	31.9	78.3	13.1	76.3
Level of Service	E	E		E	F	A	E	C	C	E	B	E
Approach Delay (s)		60.8			114.6			35.6			55.0	
Approach LOS		E			F			D			E	

Intersection Summary			
HCM 2000 Control Delay	66.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		

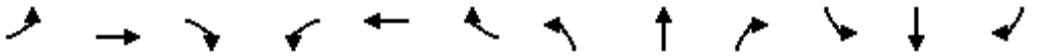
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	615	260	110	0	0	0	0	1010	660	65	2265	1395
Future Volume (vph)	615	260	110	0	0	0	0	1010	660	65	2265	1395
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5					4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00					0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583					5085	1583	3433	5085	1583
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583					5085	1583	3433	5085	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	634	268	113	0	0	0	0	1041	680	67	2335	1438
RTOR Reduction (vph)	0	0	49	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	634	268	64	0	0	0	0	1041	680	67	2335	1438
Turn Type	Perm	NA	Perm					NA	Free	Prot	NA	Free
Protected Phases		4						6		5	2	
Permitted Phases	4		4						Free			Free
Actuated Green, G (s)	34.8	34.8	34.8					90.0	150.0	6.7	102.7	150.0
Effective Green, g (s)	36.8	36.8	36.8					92.0	150.0	7.7	104.7	150.0
Actuated g/C Ratio	0.25	0.25	0.25					0.61	1.00	0.05	0.70	1.00
Clearance Time (s)	6.5	6.5	6.5					6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					5.0		2.5	5.0	
Lane Grp Cap (vph)	842	457	388					3118	1583	176	3549	1583
v/s Ratio Prot		0.14						0.20		0.02	0.46	
v/s Ratio Perm	0.18		0.04						0.43			c0.91
v/c Ratio	0.75	0.59	0.16					0.33	0.43	0.38	0.66	0.91
Uniform Delay, d1	52.4	49.9	44.5					14.1	0.0	68.8	12.6	0.0
Progression Factor	1.00	1.00	1.00					0.41	1.00	1.25	0.31	1.00
Incremental Delay, d2	3.8	1.9	0.2					0.3	0.8	1.0	0.9	9.2
Delay (s)	56.2	51.8	44.7					6.0	0.8	87.1	4.9	9.2
Level of Service	E	D	D					A	A	F	A	A
Approach Delay (s)		53.8			0.0			4.0			7.9	
Approach LOS		D			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

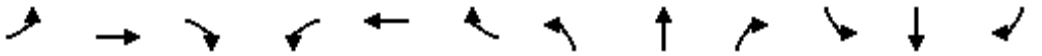
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	840	0	40	1190	575	0	0	540	365
Future Volume (vph)	0	0	0	840	0	40	1190	575	0	0	540	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	3.5			4.0	4.0
Lane Util. Factor				0.91	0.91	1.00	0.97	0.91			0.91	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3221	1610	1583	3433	5085			5085	1583
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				3221	1610	1583	3433	5085			5085	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	923	0	44	1308	632	0	0	593	401
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	618	305	44	1308	632	0	0	593	401
Turn Type				custom	NA	Free	Prot	NA			NA	Free
Protected Phases				4			1	6			2	
Permitted Phases				4		Free						Free
Actuated Green, G (s)				34.9	34.9	150.0	75.1	103.6			22.0	150.0
Effective Green, g (s)				36.9	34.9	150.0	77.1	105.6			24.0	150.0
Actuated g/C Ratio				0.25	0.23	1.00	0.51	0.70			0.16	1.00
Clearance Time (s)				6.0			6.0	5.5			6.0	
Vehicle Extension (s)				3.0			3.5	5.0			5.0	
Lane Grp Cap (vph)				792	374	1583	1764	3579			813	1583
v/s Ratio Prot				c0.19	0.19		c0.38	0.12			c0.12	
v/s Ratio Perm						0.03						0.25
v/c Ratio				0.78	0.82	0.03	0.74	0.18			0.73	0.25
Uniform Delay, d1				52.8	54.5	0.0	28.6	7.5			59.9	0.0
Progression Factor				1.00	1.00	1.00	0.70	0.68			1.00	1.00
Incremental Delay, d2				5.0	12.8	0.0	2.7	0.1			4.0	0.4
Delay (s)				57.8	67.3	0.0	22.6	5.2			64.0	0.4
Level of Service				E	E	A	C	A			E	A
Approach Delay (s)		0.0			58.2			17.0			38.3	
Approach LOS		A			E			B			D	

Intersection Summary			
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

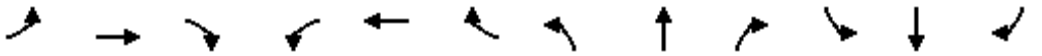


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	60	245	395	40	0	110	235	285	20	260	5
Future Volume (vph)	5	60	245	395	40	0	110	235	285	20	260	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0	6.0	5.0	4.0		4.0	4.5	5.0	4.0	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1863		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	3433	1863		3433	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	63	258	416	42	0	116	247	300	21	274	5
RTOR Reduction (vph)	0	0	236	0	0	0	0	0	85	0	0	3
Lane Group Flow (vph)	5	63	22	416	42	0	116	247	215	21	274	2
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6	3	5	2	
Permitted Phases			4						6			2
Actuated Green, G (s)	10.2	10.2	10.2	21.2	21.2		9.5	63.9	85.1	3.1	57.5	57.5
Effective Green, g (s)	11.2	12.2	10.2	22.2	23.2		10.5	65.4	87.1	4.1	59.0	57.5
Actuated g/C Ratio	0.09	0.10	0.08	0.18	0.19		0.09	0.54	0.72	0.03	0.49	0.47
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.5	3.5		3.0	5.0	3.5	3.0	5.0	5.0
Lane Grp Cap (vph)	163	187	133	627	356		296	1906	1200	59	1719	749
v/s Ratio Prot	0.00	c0.03		c0.12	0.02		c0.03	0.07	c0.03	0.01	0.08	
v/s Ratio Perm			0.01						0.10			0.00
v/c Ratio	0.03	0.34	0.16	0.66	0.12		0.39	0.13	0.18	0.36	0.16	0.00
Uniform Delay, d1	50.2	50.8	51.6	46.1	40.6		52.4	13.9	5.6	57.4	17.4	16.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	1.1	0.6	2.8	0.2		0.9	0.1	0.1	3.7	0.2	0.0
Delay (s)	50.2	51.9	52.2	48.9	40.8		53.3	14.0	5.6	61.0	17.6	16.9
Level of Service	D	D	D	D	D		D	B	A	E	B	B
Approach Delay (s)		52.1			48.1			17.1			20.6	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	32.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	121.4	Sum of lost time (s)	18.5
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

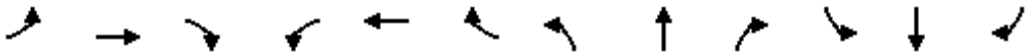
2040 Build Alternative 1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	1235	545	225	2205	275	285	100	75	450	510	1015
Future Volume (vph)	240	1235	545	225	2205	275	285	100	75	450	510	1015
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	4.0	4.0	5.5	4.5	4.0	4.0	4.0	4.5	5.5	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	3539	1583	3433	3539	2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3433	3539	1583	3433	3539	2787
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	1342	592	245	2397	299	310	109	82	489	554	1103
RTOR Reduction (vph)	0	0	0	0	0	62	0	0	67	0	0	0
Lane Group Flow (vph)	261	1342	592	245	2397	237	310	109	15	489	554	1103
Turn Type	Prot	NA	Free	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	1	7	4	5
Permitted Phases			Free			6			8			4
Actuated Green, G (s)	27.0	80.3	150.0	15.2	68.5	92.7	13.0	12.3	27.5	24.2	22.5	49.5
Effective Green, g (s)	27.0	80.3	150.0	15.2	68.5	92.7	13.0	12.3	27.5	24.2	22.5	49.5
Actuated g/C Ratio	0.18	0.54	1.00	0.10	0.46	0.62	0.09	0.08	0.18	0.16	0.15	0.33
Clearance Time (s)	4.0	5.5		4.0	5.5	4.5	4.0	4.0	4.0	4.5	5.5	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0	3.0	3.0	3.0	3.0	5.0	3.0
Lane Grp Cap (vph)	617	2722	1583	347	2322	978	297	290	332	553	530	919
v/s Ratio Prot	0.08	0.26		0.07	c0.47	0.04	c0.09	0.03	0.00	0.14	0.16	c0.22
v/s Ratio Perm			0.37			0.11			0.00			0.18
v/c Ratio	0.42	0.49	0.37	0.71	1.03	0.24	1.04	0.38	0.05	0.88	1.05	1.20
Uniform Delay, d1	54.6	22.0	0.0	65.2	40.8	12.9	68.5	65.2	50.4	61.5	63.8	50.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.6	0.7	6.4	27.6	0.1	64.1	0.8	0.1	15.5	51.4	100.6
Delay (s)	55.1	22.6	0.7	71.7	68.3	13.0	132.6	66.0	50.5	77.0	115.2	150.9
Level of Service	E	C	A	E	E	B	F	E	D	E	F	F
Approach Delay (s)		20.6			63.0			104.7			124.8	
Approach LOS		C			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	70.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	97.5%	ICU Level of Service	F
Analysis Period (min)	15		

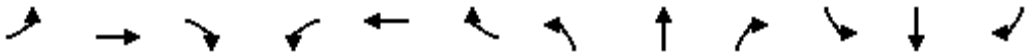
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	90	70	0	55	25	590	15	15	1930	20
Future Volume (vph)	0	0	90	70	0	55	25	590	15	15	1930	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.86			0.94		1.00	1.00		1.00	1.00	
Flt Protected		1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1611			1704		1770	3526		1770	3534	
Flt Permitted		1.00			0.70		0.05	1.00		0.38	1.00	
Satd. Flow (perm)		1611			1222		95	3526		708	3534	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	0	103	80	0	63	29	678	17	17	2218	23
RTOR Reduction (vph)	0	14	0	0	30	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	89	0	0	113	0	29	694	0	17	2240	0
Turn Type		NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.4			13.4		78.6	78.6		78.6	78.6	
Effective Green, g (s)		13.4			13.4		78.6	78.6		78.6	78.6	
Actuated g/C Ratio		0.13			0.13		0.79	0.79		0.79	0.79	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		215			163		74	2771		556	2777	
v/s Ratio Prot		0.06						0.20			c0.63	
v/s Ratio Perm					c0.09		0.31			0.02		
v/c Ratio		0.41			0.69		0.39	0.25		0.03	0.81	
Uniform Delay, d1		39.7			41.3		3.3	2.9		2.3	6.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.3			11.9		14.9	0.2		0.1	2.6	
Delay (s)		41.0			53.3		18.2	3.1		2.4	8.9	
Level of Service		D			D		B	A		A	A	
Approach Delay (s)		41.0			53.3			3.7			8.8	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

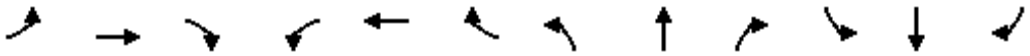
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	5	10	645	5	735	10	590	105	175	1210	5
Future Volume (vph)	20	5	10	645	5	735	10	590	105	175	1210	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	5.0	6.0	6.0	6.0	5.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		0.96			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.97			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1739			1775	1583	1770	3539	1583	3433	3537	
Flt Permitted		0.56			0.66	1.00	0.12	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1001			1226	1583	225	3539	1583	3433	3537	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	21	5	11	686	5	782	11	628	112	186	1287	5
RTOR Reduction (vph)	0	11	0	0	0	11	0	0	40	0	0	0
Lane Group Flow (vph)	0	26	0	0	691	771	11	628	72	186	1292	0
Turn Type	Perm	NA		pm+pt	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	
Protected Phases		4		3	8	1		2	3	1	6	
Permitted Phases	4			8		8	2		2			
Actuated Green, G (s)		5.6			58.2	74.9	34.3	34.3	80.9	16.7	56.0	
Effective Green, g (s)		5.6			58.2	74.9	34.3	34.3	80.9	16.7	56.0	
Actuated g/C Ratio		0.04			0.46	0.59	0.27	0.27	0.64	0.13	0.44	
Clearance Time (s)		6.0			6.0	5.0	6.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0			4.0	4.0	6.0	6.0	3.0	4.0	6.0	
Lane Grp Cap (vph)		44			768	939	61	961	1090	454	1569	
v/s Ratio Prot					c0.33	0.11		0.18	0.02	0.05	c0.37	
v/s Ratio Perm		0.03			c0.08	0.38	0.05		0.02			
v/c Ratio		0.60			0.90	0.82	0.18	0.65	0.07	0.41	0.82	
Uniform Delay, d1		59.2			31.3	20.3	35.2	40.7	8.5	50.2	30.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		21.0			13.7	6.1	6.4	3.5	0.0	0.8	5.0	
Delay (s)		80.2			45.0	26.5	41.6	44.1	8.5	51.1	35.8	
Level of Service		F			D	C	D	D	A	D	D	
Approach Delay (s)		80.2			35.2			38.8			37.7	
Approach LOS		F			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	37.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	126.2	Sum of lost time (s)	23.0
Intersection Capacity Utilization	107.9%	ICU Level of Service	G
Analysis Period (min)	15		

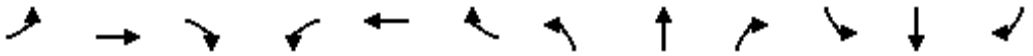
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	35	45	0	15	35	1195	80	15	1230	15
Future Volume (vph)	55	0	35	45	0	15	35	1195	80	15	1230	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0			8.0		4.0	10.0		4.0	10.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.95			0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.97			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1713			1734		1770	3506		1770	3533	
Flt Permitted		0.97			0.96		0.13	1.00		0.13	1.00	
Satd. Flow (perm)		1713			1734		246	3506		242	3533	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	0	37	47	0	16	37	1258	84	16	1295	16
RTOR Reduction (vph)	0	89	0	0	59	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	6	0	0	4	0	37	1338	0	16	1311	0
Turn Type	Split	NA		Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases							6			2		
Actuated Green, G (s)		5.7			5.7		50.1	47.9		48.7	47.2	
Effective Green, g (s)		5.7			5.7		50.1	47.9		48.7	47.2	
Actuated g/C Ratio		0.06			0.06		0.55	0.53		0.54	0.52	
Clearance Time (s)		8.0			8.0		4.0	10.0		4.0	10.0	
Vehicle Extension (s)		5.0			5.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		107			108		172	1849		155	1836	
v/s Ratio Prot		c0.00			c0.00		c0.01	c0.38		0.00	0.37	
v/s Ratio Perm							0.11			0.05		
v/c Ratio		0.06			0.04		0.22	0.72		0.10	0.71	
Uniform Delay, d1		40.0			40.0		11.2	16.4		11.5	16.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5			0.3		0.6	2.5		0.3	2.4	
Delay (s)		40.5			40.3		11.9	18.9		11.8	19.0	
Level of Service		D			D		B	B		B	B	
Approach Delay (s)		40.5			40.3			18.7			19.0	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.8	Sum of lost time (s)	30.0
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

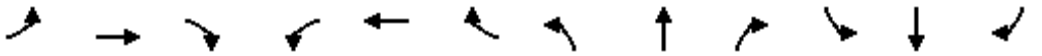
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	25	75	250	30	355	130	1165	120	445	750	95
Future Volume (vph)	45	25	75	250	30	355	130	1165	120	445	750	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	3.0		2.0	3.0	4.0	4.0	6.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91	1.00	0.97	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1805	1583		1783	1583	1770	5085	1583	3433	3480	
Flt Permitted		0.55	1.00		0.70	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1028	1583		1295	1583	1770	5085	1583	3433	3480	
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)	49	27	82	272	33	386	141	1266	130	484	815	103
RTOR Reduction (vph)	0	0	43	0	0	12	0	0	81	0	7	0
Lane Group Flow (vph)	0	76	39	0	305	374	141	1266	49	484	911	0
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA	
Protected Phases		4	1		8	5	1	6		5	2	
Permitted Phases	4		4	8		8			6			
Actuated Green, G (s)		30.9	44.4		32.9	55.3	13.5	42.2	42.2	22.4	51.1	
Effective Green, g (s)		32.9	48.4		34.9	59.3	14.5	44.2	42.2	23.4	53.1	
Actuated g/C Ratio		0.29	0.43		0.31	0.53	0.13	0.39	0.38	0.21	0.47	
Clearance Time (s)		6.0	5.0		4.0	5.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	5.0	3.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)		300	681		401	834	228	1997	593	714	1642	
v/s Ratio Prot			0.01			0.10	0.08	c0.25		c0.14	0.26	
v/s Ratio Perm		0.07	0.02		c0.24	0.14			0.03			
v/c Ratio		0.25	0.06		0.76	0.45	0.62	0.63	0.08	0.68	0.55	
Uniform Delay, d1		30.4	18.7		35.0	16.5	46.4	27.6	22.7	41.1	21.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4	0.0		8.3	0.8	4.9	1.5	0.3	3.3	1.4	
Delay (s)		30.9	18.8		43.3	17.3	51.3	29.2	22.9	44.4	22.6	
Level of Service		C	B		D	B	D	C	C	D	C	
Approach Delay (s)		24.6			28.8			30.7			30.1	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	112.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

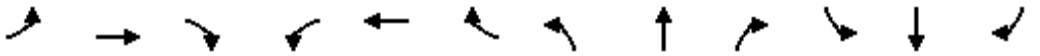
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	110	10	185	130	1075	25	255	170	885	455	240
Future Volume (vph)	100	110	10	185	130	1075	25	255	170	885	455	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5
Lane Util. Factor	0.94	0.95		0.97	1.00	1.00	1.00	0.91	1.00	0.94	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	4990	3493		3433	1863	1583	1770	5085	1583	4990	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	4990	3493		3433	1863	1583	1770	5085	1583	4990	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	116	11	195	137	1132	26	268	179	932	479	253
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	118	0	0	117
Lane Group Flow (vph)	105	121	0	195	137	1132	26	268	61	932	479	136
Turn Type	Split	NA		Split	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases						Free			6			2
Actuated Green, G (s)	8.9	8.9		12.0	12.0	100.1	3.9	32.0	32.0	24.2	52.3	52.3
Effective Green, g (s)	10.9	10.9		14.0	14.0	100.1	4.9	34.0	34.0	25.2	53.8	53.8
Actuated g/C Ratio	0.11	0.11		0.14	0.14	1.00	0.05	0.34	0.34	0.25	0.54	0.54
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	543	380		480	260	1583	86	1727	537	1256	1902	850
v/s Ratio Prot	0.02	0.03		0.06	0.07		0.01	0.05		0.19	0.14	
v/s Ratio Perm						c0.71			0.04			0.09
v/c Ratio	0.19	0.32		0.41	0.53	0.72	0.30	0.16	0.11	0.74	0.25	0.16
Uniform Delay, d1	40.6	41.2		39.3	40.0	0.0	45.9	23.0	22.7	34.5	12.4	11.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.4		0.4	1.5	2.8	2.0	0.2	0.4	2.4	0.3	0.4
Delay (s)	40.7	41.5		39.7	41.4	2.8	47.9	23.2	23.1	36.9	12.7	12.1
Level of Service	D	D		D	D	A	D	C	C	D	B	B
Approach Delay (s)		41.2			11.3			24.5			26.1	
Approach LOS		D			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.1	Sum of lost time (s)	16.5
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

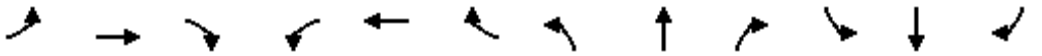
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	20	20	0	0	0	0	1020	310	60	1520	220
Future Volume (vph)	130	20	20	0	0	0	0	1020	310	60	1520	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5					4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00					0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583					5085	1583	3433	5085	1583
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583					5085	1583	3433	5085	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	21	21	0	0	0	0	1074	337	65	1652	239
RTOR Reduction (vph)	0	0	19	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	137	21	2	0	0	0	0	1074	337	65	1652	239
Turn Type	Perm	NA	Perm					NA	Free	Prot	NA	Free
Protected Phases		4						6		5	2	
Permitted Phases	4		4						Free			Free
Actuated Green, G (s)	9.9	9.9	9.9					78.3	112.6	5.9	90.2	112.6
Effective Green, g (s)	11.9	11.9	11.9					80.3	112.6	6.9	92.2	112.6
Actuated g/C Ratio	0.11	0.11	0.11					0.71	1.00	0.06	0.82	1.00
Clearance Time (s)	6.5	6.5	6.5					6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					5.0		2.5	5.0	
Lane Grp Cap (vph)	362	196	167					3626	1583	210	4163	1583
v/s Ratio Prot		0.01						0.21		0.02	c0.32	
v/s Ratio Perm	c0.04		0.00						0.21			0.15
v/c Ratio	0.38	0.11	0.01					0.30	0.21	0.31	0.40	0.15
Uniform Delay, d1	46.9	45.5	45.1					5.9	0.0	50.6	2.7	0.0
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2	0.0					0.2	0.3	0.6	0.3	0.2
Delay (s)	47.6	45.8	45.1					6.1	0.3	51.2	3.0	0.2
Level of Service	D	D	D					A	A	D	A	A
Approach Delay (s)		47.1			0.0			4.7			4.3	
Approach LOS		D			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	112.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

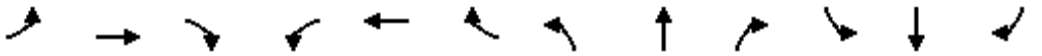
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	410	0	60	750	1250	0	0	575	830
Future Volume (vph)	0	0	0	410	0	60	750	1250	0	0	575	830
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	3.5			4.0	4.0
Lane Util. Factor				0.91	0.91	1.00	0.97	0.91			0.91	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3221	1610	1583	3433	5085			5085	1583
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				3221	1610	1583	3433	5085			5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	456	0	67	833	1389	0	0	639	922
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	306	150	67	833	1389	0	0	639	922
Turn Type				custom	NA	Free	Prot	NA			NA	Free
Protected Phases				4			1	6			2	
Permitted Phases				4		Free						Free
Actuated Green, G (s)				13.9	13.9	77.6	25.4	52.2			20.3	77.6
Effective Green, g (s)				15.9	13.9	77.6	27.4	54.2			22.3	77.6
Actuated g/C Ratio				0.20	0.18	1.00	0.35	0.70			0.29	1.00
Clearance Time (s)				6.0			6.0	5.5			6.0	
Vehicle Extension (s)				3.0			3.0	3.0			3.0	
Lane Grp Cap (vph)				659	288	1583	1212	3551			1461	1583
v/s Ratio Prot				0.10	0.09		c0.24	0.27			0.13	
v/s Ratio Perm						0.04						c0.58
v/c Ratio				0.46	0.52	0.04	0.69	0.39			0.44	0.58
Uniform Delay, d1				27.1	28.8	0.0	21.4	4.9			22.5	0.0
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				0.5	1.7	0.1	1.6	0.1			0.2	1.6
Delay (s)				27.6	30.5	0.1	23.1	4.9			22.7	1.6
Level of Service				C	C	A	C	A			C	A
Approach Delay (s)		0.0			24.9			11.7			10.2	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	77.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

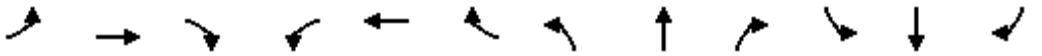
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	100	265	815	290	20	260	630	445	25	310	30
Future Volume (vph)	40	100	265	815	290	20	260	630	445	25	310	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0	6.0	5.0	4.0		4.0	4.0	5.0	4.0	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1845		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	3433	1845		3433	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	43	106	282	867	309	21	277	670	473	27	330	32
RTOR Reduction (vph)	0	0	250	0	1	0	0	0	159	0	0	25
Lane Group Flow (vph)	43	106	32	867	329	0	277	670	314	27	330	7
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6	3	5	2	
Permitted Phases			4						6			2
Actuated Green, G (s)	12.4	12.4	12.4	37.4	37.4		14.1	35.0	72.4	4.6	25.0	25.0
Effective Green, g (s)	13.4	14.4	12.4	38.4	39.4		15.1	36.5	74.4	5.6	26.5	25.0
Actuated g/C Ratio	0.12	0.13	0.11	0.34	0.35		0.13	0.33	0.66	0.05	0.24	0.22
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		5.0	5.5	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	211	239	175	1178	649		463	1154	1052	88	838	353
v/s Ratio Prot	0.02	c0.06		c0.25	0.18		c0.08	c0.19	0.10	0.02	0.09	
v/s Ratio Perm			0.02						0.10			0.00
v/c Ratio	0.20	0.44	0.18	0.74	0.51		0.60	0.58	0.30	0.31	0.39	0.02
Uniform Delay, d1	44.4	45.0	45.2	32.3	28.6		45.5	31.3	7.8	51.3	35.9	33.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	1.3	0.5	2.4	0.6		2.1	0.7	0.2	2.0	0.3	0.0
Delay (s)	44.9	46.4	45.7	34.7	29.2		47.6	32.1	8.0	53.3	36.2	33.9
Level of Service	D	D	D	C	C		D	C	A	D	D	C
Approach Delay (s)		45.8			33.2			27.1			37.2	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	111.9	Sum of lost time (s)	18.5
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

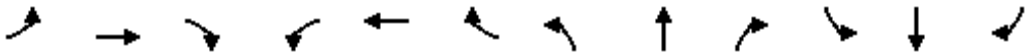
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1125	2445	170	145	1640	630	460	475	235	595	160	435
Future Volume (vph)	1125	2445	170	145	1640	630	460	475	235	595	160	435
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	4.0	4.5	5.5	4.0	4.0	4.5	4.5	4.0	5.5	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	3539	1583	3433	3539	2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3433	3539	1583	3433	3539	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1184	2574	179	153	1726	663	484	500	247	626	168	458
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	63	0	0	0
Lane Group Flow (vph)	1184	2574	179	153	1726	663	484	500	184	626	168	458
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8	1	7	4	5
Permitted Phases			Free			Free			8			4
Actuated Green, G (s)	43.0	82.0	150.0	8.0	47.5	150.0	20.0	18.5	26.5	23.0	20.5	63.5
Effective Green, g (s)	43.0	82.0	150.0	8.0	47.5	150.0	20.0	18.5	26.5	23.0	20.5	63.5
Actuated g/C Ratio	0.29	0.55	1.00	0.05	0.32	1.00	0.13	0.12	0.18	0.15	0.14	0.42
Clearance Time (s)	4.0	5.5		4.5	5.5		4.0	4.5	4.5	4.0	5.5	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	3.0	3.0	3.0	5.0	3.0
Lane Grp Cap (vph)	984	2779	1583	183	1610	1583	457	436	327	526	483	1179
v/s Ratio Prot	c0.34	0.51		0.04	c0.34		0.14	c0.14	0.03	c0.18	0.05	0.11
v/s Ratio Perm			0.11			c0.42			0.09			0.05
v/c Ratio	1.20	0.93	0.11	0.84	1.07	0.42	1.06	1.15	0.56	1.19	0.35	0.39
Uniform Delay, d1	53.5	31.2	0.0	70.4	51.2	0.0	65.0	65.8	56.5	63.5	58.7	29.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	101.2	6.8	0.1	26.8	44.5	0.8	58.6	89.8	2.2	103.3	2.0	0.2
Delay (s)	154.7	38.0	0.1	97.1	95.8	0.8	123.6	155.5	58.7	166.8	60.7	30.1
Level of Service	F	D	A	F	F	A	F	F	E	F	E	C
Approach Delay (s)		71.4			71.1			123.6			102.5	
Approach LOS		E			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	82.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	109.4%	ICU Level of Service	H
Analysis Period (min)	15		

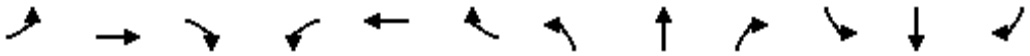
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	0	45	30	0	30	115	2005	190	65	1130	65
Future Volume (vph)	20	0	45	30	0	30	115	2005	190	65	1130	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.91			0.93		1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1663			1695		1770	3493		1770	3510	
Flt Permitted		0.86			0.71		0.22	1.00		0.07	1.00	
Satd. Flow (perm)		1446			1236		418	3493		123	3510	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	20	0	45	30	0	30	116	2025	192	66	1141	66
RTOR Reduction (vph)	0	43	0	0	28	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	23	0	0	32	0	116	2214	0	66	1205	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.5			7.5		119.5	119.5		119.5	119.5	
Effective Green, g (s)		7.5			7.5		119.5	119.5		119.5	119.5	
Actuated g/C Ratio		0.06			0.06		0.89	0.89		0.89	0.89	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		80			68		370	3091		108	3107	
v/s Ratio Prot								c0.63			0.34	
v/s Ratio Perm		0.02			c0.03		0.28			0.54		
v/c Ratio		0.28			0.47		0.31	0.72		0.61	0.39	
Uniform Delay, d1		61.2			61.8		1.2	2.4		1.9	1.4	
Progression Factor		1.00			1.00		1.00	1.00		2.37	0.77	
Incremental Delay, d2		1.9			5.0		2.2	1.5		19.3	0.3	
Delay (s)		63.1			66.8		3.4	3.9		23.9	1.3	
Level of Service		E			E		A	A		C	A	
Approach Delay (s)		63.1			66.8			3.9			2.5	
Approach LOS		E			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		

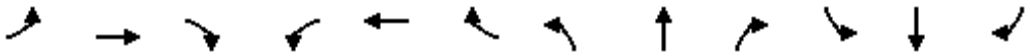
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	5	0	195	5	630	10	1360	705	770	1360	30
Future Volume (vph)	20	5	0	195	5	630	10	1360	705	770	1360	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	5.0	4.0	6.0	4.0	5.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.96			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1790			1776	1583	1770	3539	1583	3433	3528	
Flt Permitted		0.86			0.78	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1603			1445	1583	1770	3539	1583	3433	3528	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	21	5	0	203	5	656	10	1417	734	802	1417	31
RTOR Reduction (vph)	0	0	0	0	0	13	0	0	88	0	1	0
Lane Group Flow (vph)	0	26	0	0	208	643	10	1417	646	802	1447	0
Turn Type	Perm	NA		pm+pt	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases		4		3	8	1	5	2	3	1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)		4.2			26.7	61.6	1.6	56.4	74.9	34.9	90.7	
Effective Green, g (s)		4.2			26.7	61.6	1.6	56.4	74.9	34.9	90.7	
Actuated g/C Ratio		0.03			0.20	0.46	0.01	0.42	0.55	0.26	0.67	
Clearance Time (s)		6.0			6.0	5.0	4.0	6.0	4.0	5.0	6.0	
Vehicle Extension (s)		3.0			3.0	4.0	3.0	6.0	3.0	4.0	6.0	
Lane Grp Cap (vph)		49			331	722	20	1478	878	887	2370	
v/s Ratio Prot					0.09	c0.23	0.01	c0.40	0.10	c0.23	0.41	
v/s Ratio Perm		0.02			0.04	0.18			0.31			
v/c Ratio		0.53			0.63	0.89	0.50	0.96	0.74	0.90	0.61	
Uniform Delay, d1		64.4			49.6	33.6	66.3	38.2	22.6	48.4	12.3	
Progression Factor		1.00			1.00	1.00	0.98	1.25	1.20	0.88	0.64	
Incremental Delay, d2		10.6			3.7	13.5	13.8	12.5	2.4	6.7	0.6	
Delay (s)		75.0			53.3	47.1	78.5	60.4	29.6	49.2	8.4	
Level of Service		E			D	D	E	E	C	D	A	
Approach Delay (s)		75.0			48.6			50.0			23.0	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		

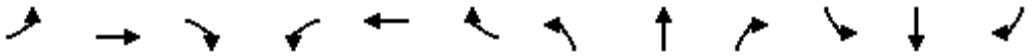
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	5	15	155	0	30	75	1775	70	75	1890	80
Future Volume (vph)	25	5	15	155	0	30	75	1775	70	75	1890	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0			8.0		5.0	10.0		5.0	10.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.95			0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1729			1748		1770	3519		1770	3518	
Flt Permitted		0.97			0.96		0.05	1.00		0.05	1.00	
Satd. Flow (perm)		1729			1748		89	3519		88	3518	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	5	16	163	0	32	79	1868	74	79	1989	84
RTOR Reduction (vph)	0	14	0	0	152	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	33	0	0	43	0	79	1940	0	79	2071	0
Turn Type	Split	NA		Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases							6			2		
Actuated Green, G (s)		5.8			8.6		88.9	83.7		90.3	84.4	
Effective Green, g (s)		5.8			8.6		88.9	83.7		90.3	84.4	
Actuated g/C Ratio		0.04			0.06		0.66	0.62		0.67	0.63	
Clearance Time (s)		8.0			8.0		5.0	10.0		5.0	10.0	
Vehicle Extension (s)		5.0			5.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		74			111		123	2181		132	2199	
v/s Ratio Prot		c0.02			c0.02		0.02	0.55		c0.03	c0.59	
v/s Ratio Perm							0.40			0.37		
v/c Ratio		0.44			0.39		0.64	0.89		0.60	0.94	
Uniform Delay, d1		63.0			60.7		28.5	21.7		25.1	23.1	
Progression Factor		1.00			1.00		1.26	1.14		1.31	0.97	
Incremental Delay, d2		8.5			4.7		4.9	2.8		3.7	5.5	
Delay (s)		71.6			65.4		40.8	27.6		36.6	28.0	
Level of Service		E			E		D	C		D	C	
Approach Delay (s)		71.6			65.4			28.1			28.3	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	92.6%	ICU Level of Service	F
Analysis Period (min)	15		

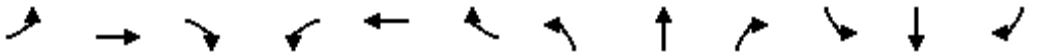
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	50	125	405	45	590	145	1290	345	470	1340	165
Future Volume (vph)	15	50	125	405	45	590	145	1290	345	470	1340	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	5.0		4.0	5.0	3.0	4.0	4.0	3.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91	1.00	0.97	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected		0.99	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1841	1583		1782	1583	1770	5085	1583	3433	3481	
Flt Permitted		0.79	1.00		0.70	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1466	1583		1300	1583	1770	5085	1583	3433	3481	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	53	132	426	47	621	153	1358	363	495	1411	174
RTOR Reduction (vph)	0	0	38	0	0	11	0	0	237	0	7	0
Lane Group Flow (vph)	0	69	94	0	473	610	153	1358	126	495	1578	0
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA	
Protected Phases		4	1		8	5	1	6		5	2	
Permitted Phases	4		4	8		8			6			
Actuated Green, G (s)		47.0	57.0		47.0	73.0	10.0	45.0	45.0	26.0	61.0	
Effective Green, g (s)		49.0	57.0		49.0	73.0	12.0	47.0	47.0	28.0	63.0	
Actuated g/C Ratio		0.36	0.42		0.36	0.54	0.09	0.35	0.35	0.21	0.47	
Clearance Time (s)		6.0	5.0		6.0	5.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	5.0	3.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)		532	668		471	855	157	1770	551	712	1624	
v/s Ratio Prot			0.01			0.14	c0.09	0.27		0.14	c0.45	
v/s Ratio Perm		0.05	0.05		c0.36	0.25			0.08			
v/c Ratio		0.13	0.14		1.00	0.71	0.97	0.77	0.23	0.70	0.97	
Uniform Delay, d1		28.7	24.0		43.0	23.2	61.3	39.1	31.2	49.5	35.1	
Progression Factor		1.00	1.00		1.00	1.00	1.23	0.49	1.61	1.29	0.42	
Incremental Delay, d2		0.5	0.1		42.5	5.0	42.2	1.6	0.5	4.8	15.1	
Delay (s)		29.2	24.1		85.5	28.2	118.0	20.7	50.5	68.9	29.9	
Level of Service		C	C		F	C	F	C	D	E	C	
Approach Delay (s)		25.8			53.0			34.4			39.2	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		

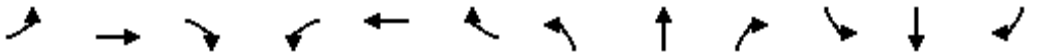
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	335	260	45	465	310	1040	60	680	450	1055	660	585
Future Volume (vph)	335	260	45	465	310	1040	60	680	450	1055	660	585
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5
Lane Util. Factor	0.94	0.95		0.97	1.00	1.00	1.00	0.91	1.00	0.94	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	4990	3461		3433	1863	1583	1770	5085	1583	4990	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	4990	3461		3433	1863	1583	1770	5085	1583	4990	3539	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	345	268	46	479	320	1072	62	701	464	1088	680	603
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	352	0	0	310
Lane Group Flow (vph)	345	301	0	479	320	1072	62	701	112	1088	680	293
Turn Type	Split	NA		Split	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases						Free			6			2
Actuated Green, G (s)	17.0	17.0		22.0	22.0	135.0	8.8	28.5	28.5	44.5	64.2	64.2
Effective Green, g (s)	19.0	19.0		24.0	24.0	135.0	9.8	30.5	30.5	45.5	65.7	65.7
Actuated g/C Ratio	0.14	0.14		0.18	0.18	1.00	0.07	0.23	0.23	0.34	0.49	0.49
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		3.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	702	487		610	331	1583	128	1148	357	1681	1722	770
v/s Ratio Prot	0.07	0.09		0.14	c0.17		0.04	0.14		0.22	0.19	
v/s Ratio Perm						c0.68			0.07			0.19
v/c Ratio	0.49	0.62		0.79	0.97	0.68	0.48	0.61	0.31	0.65	0.39	0.38
Uniform Delay, d1	53.5	54.6		53.0	55.1	0.0	60.2	46.9	43.5	37.9	22.0	21.8
Progression Factor	1.00	1.00		0.99	0.99	1.00	1.00	1.00	1.00	1.02	0.37	0.16
Incremental Delay, d2	0.4	2.0		4.3	31.7	1.6	2.9	2.4	2.3	1.0	0.6	1.2
Delay (s)	53.9	56.6		56.9	86.5	1.6	63.0	49.3	45.8	39.5	8.7	4.7
Level of Service	D	E		E	F	A	E	D	D	D	A	A
Approach Delay (s)		55.2			30.3			48.7			21.8	
Approach LOS		E			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		

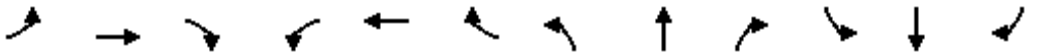
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	385	185	65	0	0	0	0	1200	805	95	2190	640
Future Volume (vph)	385	185	65	0	0	0	0	1200	805	95	2190	640
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5					4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00					0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583					5085	1583	3433	5085	1583
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583					5085	1583	3433	5085	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	405	195	68	0	0	0	0	1263	847	100	2305	674
RTOR Reduction (vph)	0	0	56	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	405	195	12	0	0	0	0	1263	847	100	2305	674
Turn Type	Perm	NA	Perm					NA	Free	Prot	NA	Free
Protected Phases		4						6		5	2	
Permitted Phases	4		4						Free			Free
Actuated Green, G (s)	21.8	21.8	21.8					85.9	135.0	8.8	100.7	135.0
Effective Green, g (s)	23.8	23.8	23.8					87.9	135.0	9.8	102.7	135.0
Actuated g/C Ratio	0.18	0.18	0.18					0.65	1.00	0.07	0.76	1.00
Clearance Time (s)	6.5	6.5	6.5					6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					5.0		2.5	5.0	
Lane Grp Cap (vph)	605	328	279					3310	1583	249	3868	1583
v/s Ratio Prot		0.10						0.25		0.03	c0.45	
v/s Ratio Perm	c0.12		0.01						c0.53			0.43
v/c Ratio	0.67	0.59	0.04					0.38	0.54	0.40	0.60	0.43
Uniform Delay, d1	51.9	51.2	46.1					10.9	0.0	59.8	7.1	0.0
Progression Factor	1.00	1.00	1.00					0.66	1.00	1.32	0.43	1.00
Incremental Delay, d2	2.8	2.9	0.1					0.3	1.1	0.7	0.7	0.8
Delay (s)	54.7	54.0	46.2					7.5	1.1	79.5	3.7	0.8
Level of Service	D	D	D					A	A	E	A	A
Approach Delay (s)		53.7			0.0			4.9			5.5	
Approach LOS		D			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

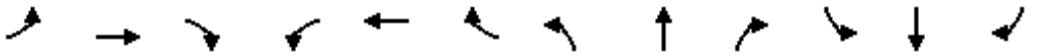
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	705	0	90	860	1280	0	0	685	745
Future Volume (vph)	0	0	0	705	0	90	860	1280	0	0	685	745
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	3.5			4.0	4.0
Lane Util. Factor				0.91	0.91	1.00	0.97	0.91			0.91	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				3221	1610	1583	3433	5085			5085	1583
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				3221	1610	1583	3433	5085			5085	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	750	0	96	915	1362	0	0	729	793
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	502	248	96	915	1362	0	0	729	793
Turn Type				custom	NA	Free	Prot	NA			NA	Free
Protected Phases				4			1	6			2	
Permitted Phases				4		Free						Free
Actuated Green, G (s)				26.3	26.3	135.0	66.7	97.2			24.0	135.0
Effective Green, g (s)				28.3	26.3	135.0	68.7	99.2			26.0	135.0
Actuated g/C Ratio				0.21	0.19	1.00	0.51	0.73			0.19	1.00
Clearance Time (s)				6.0			6.0	5.5			6.0	
Vehicle Extension (s)				3.0			3.5	5.0			5.0	
Lane Grp Cap (vph)				675	313	1583	1747	3736			979	1583
v/s Ratio Prot				c0.16	0.15		0.27	0.27			c0.14	
v/s Ratio Perm						0.06						c0.50
v/c Ratio				0.74	0.79	0.06	0.52	0.36			0.74	0.50
Uniform Delay, d1				50.0	51.7	0.0	22.2	6.5			51.4	0.0
Progression Factor				1.00	1.00	1.00	0.91	0.97			1.00	1.00
Incremental Delay, d2				4.4	12.8	0.1	1.1	0.1			3.7	1.1
Delay (s)				54.4	64.6	0.1	21.3	6.4			55.1	1.1
Level of Service				D	E	A	C	A			E	A
Approach Delay (s)		0.0			51.2			12.4			27.0	
Approach LOS		A			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		

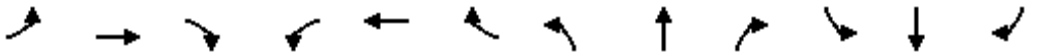
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	345	265	500	165	20	320	460	605	20	675	100
Future Volume (vph)	85	345	265	500	165	20	320	460	605	20	675	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.0	6.0	5.0	4.0		4.0	4.5	5.0	4.0	4.5	6.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		0.97	0.95	1.00	1.00	0.81	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	3433	1833		3433	3539	1583	1770	7544	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	3433	1833		3433	3539	1583	1770	7544	1583
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	96	388	298	562	185	22	360	517	680	22	758	112
RTOR Reduction (vph)	0	0	193	0	4	0	0	0	149	0	0	82
Lane Group Flow (vph)	96	388	105	562	203	0	360	517	531	22	758	30
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6	3	5	2	
Permitted Phases			4						6			2
Actuated Green, G (s)	24.1	24.1	24.1	30.2	30.2		14.9	44.4	74.6	4.7	34.2	34.2
Effective Green, g (s)	25.1	26.1	24.1	31.2	32.2		15.9	45.9	76.6	5.7	35.7	34.2
Actuated g/C Ratio	0.20	0.21	0.19	0.25	0.25		0.13	0.36	0.61	0.05	0.28	0.27
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.5	3.5		3.0	5.0	3.5	3.0	5.0	5.0
Lane Grp Cap (vph)	351	384	301	847	466		431	1285	1021	79	2130	428
v/s Ratio Prot	0.05	c0.21		c0.16	0.11		c0.10	0.15	c0.13	0.01	0.10	
v/s Ratio Perm			0.07						0.21			0.02
v/c Ratio	0.27	1.01	0.35	0.66	0.44		0.84	0.40	0.52	0.28	0.36	0.07
Uniform Delay, d1	42.9	50.2	44.4	42.9	39.5		54.0	30.0	14.3	58.4	36.2	34.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	48.6	0.7	2.1	0.8		13.1	0.9	0.5	1.9	0.5	0.3
Delay (s)	43.3	98.7	45.1	44.9	40.3		67.1	31.0	14.9	60.3	36.6	34.6
Level of Service	D	F	D	D	D		E	C	B	E	D	C
Approach Delay (s)		71.5			43.7			32.3			37.0	
Approach LOS		E			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	43.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	126.4	Sum of lost time (s)	18.5
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

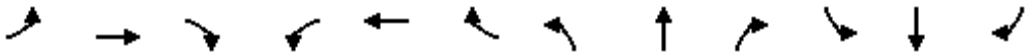
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	570	1345	135	80	1520	540	135	100	75	495	170	445
Future Volume (vph)	570	1345	135	80	1520	540	135	100	75	495	170	445
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	4.0	4.0	5.5	4.0	4.0	4.0	4.0	5.5	5.5	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	3539	1583	3433	3539	2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3433	3539	1583	3433	3539	2787
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	588	1387	139	82	1567	557	139	103	77	510	175	459
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	69	0	0	0
Lane Group Flow (vph)	588	1387	139	82	1567	557	139	103	8	510	175	459
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8	1	7	4	5
Permitted Phases			Free			Free			8			4
Actuated Green, G (s)	31.3	87.8	150.0	7.2	63.7	150.0	10.3	7.5	14.7	28.5	25.7	57.0
Effective Green, g (s)	31.3	87.8	150.0	7.2	63.7	150.0	10.3	7.5	14.7	28.5	25.7	57.0
Actuated g/C Ratio	0.21	0.59	1.00	0.05	0.42	1.00	0.07	0.05	0.10	0.19	0.17	0.38
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	4.0	4.0	5.5	5.5	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	3.0	3.0	5.0	5.0	3.0
Lane Grp Cap (vph)	716	2976	1583	164	2159	1583	235	176	197	652	606	1059
v/s Ratio Prot	c0.17	0.27		0.02	c0.31		0.04	c0.03	0.00	c0.15	0.05	0.09
v/s Ratio Perm			0.09			0.35			0.00			0.07
v/c Ratio	0.82	0.47	0.09	0.50	0.73	0.35	0.59	0.59	0.04	0.78	0.29	0.43
Uniform Delay, d1	56.7	17.7	0.0	69.6	35.9	0.0	67.8	69.7	61.3	57.8	54.2	34.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.98	1.00
Incremental Delay, d2	7.5	0.5	0.1	2.4	2.2	0.6	4.0	4.9	0.1	6.7	0.5	0.3
Delay (s)	64.2	18.3	0.1	72.0	38.1	0.6	71.8	74.6	61.3	63.0	53.7	34.8
Level of Service	E	B	A	E	D	A	E	E	E	E	D	C
Approach Delay (s)		29.8			29.9			70.2			50.2	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

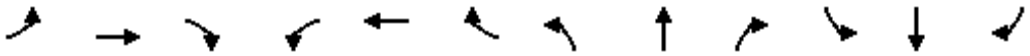
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	0	45	40	0	30	70	1080	55	25	1050	20
Future Volume (vph)	20	0	45	40	0	30	70	1080	55	25	1050	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.91			0.94		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1663			1707		1770	3514		1770	3529	
Flt Permitted		0.87			0.68		0.25	1.00		0.23	1.00	
Satd. Flow (perm)		1464			1186		458	3514		425	3529	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	21	0	47	42	0	31	73	1125	57	26	1094	21
RTOR Reduction (vph)	0	44	0	0	20	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	24	0	0	53	0	73	1181	0	26	1115	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		10.7			10.7		131.3	131.3		131.3	131.3	
Effective Green, g (s)		10.7			10.7		131.3	131.3		131.3	131.3	
Actuated g/C Ratio		0.07			0.07		0.88	0.88		0.88	0.88	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		104			84		400	3075		372	3089	
v/s Ratio Prot								c0.34			0.32	
v/s Ratio Perm		0.02			c0.04		0.16			0.06		
v/c Ratio		0.23			0.63		0.18	0.38		0.07	0.36	
Uniform Delay, d1		65.8			67.7		1.4	1.8		1.2	1.7	
Progression Factor		1.00			1.00		0.39	0.63		1.00	1.00	
Incremental Delay, d2		1.2			13.7		0.8	0.3		0.4	0.3	
Delay (s)		66.9			81.4		1.4	1.4		1.6	2.0	
Level of Service		E			F		A	A		A	A	
Approach Delay (s)		66.9			81.4			1.4			2.0	
Approach LOS		E			F			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

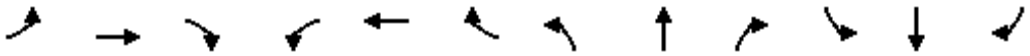
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	5	0	195	0	630	10	860	220	465	850	15
Future Volume (vph)	15	5	0	195	0	630	10	860	220	465	850	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		1.00			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.96			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1794			1770	1583	1770	3539	1583	3433	3530	
Flt Permitted		0.77			0.74	1.00	0.31	1.00	1.00	0.18	1.00	
Satd. Flow (perm)		1434			1385	1583	572	3539	1583	656	3530	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	16	5	0	210	0	677	11	925	237	500	914	16
RTOR Reduction (vph)	0	0	0	0	0	303	0	0	134	0	1	0
Lane Group Flow (vph)	0	21	0	0	210	374	11	925	103	500	929	0
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8	6		6	2		
Actuated Green, G (s)		24.0			24.0	24.0	45.0	43.1	43.1	63.3	56.4	
Effective Green, g (s)		24.0			24.0	24.0	45.0	43.1	43.1	63.3	56.4	
Actuated g/C Ratio		0.24			0.24	0.24	0.45	0.43	0.43	0.64	0.57	
Clearance Time (s)		6.0			6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	4.0	6.0	6.0	4.0	6.0	
Lane Grp Cap (vph)		346			334	382	282	1536	687	843	2004	
v/s Ratio Prot							0.00	0.26		c0.09	0.26	
v/s Ratio Perm		0.01			0.15	c0.24	0.02		0.06	c0.29		
v/c Ratio		0.06			0.63	0.98	0.04	0.60	0.15	0.59	0.46	
Uniform Delay, d1		29.0			33.7	37.4	14.9	21.5	17.0	11.2	12.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1			3.7	39.8	0.1	1.8	0.5	1.3	0.8	
Delay (s)		29.0			37.3	77.2	15.0	23.3	17.5	12.5	13.4	
Level of Service		C			D	E	B	C	B	B	B	
Approach Delay (s)		29.0			67.8			22.0			13.1	
Approach LOS		C			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	99.3	Sum of lost time (s)	17.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		

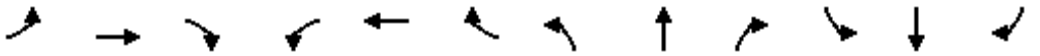
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	15	25	0	20	10	1420	30	45	1240	15
Future Volume (vph)	45	0	15	25	0	20	10	1420	30	45	1240	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.0			8.0		5.0	10.0		5.0	10.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.97			0.94		1.00	1.00		1.00	1.00	
Flt Protected		0.96			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1735			1703		1770	3528		1770	3533	
Flt Permitted		0.96			0.97		0.18	1.00		0.12	1.00	
Satd. Flow (perm)		1735			1703		341	3528		230	3533	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	46	0	15	26	0	21	10	1464	31	46	1278	15
RTOR Reduction (vph)	0	59	0	0	45	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	2	0	0	2	0	10	1494	0	46	1292	0
Turn Type	Split	NA		Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	4	4		8	8		1	6		5	2	
Permitted Phases							6			2		
Actuated Green, G (s)		6.0			6.0		104.1	101.7		109.9	104.6	
Effective Green, g (s)		6.0			6.0		104.1	101.7		109.9	104.6	
Actuated g/C Ratio		0.04			0.04		0.69	0.68		0.73	0.70	
Clearance Time (s)		8.0			8.0		5.0	10.0		5.0	10.0	
Vehicle Extension (s)		5.0			5.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		69			68		259	2391		222	2463	
v/s Ratio Prot		c0.00			c0.00		0.00	c0.42		c0.01	c0.37	
v/s Ratio Perm							0.03			0.14		
v/c Ratio		0.04			0.03		0.04	0.62		0.21	0.52	
Uniform Delay, d1		69.2			69.2		7.8	13.5		9.1	10.8	
Progression Factor		1.00			1.00		1.00	1.00		0.23	0.55	
Incremental Delay, d2		0.4			0.3		0.1	1.2		0.4	0.6	
Delay (s)		69.7			69.5		7.9	14.7		2.5	6.6	
Level of Service		E			E		A	B		A	A	
Approach Delay (s)		69.7			69.5			14.7			6.4	
Approach LOS		E			E			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

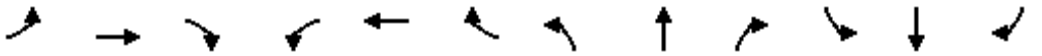
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	55	230	155	45	195	180	1215	90	165	915	165
Future Volume (vph)	85	55	230	155	45	195	180	1215	90	165	915	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	6.0		4.0	6.0	3.0	4.0	4.0	3.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91	1.00	0.97	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1808	1583		1793	1583	1770	5085	1583	3433	3458	
Flt Permitted		0.60	1.00		0.60	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1115	1583		1122	1583	1770	5085	1583	3433	3458	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	90	59	245	165	48	207	191	1293	96	176	973	176
RTOR Reduction (vph)	0	0	172	0	0	145	0	0	47	0	10	0
Lane Group Flow (vph)	0	149	74	0	213	62	191	1293	49	176	1139	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8			6			
Actuated Green, G (s)		45.0	45.0		45.0	45.0	20.4	74.0	74.0	14.0	67.6	
Effective Green, g (s)		47.0	45.0		47.0	45.0	22.4	76.0	76.0	16.0	69.6	
Actuated g/C Ratio		0.31	0.30		0.31	0.30	0.15	0.51	0.51	0.11	0.46	
Clearance Time (s)		6.0	6.0		6.0	6.0	5.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)		349	474		351	474	264	2576	802	366	1604	
v/s Ratio Prot							c0.11	0.25		0.05	c0.33	
v/s Ratio Perm		0.13	0.05		c0.19	0.04			0.03			
v/c Ratio		0.43	0.16		0.61	0.13	0.72	0.50	0.06	0.48	0.71	
Uniform Delay, d1		40.8	38.5		43.7	38.3	60.8	24.5	18.8	63.1	32.1	
Progression Factor		1.00	1.00		1.00	1.00	0.80	0.92	2.04	1.45	0.48	
Incremental Delay, d2		3.8	0.7		7.6	0.6	8.0	0.6	0.1	3.8	2.3	
Delay (s)		44.6	39.2		51.3	38.8	56.5	23.0	38.5	95.1	17.6	
Level of Service		D	D		D	D	E	C	D	F	B	
Approach Delay (s)		41.3			45.1			28.0			27.9	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	470	285	100	450	465	525	90	675	360	535	810	1010
Future Volume (vph)	470	285	100	450	465	525	90	675	360	535	810	1010
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5
Lane Util. Factor	0.94	0.95		0.97	1.00	1.00	1.00	0.91	1.00	0.94	0.95	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	4990	3402		3433	1863	1583	1770	5085	1583	4990	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	4990	3402		3433	1863	1583	1770	5085	1583	4990	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	495	300	105	474	489	553	95	711	379	563	853	1063
RTOR Reduction (vph)	0	26	0	0	0	0	0	0	247	0	0	352
Lane Group Flow (vph)	495	379	0	474	489	553	95	711	132	563	853	711
Turn Type	Split	NA		Split	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases						Free			6			2
Actuated Green, G (s)	22.4	22.4		32.0	32.0	150.0	17.1	50.4	50.4	22.2	55.5	55.5
Effective Green, g (s)	24.4	24.4		34.0	34.0	150.0	18.1	52.4	52.4	23.2	57.0	57.0
Actuated g/C Ratio	0.16	0.16		0.23	0.23	1.00	0.12	0.35	0.35	0.15	0.38	0.38
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	811	553		778	422	1583	213	1776	552	771	1344	601
v/s Ratio Prot	0.10	c0.11		0.14	c0.26		0.05	0.14		c0.11	0.24	
v/s Ratio Perm						0.35			0.08			c0.45
v/c Ratio	0.61	0.69		0.61	1.16	0.35	0.45	0.40	0.24	0.73	0.63	1.18
Uniform Delay, d1	58.4	59.2		52.0	58.0	0.0	61.3	36.9	34.7	60.4	38.0	46.5
Progression Factor	1.00	1.00		1.32	1.31	1.00	1.00	1.00	1.00	1.28	0.64	0.68
Incremental Delay, d2	1.2	3.2		1.0	92.9	0.5	1.5	0.7	1.0	2.8	1.8	95.2
Delay (s)	59.5	62.4		69.8	168.6	0.5	62.8	37.6	35.7	80.2	26.0	127.0
Level of Service	E	E		E	F	A	E	D	D	F	C	F
Approach Delay (s)		60.8			76.4			39.0			81.7	
Approach LOS		E			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	68.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

2040 Continuous Flow Intersection Alternative

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Traffic Volume (vph)	2445	170	2205	275	285	100	75	450	510	1015	240	225
Future Volume (vph)	2445	170	2205	275	285	100	75	450	510	1015	240	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.0	4.5	4.0	5.5	6.5	4.0	6.5	6.5	4.0	4.5	4.5
Lane Util. Factor	0.91	1.00	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	5085	1583	5085	1583	3433	3539	1583	3433	3539	1583	3433	3433
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	5085	1583	5085	1583	3433	3539	1583	3433	3539	1583	3433	3433
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)	2658	185	2397	299	310	109	82	489	554	1103	261	245
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	2658	185	2397	299	310	109	82	489	554	1103	261	245
Turn Type	NA	Free	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	Prot
Protected Phases	1		5		3	8		7	4		5	1
Permitted Phases		Free		Free			Free			Free		
Actuated Green, G (s)	84.5	150.0	84.5	150.0	22.5	22.1	150.0	25.9	26.5	150.0	84.5	84.5
Effective Green, g (s)	84.5	150.0	84.5	150.0	22.5	22.1	150.0	25.9	26.5	150.0	84.5	84.5
Actuated g/C Ratio	0.56	1.00	0.56	1.00	0.15	0.15	1.00	0.17	0.18	1.00	0.56	0.56
Clearance Time (s)	4.5		4.5		5.5	6.5		6.5	6.5		4.5	4.5
Vehicle Extension (s)	5.0		3.0		5.0	3.0		3.0	3.0		3.0	5.0
Lane Grp Cap (vph)	2864	1583	2864	1583	514	521	1583	592	625	1583	1933	1933
v/s Ratio Prot	c0.52		0.47		0.09	0.03		c0.14	c0.16		0.08	0.07
v/s Ratio Perm		0.12		0.19			0.05			c0.70		
v/c Ratio	0.93	0.12	0.84	0.19	0.60	0.21	0.05	0.83	0.89	0.70	0.14	0.13
Uniform Delay, d1	30.0	0.0	27.1	0.0	59.6	56.3	0.0	59.9	60.3	0.0	15.5	15.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.46	0.36
Incremental Delay, d2	4.1	0.1	2.0	0.2	5.2	0.9	0.1	9.2	14.2	2.6	0.1	0.1
Delay (s)	34.1	0.1	29.0	0.2	64.7	57.2	0.1	69.1	74.5	2.6	38.2	5.7
Level of Service	C	A	C	A	E	E	A	E	E	A	D	A
Approach Delay (s)	31.9		25.8			52.5			36.3			
Approach LOS	C		C			D			D			

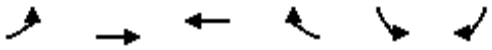
Intersection Summary			
HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2895	0	225	2480	0	75
Future Volume (vph)	2895	0	225	2480	0	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5		5.5	4.0		5.5
Lane Util. Factor	0.91		0.97	0.95		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	5085		3433	3539		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	5085		3433	3539		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3147	0	245	2696	0	82
RTOR Reduction (vph)	0	0	0	0	0	3
Lane Group Flow (vph)	3147	0	245	2696	0	79
Turn Type	NA		Prot	NA		Perm
Protected Phases	2		1	Free		
Permitted Phases						1
Actuated Green, G (s)	117.5		21.5	150.0		21.5
Effective Green, g (s)	117.5		21.5	150.0		21.5
Actuated g/C Ratio	0.78		0.14	1.00		0.14
Clearance Time (s)	5.5		5.5			5.5
Vehicle Extension (s)	5.0		5.0			5.0
Lane Grp Cap (vph)	3983		492	3539		230
v/s Ratio Prot	0.62		0.07	0.76		
v/s Ratio Perm						0.05
v/c Ratio	0.79		0.50	0.76		0.34
Uniform Delay, d1	9.2		59.3	0.0		57.9
Progression Factor	0.04		1.00	1.00		1.00
Incremental Delay, d2	0.7		3.6	1.6		4.0
Delay (s)	1.0		62.8	1.6		61.9
Level of Service	A		E	A		E
Approach Delay (s)	1.0			6.7	61.9	
Approach LOS	A			A	E	

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	240	2615	2490	0	0	435
Future Volume (vph)	240	2615	2490	0	0	435
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.5			5.5
Lane Util. Factor	0.97	0.95	0.91			1.00
Frt	1.00	1.00	1.00			0.86
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	3539	5085			1611
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	3539	5085			1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	2842	2707	0	0	473
RTOR Reduction (vph)	0	0	0	0	0	1
Lane Group Flow (vph)	261	2842	2707	0	0	472
Turn Type	Prot	NA	NA			Perm
Protected Phases	5	Free	6			
Permitted Phases						5
Actuated Green, G (s)	47.5	150.0	91.5			47.5
Effective Green, g (s)	47.5	150.0	91.5			47.5
Actuated g/C Ratio	0.32	1.00	0.61			0.32
Clearance Time (s)	5.5		5.5			5.5
Vehicle Extension (s)	3.0		5.0			3.0
Lane Grp Cap (vph)	1087	3539	3101			510
v/s Ratio Prot	0.08	0.80	c0.53			
v/s Ratio Perm						c0.29
v/c Ratio	0.24	0.80	0.87			0.92
Uniform Delay, d1	37.9	0.0	24.4			49.5
Progression Factor	1.00	1.00	0.36			1.00
Incremental Delay, d2	0.1	2.0	2.1			17.6
Delay (s)	38.0	2.0	11.0			67.1
Level of Service	D	A	B			E
Approach Delay (s)		5.1	11.0		67.1	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Traffic Volume (vph)	2445	170	1640	630	460	475	235	595	160	435	1125	145
Future Volume (vph)	2445	170	1640	630	460	475	235	595	160	435	1125	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.0	4.5	4.0	5.5	6.5	4.0	6.5	6.5	4.0	4.5	4.5
Lane Util. Factor	0.91	1.00	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	5085	1583	5085	1583	3433	3539	1583	3433	3539	1583	3433	3433
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	5085	1583	5085	1583	3433	3539	1583	3433	3539	1583	3433	3433
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)	2658	185	1783	685	500	516	255	647	174	473	1223	158
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	2658	185	1783	685	500	516	255	647	174	473	1223	158
Turn Type	NA	Free	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	Prot
Protected Phases	1		5		3	8		7	4		5	1
Permitted Phases		Free		Free			Free			Free		
Actuated Green, G (s)	81.5	150.0	81.5	150.0	32.5	22.5	150.0	28.5	19.5	150.0	81.5	81.5
Effective Green, g (s)	81.5	150.0	81.5	150.0	32.5	22.5	150.0	28.5	19.5	150.0	81.5	81.5
Actuated g/C Ratio	0.54	1.00	0.54	1.00	0.22	0.15	1.00	0.19	0.13	1.00	0.54	0.54
Clearance Time (s)	4.5		4.5		5.5	6.5		6.5	6.5		4.5	4.5
Vehicle Extension (s)	5.0		3.0		5.0	3.0		3.0	3.0		3.0	5.0
Lane Grp Cap (vph)	2762	1583	2762	1583	743	530	1583	652	460	1583	1865	1865
v/s Ratio Prot	c0.52		0.35		0.15	c0.15		c0.19	0.05		0.36	0.05
v/s Ratio Perm		0.12		c0.43			0.16			0.30		
v/c Ratio	0.96	0.12	0.65	0.43	0.67	0.97	0.16	0.99	0.38	0.30	0.66	0.08
Uniform Delay, d1	32.8	0.0	24.1	0.0	53.9	63.5	0.0	60.6	59.7	0.0	24.3	16.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.21	2.29
Incremental Delay, d2	6.8	0.1	0.8	0.6	4.8	33.1	0.2	33.1	0.5	0.5	0.9	0.1
Delay (s)	39.6	0.1	24.9	0.6	58.7	96.5	0.2	93.8	60.2	0.5	54.5	37.6
Level of Service	D	A	C	A	E	F	A	F	E	A	D	D
Approach Delay (s)	37.0		18.2			62.3			55.2			
Approach LOS	D		B			E			E			

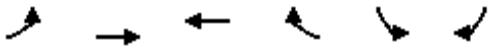
Intersection Summary			
HCM 2000 Control Delay	40.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	127.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	3040	0	145	2270	0	235
Future Volume (vph)	3040	0	145	2270	0	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5		5.5	4.0		5.5
Lane Util. Factor	0.91		0.97	0.95		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	5085		3433	3539		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	5085		3433	3539		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3304	0	158	2467	0	255
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	3304	0	158	2467	0	253
Turn Type	NA		Prot	NA		Perm
Protected Phases	2		1	Free		
Permitted Phases						1
Actuated Green, G (s)	108.5		30.5	150.0		30.5
Effective Green, g (s)	108.5		30.5	150.0		30.5
Actuated g/C Ratio	0.72		0.20	1.00		0.20
Clearance Time (s)	5.5		5.5			5.5
Vehicle Extension (s)	5.0		5.0			5.0
Lane Grp Cap (vph)	3678		698	3539		327
v/s Ratio Prot	c0.65		0.05	0.70		
v/s Ratio Perm						0.16
v/c Ratio	0.90		0.23	0.70		0.77
Uniform Delay, d1	16.4		49.9	0.0		56.5
Progression Factor	0.47		1.00	1.00		1.00
Incremental Delay, d2	1.2		0.8	1.2		16.2
Delay (s)	8.9		50.7	1.2		72.7
Level of Service	A		D	A		E
Approach Delay (s)	8.9			4.1	72.7	
Approach LOS	A			A	E	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1125	2615	2100	0	0	435
Future Volume (vph)	1125	2615	2100	0	0	435
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.5			5.5
Lane Util. Factor	0.97	0.95	0.91			1.00
Frt	1.00	1.00	1.00			0.86
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3433	3539	5085			1611
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3433	3539	5085			1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1223	2842	2283	0	0	473
RTOR Reduction (vph)	0	0	0	0	0	1
Lane Group Flow (vph)	1223	2842	2283	0	0	472
Turn Type	Prot	NA	NA			Perm
Protected Phases	5	Free	6			
Permitted Phases						5
Actuated Green, G (s)	59.1	150.0	79.9			59.1
Effective Green, g (s)	59.1	150.0	79.9			59.1
Actuated g/C Ratio	0.39	1.00	0.53			0.39
Clearance Time (s)	5.5		5.5			5.5
Vehicle Extension (s)	3.0		5.0			3.0
Lane Grp Cap (vph)	1352	3539	2708			634
v/s Ratio Prot	c0.36	0.80	0.45			
v/s Ratio Perm						0.29
v/c Ratio	0.90	0.80	0.84			0.74
Uniform Delay, d1	42.8	0.0	29.7			39.0
Progression Factor	1.00	1.00	0.72			1.00
Incremental Delay, d2	8.8	2.0	2.6			4.6
Delay (s)	51.6	2.0	24.0			43.6
Level of Service	D	A	C			D
Approach Delay (s)		16.9	24.0		43.6	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Traffic Volume (vph)	1345	135	1520	540	135	100	75	495	170	445	570	80
Future Volume (vph)	1345	135	1520	540	135	100	75	495	170	445	570	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.0	4.5	4.0	5.5	6.5	4.0	6.5	6.5	4.0	4.5	4.5
Lane Util. Factor	0.91	1.00	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	5085	1583	5085	1583	3433	3539	1583	3433	3539	1583	3433	3433
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	5085	1583	5085	1583	3433	3539	1583	3433	3539	1583	3433	3433
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)	1462	147	1652	587	147	109	82	538	185	484	620	87
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1462	147	1652	587	147	109	82	538	185	484	620	87
Turn Type	NA	Free	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	Prot
Protected Phases	1		5		3	8		7	4		5	1
Permitted Phases		Free		Free			Free			Free		
Actuated Green, G (s)	74.5	150.0	74.5	150.0	24.5	29.2	150.0	28.8	34.5	150.0	74.5	74.5
Effective Green, g (s)	74.5	150.0	74.5	150.0	24.5	29.2	150.0	28.8	34.5	150.0	74.5	74.5
Actuated g/C Ratio	0.50	1.00	0.50	1.00	0.16	0.19	1.00	0.19	0.23	1.00	0.50	0.50
Clearance Time (s)	4.5		4.5		5.5	6.5		6.5	6.5		4.5	4.5
Vehicle Extension (s)	5.0		3.0		5.0	3.0		3.0	3.0		3.0	5.0
Lane Grp Cap (vph)	2525	1583	2525	1583	560	688	1583	659	813	1583	1705	1705
v/s Ratio Prot	0.29		c0.32		0.04	0.03		c0.16	0.05		0.18	0.03
v/s Ratio Perm		0.09		c0.37			0.05			0.31		
v/c Ratio	0.58	0.09	0.65	0.37	0.26	0.16	0.05	0.82	0.23	0.31	0.36	0.05
Uniform Delay, d1	26.7	0.0	28.1	0.0	54.9	50.2	0.0	58.1	46.9	0.0	23.2	19.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.98	1.00	1.29	0.54
Incremental Delay, d2	0.9	0.1	1.0	0.5	1.1	0.5	0.1	7.4	0.1	0.5	0.6	0.1
Delay (s)	27.6	0.1	29.2	0.5	56.0	50.7	0.1	63.6	46.2	0.5	30.5	10.5
Level of Service	C	A	C	A	E	D	A	E	D	A	C	B
Approach Delay (s)	25.0		21.7			40.7			35.6			
Approach LOS	C		C			D			D			

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix D:

2040 No build and Recommended Design Queuing Summary Tables

Intersection: 1: # MD 713 & MD 175

Movement	EB	EB	EB	EB	B40	B40	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	T	L	L	T	T	R	L
Maximum Queue (ft)	173	247	552	560	590	655	119	480	1102	1108	1088	269
Average Queue (ft)	86	96	387	396	158	171	43	273	1074	1073	1069	162
95th Queue (ft)	148	184	546	552	603	632	91	618	1091	1089	1077	230
Link Distance (ft)		662	662	662	622	622			1054	1054	1054	1079
Upstream Blk Time (%)			0	0	2	3			74	87	63	
Queuing Penalty (veh)			0	0	0	0			0	0	0	
Storage Bay Dist (ft)	355						280	280				
Storage Blk Time (%)									68			
Queuing Penalty (veh)									152			

Intersection: 1: # MD 713 & MD 175

Movement	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	T	T	R	L	LT	TR	R
Maximum Queue (ft)	240	180	6	52	300	337	347	345
Average Queue (ft)	140	32	0	3	166	227	252	234
95th Queue (ft)	213	114	5	35	249	302	323	314
Link Distance (ft)	1079	1079	1079			502	502	502
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)				395	340			
Storage Blk Time (%)					0	0		
Queuing Penalty (veh)					0	0		

Intersection: 2: # MD 713 & Metacomet Rd/Stone Castle Dr

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	R	L	TR
Maximum Queue (ft)	55	230	32	4	29	6
Average Queue (ft)	22	79	5	0	4	0
95th Queue (ft)	50	207	22	3	20	4
Link Distance (ft)	413	541		1864		1528
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			150		140	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: # MD 713 & Ridgewood Rd/Severn Rd

Movement	EB	WB	WB	NB	NB	NB	SB	SB	B47
Directions Served	LTR	LT	R	L	T	R	L	TR	T
Maximum Queue (ft)	59	528	190	105	488	258	194	412	1343
Average Queue (ft)	21	491	187	15	257	53	124	387	1149
95th Queue (ft)	54	509	212	70	467	206	235	403	1576
Link Distance (ft)	447	471			1160			311	1345
Upstream Blk Time (%)		55						47	0
Queuing Penalty (veh)		0						572	6
Storage Bay Dist (ft)			165	130		370	170		
Storage Blk Time (%)		47	8		29	0	0	46	
Queuing Penalty (veh)		347	53		33	0	1	80	

Intersection: 4: # MD 713 & Watts Ave/Ridge Forest Way

Movement	EB	WB	NB	NB	NB	B47	B47	SB	SB	B48	B44	B18
Directions Served	LTR	LTR	L	T	R	T		L	TR	T	T	T
Maximum Queue (ft)	132	116	124	804	105	388	72	218	428	1175	545	654
Average Queue (ft)	66	45	23	395	29	62	13	18	394	941	323	284
95th Queue (ft)	118	90	75	908	101	292	122	103	455	1524	711	769
Link Distance (ft)	321	319		1345		311	311		327	1064	435	623
Upstream Blk Time (%)				2		2	0		50	50	41	18
Queuing Penalty (veh)				27		12	2		508	511	424	91
Storage Bay Dist (ft)			100		80			195				
Storage Blk Time (%)				28	0				49			
Queuing Penalty (veh)				32	0				7			

Intersection: 4: # MD 713 & Watts Ave/Ridge Forest Way

Movement	B18
Directions Served	
Maximum Queue (ft)	602
Average Queue (ft)	227
95th Queue (ft)	690
Link Distance (ft)	623
Upstream Blk Time (%)	3
Queuing Penalty (veh)	17
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: # MD 713 & Teague Rd.

Movement	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	T	R	L	L	T
Maximum Queue (ft)	92	90	520	439	148	202	241	320	27	179	398	425
Average Queue (ft)	44	38	243	163	45	88	128	196	2	122	203	211
95th Queue (ft)	88	73	500	388	102	170	219	322	14	209	423	444
Link Distance (ft)	220	220	534	534		623	623				468	468
Upstream Blk Time (%)			10	4							4	3
Queuing Penalty (veh)			0	0							14	12
Storage Bay Dist (ft)					200			480	480	155		
Storage Blk Time (%)						0				4	14	
Queuing Penalty (veh)						0				9	32	

Intersection: 5: # MD 713 & Teague Rd.

Movement	SB
Directions Served	TR
Maximum Queue (ft)	450
Average Queue (ft)	208
95th Queue (ft)	450
Link Distance (ft)	468
Upstream Blk Time (%)	3
Queuing Penalty (veh)	12
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Arundel Mills Blvd. & # MD 713

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	L	T	T	T
Maximum Queue (ft)	90	65	133	68	111	110	381	474	77	122	101	101
Average Queue (ft)	40	22	63	15	31	50	99	213	23	64	29	42
95th Queue (ft)	79	55	110	47	76	94	281	530	57	112	75	86
Link Distance (ft)	368	368	368	368		468	468	468		1022	1022	1022
Upstream Blk Time (%)							0	1				
Queuing Penalty (veh)							0	3				
Storage Bay Dist (ft)					190				300			
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 6: Arundel Mills Blvd. & # MD 713

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	L	T	T
Maximum Queue (ft)	118	307	336	344	302	160
Average Queue (ft)	53	163	164	174	79	86
95th Queue (ft)	95	289	298	311	248	148
Link Distance (ft)					880	880
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					2	
Storage Bay Dist (ft)	300	500	500	500		
Storage Blk Time (%)		1	1	1		
Queuing Penalty (veh)		3	3	3		

Intersection: 7: # MD 713 & Bass Pro Dr.

Movement	EB	EB	EB	EB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	L	T	R	T	T	T	L	L	T	T	T
Maximum Queue (ft)	127	106	68	35	139	125	129	80	279	467	377	215
Average Queue (ft)	61	26	18	12	51	50	37	31	39	167	74	36
95th Queue (ft)	111	70	49	37	111	100	91	64	147	377	244	142
Link Distance (ft)	299	299	299	299	880	880	880		496	496	496	496
Upstream Blk Time (%)										0	0	0
Queuing Penalty (veh)										1	1	0
Storage Bay Dist (ft)								400				
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 7: # MD 713 & Bass Pro Dr.

Movement	SB
Directions Served	R
Maximum Queue (ft)	110
Average Queue (ft)	4
95th Queue (ft)	71
Link Distance (ft)	496
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: # MD 713 & MD 100 Westbound Ramps

Movement	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	LT	L	L	T	T	T	T	T	T	R
Maximum Queue (ft)	177	203	183	288	251	154	178	230	184	203	397	221
Average Queue (ft)	47	115	93	167	134	50	60	116	86	98	87	32
95th Queue (ft)	135	181	161	253	223	117	135	200	162	169	224	135
Link Distance (ft)			853	448	448	448	448	448		705	705	705
Upstream Blk Time (%)											0	
Queuing Penalty (veh)											0	
Storage Bay Dist (ft)	400	400							470			
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 9: # MD 713 & MD 176

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	L	L	TR	L	L	T	T	R	L	T
Maximum Queue (ft)	108	166	313	446	345	154	182	294	390	248	76	225
Average Queue (ft)	33	73	138	248	130	83	106	170	190	59	28	85
95th Queue (ft)	79	133	250	381	246	142	164	263	301	165	61	162
Link Distance (ft)		548	782	782			705	705	705	705		1203
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225				400	600					200	
Storage Blk Time (%)				1	0							0
Queuing Penalty (veh)				3	0							0

Intersection: 9: # MD 713 & MD 176

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	264	56
Average Queue (ft)	144	20
95th Queue (ft)	235	50
Link Distance (ft)	1203	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Zone Summary

Zone wide Queuing Penalty: 2973

Intersection: 1: # MD 713 & MD 175

Movement	EB	EB	EB	EB	B40	B40	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	T	L	L	T	T	R	L
Maximum Queue (ft)	380	755	709	658	654	662	127	480	1102	1099	1095	1116
Average Queue (ft)	339	677	266	190	551	557	56	316	1018	1071	1071	949
95th Queue (ft)	424	922	739	581	886	892	114	645	1311	1085	1083	1319
Link Distance (ft)		662	662	662	622	622			1054	1054	1054	1079
Upstream Blk Time (%)		81	6	0	67	73			44	66	58	53
Queuing Penalty (veh)		0	0	0	0	0			0	0	0	0
Storage Bay Dist (ft)	355						280	280				
Storage Blk Time (%)	36	86							58			
Queuing Penalty (veh)	140	332							84			

Intersection: 1: # MD 713 & MD 175

Movement	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	T	T	R	L	LT	TR	R
Maximum Queue (ft)	1112	1099	1106	420	273	295	204	184
Average Queue (ft)	944	919	795	252	156	174	113	101
95th Queue (ft)	1318	1333	1376	559	229	250	173	163
Link Distance (ft)	1079	1079	1079			502	502	502
Upstream Blk Time (%)	58	46	26					
Queuing Penalty (veh)	0	0	0					
Storage Bay Dist (ft)				395	340			
Storage Blk Time (%)			65	0	0	0		
Queuing Penalty (veh)			153	0	0	0		

Intersection: 2: # MD 713 & Metacomet Rd/Stone Castle Dr

Movement	EB	WB	NB	NB	NB	B41	B41	B41	SB
Directions Served	LTR	LTR	L	T	R	T	T		L
Maximum Queue (ft)	222	518	174	1966	1971	550	552	538	54
Average Queue (ft)	95	351	46	1936	1925	494	494	468	15
95th Queue (ft)	267	648	172	1976	2076	652	667	704	41
Link Distance (ft)	413	541		1864	1864	502	502	502	
Upstream Blk Time (%)		26		98	85	43	41	42	
Queuing Penalty (veh)		0		862	745	251	241	245	
Storage Bay Dist (ft)			150						140
Storage Blk Time (%)			0	92					
Queuing Penalty (veh)			0	37					

Intersection: 3: # MD 713 & Ridgewood Rd/Severn Rd

Movement	EB	WB	WB	NB	NB	NB	B43	SB	SB	B47
Directions Served	LTR	LT	R	L	T	R	T	L	TR	T
Maximum Queue (ft)	66	487	190	154	1268	395	1547	195	396	569
Average Queue (ft)	20	239	160	9	1231	369	1534	180	313	125
95th Queue (ft)	52	490	230	66	1251	520	1555	229	462	466
Link Distance (ft)	444	472			1156		1528		308	1345
Upstream Blk Time (%)		10			80		28		16	
Queuing Penalty (veh)		0			1515		536		290	
Storage Bay Dist (ft)			165	130		370		170		
Storage Blk Time (%)		5	23		81	0		20	13	
Queuing Penalty (veh)		30	46		580	5		256	79	

Intersection: 4: # MD 713 & Watts Ave/Ridge Forest Way

Movement	EB	WB	NB	NB	NB	B47	B47	SB	SB	B48	B44	B18
Directions Served	LTR	LTR	L	T	R	T		L	TR	T	T	T
Maximum Queue (ft)	87	252	124	1448	105	391	366	219	429	1180	551	664
Average Queue (ft)	40	123	35	1390	12	312	231	58	402	1145	518	643
95th Queue (ft)	76	208	92	1587	62	480	501	179	415	1167	541	657
Link Distance (ft)	321	319		1345		308	308		327	1064	435	623
Upstream Blk Time (%)		0		47		22	10		47	65	74	50
Queuing Penalty (veh)		0		945		221	101		825	1132	1286	439
Storage Bay Dist (ft)			100		80			195				
Storage Blk Time (%)			0	44	0				46			
Queuing Penalty (veh)			1	63	0				34			

Intersection: 4: # MD 713 & Watts Ave/Ridge Forest Way

Movement	B18
Directions Served	
Maximum Queue (ft)	642
Average Queue (ft)	632
95th Queue (ft)	643
Link Distance (ft)	623
Upstream Blk Time (%)	19
Queuing Penalty (veh)	163
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: # MD 713 & Teague Rd.

Movement	EB	EB	WB	WB	NB	NB	NB	NB	NB	B18	B18	SB
Directions Served	LT	R	LT	R	L	T	T	T	R	T	T	L
Maximum Queue (ft)	241	217	562	564	224	651	678	570	492	104	135	180
Average Queue (ft)	143	96	548	525	86	367	381	363	53	6	9	115
95th Queue (ft)	243	192	559	675	222	598	630	566	283	76	84	228
Link Distance (ft)	220	220	534	534		623	623			435	435	
Upstream Blk Time (%)	6	3	90	55		1	2					
Queuing Penalty (veh)	0	0	0	0		13	21					
Storage Bay Dist (ft)					200			480	480			155
Storage Blk Time (%)					0	43	7	4	0			2
Queuing Penalty (veh)					0	62	51	15	0			5

Intersection: 5: # MD 713 & Teague Rd.

Movement	SB	SB	SB
Directions Served	L	T	TR
Maximum Queue (ft)	517	509	513
Average Queue (ft)	477	485	486
95th Queue (ft)	563	500	504
Link Distance (ft)	468	468	468
Upstream Blk Time (%)	30	38	41
Queuing Penalty (veh)	179	222	240
Storage Bay Dist (ft)			
Storage Blk Time (%)	14		
Queuing Penalty (veh)	31		

Intersection: 6: Arundel Mills Blvd. & # MD 713

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	L	T	T	T
Maximum Queue (ft)	246	255	269	233	164	330	494	480	157	620	939	1006
Average Queue (ft)	125	144	165	118	73	101	203	198	56	248	518	655
95th Queue (ft)	218	235	252	227	149	214	454	539	116	588	1007	1171
Link Distance (ft)	354	354	354	354		468	468	468		1022	1022	1022
Upstream Blk Time (%)	0	0				0	0	1		0	1	13
Queuing Penalty (veh)	0	0				0	2	4		0	0	0
Storage Bay Dist (ft)					190				300			
Storage Blk Time (%)					0	0				1		2
Queuing Penalty (veh)					0	0				1		11

Intersection: 6: Arundel Mills Blvd. & # MD 713

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	L	T	T
Maximum Queue (ft)	325	550	600	650	905	891
Average Queue (ft)	301	540	594	644	871	166
95th Queue (ft)	387	589	641	700	1072	593
Link Distance (ft)					881	881
Upstream Blk Time (%)					66	1
Queuing Penalty (veh)					495	8
Storage Bay Dist (ft)	300	500	500	500		
Storage Blk Time (%)	60	57	94	96	0	
Queuing Penalty (veh)	135	187	309	318	5	

Intersection: 7: # MD 713 & Bass Pro Dr.

Movement	EB	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	T	R	T	T	T	R	L	L	T	T
Maximum Queue (ft)	277	245	278	276	245	332	461	7	425	775	755	778
Average Queue (ft)	154	128	131	135	108	96	81	0	178	707	722	720
95th Queue (ft)	247	228	227	315	197	223	250	5	495	943	907	948
Link Distance (ft)	314	314	314	314	881	881	881	881		496	496	496
Upstream Blk Time (%)	1	1	0	9			0			83	94	92
Queuing Penalty (veh)	0	0	0	0			0			483	546	537
Storage Bay Dist (ft)									400			
Storage Blk Time (%)									0	80		
Queuing Penalty (veh)									0	37		

Intersection: 7: # MD 713 & Bass Pro Dr.

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	782	495
Average Queue (ft)	726	36
95th Queue (ft)	942	245
Link Distance (ft)	496	496
Upstream Blk Time (%)	91	0
Queuing Penalty (veh)	532	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: # MD 713 & MD 100 Westbound Ramps

Movement	WB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	LT	R	L	L	T	T	T	T	T	T
Maximum Queue (ft)	412	425	895	425	432	421	166	262	336	495	726	732
Average Queue (ft)	258	322	707	96	237	218	61	92	170	352	495	590
95th Queue (ft)	468	526	1149	388	377	368	132	198	300	613	887	963
Link Distance (ft)			853		448	448	448	448	448		708	708
Upstream Blk Time (%)			67		0	0					20	57
Queuing Penalty (veh)			0		0	0					95	274
Storage Bay Dist (ft)	400	400		400						470		
Storage Blk Time (%)	1	17	70	0						13	42	
Queuing Penalty (veh)	3	55	392	1						31	97	

Intersection: 8: # MD 713 & MD 100 Westbound Ramps

Movement	SB
Directions Served	R
Maximum Queue (ft)	763
Average Queue (ft)	603
95th Queue (ft)	1058
Link Distance (ft)	708
Upstream Blk Time (%)	67
Queuing Penalty (veh)	322
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 9: # MD 713 & MD 176

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	TR	L	L	T	T	R	L
Maximum Queue (ft)	250	576	572	793	804	425	186	213	209	218	219	125
Average Queue (ft)	99	433	383	417	579	143	110	129	108	121	79	13
95th Queue (ft)	261	740	793	924	1034	421	183	195	180	198	160	63
Link Distance (ft)		548	548	782	782			708	708	708	708	
Upstream Blk Time (%)		39	46	21	58							
Queuing Penalty (veh)		0	0	0	0							
Storage Bay Dist (ft)	225					400	600					200
Storage Blk Time (%)	0	37			63	0						
Queuing Penalty (veh)	0	32			117	0						

Intersection: 9: # MD 713 & MD 176

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	1220	1222	325
Average Queue (ft)	813	898	56
95th Queue (ft)	1541	1586	241
Link Distance (ft)	1203	1203	
Upstream Blk Time (%)	41	59	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			300
Storage Blk Time (%)	17	71	0
Queuing Penalty (veh)	3	71	0

Zone Summary

Zone wide Queuing Penalty: 17583

Intersection: 1: # MD 713 & MD 175

Movement	EB	EB	EB	EB	B40	B40	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	T	L	L	T	T	R	L
Maximum Queue (ft)	380	750	713	680	646	663	81	480	1099	1092	1094	183
Average Queue (ft)	324	522	303	269	256	268	24	232	1070	1069	1054	114
95th Queue (ft)	442	884	624	574	760	789	64	588	1094	1100	1257	172
Link Distance (ft)		662	662	662	622	622			1054	1054	1054	1079
Upstream Blk Time (%)		36	2	0	22	26			58	70	55	
Queuing Penalty (veh)		0	0	0	0	0			0	0	0	
Storage Bay Dist (ft)	355						280	280				
Storage Blk Time (%)	17	48							65			
Queuing Penalty (veh)	49	137							52			

Intersection: 1: # MD 713 & MD 175

Movement	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	T	T	R	L	LT	TR	R
Maximum Queue (ft)	172	139	17	21	253	260	226	228
Average Queue (ft)	93	27	1	1	161	181	147	139
95th Queue (ft)	161	89	8	15	231	250	215	212
Link Distance (ft)	1079	1079	1079			502	502	502
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)				395	340			
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: # MD 713 & Metacomet Rd/Stone Castle Dr

Movement	EB	WB	NB	NB	NB	B41	B41	B41	SB
Directions Served	LTR	LTR	L	T	R	T	T		L
Maximum Queue (ft)	119	493	174	1954	1970	539	546	530	32
Average Queue (ft)	36	242	43	1519	1353	306	301	228	7
95th Queue (ft)	94	539	163	2664	2673	706	701	604	27
Link Distance (ft)	413	541		1864	1864	502	502	502	
Upstream Blk Time (%)		9		65	51	19	16	8	
Queuing Penalty (veh)		0		348	276	70	56	30	
Storage Bay Dist (ft)			150						140
Storage Blk Time (%)				80					
Queuing Penalty (veh)				20					

Intersection: 3: # MD 713 & Ridgewood Rd/Severn Rd

Movement	EB	WB	WB	NB	NB	NB	B43	SB	SB	B47
Directions Served	LTR	LT	R	L	T	R	T	L	TR	T
Maximum Queue (ft)	51	404	190	154	1262	395	1546	195	416	1348
Average Queue (ft)	11	157	136	11	1235	298	1477	193	381	940
95th Queue (ft)	36	301	220	72	1253	561	1821	206	411	1549
Link Distance (ft)	444	471			1160		1528		308	1345
Upstream Blk Time (%)		0			78		20		38	1
Queuing Penalty (veh)		0			878		229		487	10
Storage Bay Dist (ft)			165	130		370		170		
Storage Blk Time (%)		3	7		71	0		42	11	
Queuing Penalty (veh)		19	13		164	1		362	53	

Intersection: 4: # MD 713 & Watts Ave/Ridge Forest Way

Movement	EB	WB	NB	NB	NB	B47	B47	SB	SB	B48	B44	B18
Directions Served	LTR	LTR	L	T	R	T		L	TR	T	T	T
Maximum Queue (ft)	97	105	68	1339	103	390	285	220	431	1171	544	659
Average Queue (ft)	45	35	7	932	6	112	34	57	387	1008	358	458
95th Queue (ft)	83	78	36	1616	45	376	201	178	497	1454	736	894
Link Distance (ft)	321	319		1345		308	308		327	1064	435	623
Upstream Blk Time (%)				9		3	1		37	38	38	21
Queuing Penalty (veh)				132		25	5		485	498	492	140
Storage Bay Dist (ft)			100		80			195				
Storage Blk Time (%)				34	0				36			
Queuing Penalty (veh)				14	0				16			

Intersection: 4: # MD 713 & Watts Ave/Ridge Forest Way

Movement	B18
Directions Served	
Maximum Queue (ft)	649
Average Queue (ft)	393
95th Queue (ft)	868
Link Distance (ft)	623
Upstream Blk Time (%)	6
Queuing Penalty (veh)	41
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: # MD 713 & Teague Rd.

Movement	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	T	T	R	L	L	T
Maximum Queue (ft)	195	231	467	235	224	292	268	255	7	179	488	499
Average Queue (ft)	105	106	230	78	84	172	174	164	0	54	223	341
95th Queue (ft)	184	198	458	217	184	257	247	236	5	148	503	567
Link Distance (ft)	220	220	534	534		623	623				468	468
Upstream Blk Time (%)	0	3	6	2							3	6
Queuing Penalty (veh)	0	0	0	0							10	24
Storage Bay Dist (ft)					200			480	480	155		
Storage Blk Time (%)					0	3				0	2	
Queuing Penalty (veh)					1	6				0	2	

Intersection: 5: # MD 713 & Teague Rd.

Movement	SB
Directions Served	TR
Maximum Queue (ft)	501
Average Queue (ft)	344
95th Queue (ft)	583
Link Distance (ft)	468
Upstream Blk Time (%)	8
Queuing Penalty (veh)	30
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Arundel Mills Blvd. & # MD 713

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	L	T	T	T
Maximum Queue (ft)	290	323	285	267	214	436	476	473	157	252	243	276
Average Queue (ft)	182	200	168	136	80	176	306	172	80	164	161	180
95th Queue (ft)	269	287	258	232	175	405	515	483	143	235	232	262
Link Distance (ft)	375	375	375	375		468	468	468		1022	1022	1022
Upstream Blk Time (%)	0	0				0	1	1				
Queuing Penalty (veh)	0	0				1	4	4				
Storage Bay Dist (ft)					190				300			
Storage Blk Time (%)					0	1				0		0
Queuing Penalty (veh)					0	2				0		0

Intersection: 6: Arundel Mills Blvd. & # MD 713

Movement	NB	SB	SB	SB	SB	SB	SB
Directions Served	R	L	L	L	T	T	R
Maximum Queue (ft)	281	483	534	570	644	622	90
Average Queue (ft)	122	188	239	253	360	367	3
95th Queue (ft)	219	407	462	478	518	516	48
Link Distance (ft)					881	881	881
Upstream Blk Time (%)					0	0	
Queuing Penalty (veh)					3	0	
Storage Bay Dist (ft)	300	500	500	500			
Storage Blk Time (%)	0	1	4	5	1		
Queuing Penalty (veh)	0	5	16	20	3		

Intersection: 7: # MD 713 & Bass Pro Dr.

Movement	EB	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	T	R	T	T	T	R	L	L	T	T
Maximum Queue (ft)	320	315	312	137	277	247	151	6	162	324	524	766
Average Queue (ft)	261	217	180	70	109	82	47	0	50	82	251	650
95th Queue (ft)	345	318	293	128	233	193	117	5	125	257	524	883
Link Distance (ft)	304	304	304	304	881	881	881	881		496	496	496
Upstream Blk Time (%)	7	2	2							0	1	25
Queuing Penalty (veh)	0	0	0							0	4	187
Storage Bay Dist (ft)									400			
Storage Blk Time (%)										0		
Queuing Penalty (veh)										0		

Intersection: 7: # MD 713 & Bass Pro Dr.

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	784	777
Average Queue (ft)	695	628
95th Queue (ft)	947	960
Link Distance (ft)	496	496
Upstream Blk Time (%)	38	22
Queuing Penalty (veh)	281	162
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: # MD 713 & MD 100 Westbound Ramps

Movement	WB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	LT	R	L	L	T	T	T	T	T	T
Maximum Queue (ft)	396	425	825	425	706	448	479	202	216	202	256	348
Average Queue (ft)	219	350	451	54	482	391	134	54	105	107	149	200
95th Queue (ft)	344	480	707	286	742	512	423	162	200	178	236	305
Link Distance (ft)			853		448	448	448	448	448		708	708
Upstream Blk Time (%)			2		13	4	2	0				
Queuing Penalty (veh)			0		44	14	6	0				
Storage Bay Dist (ft)	400	400		400						470		
Storage Blk Time (%)	0	2	14	0								
Queuing Penalty (veh)	0	7	81	0								

Intersection: 8: # MD 713 & MD 100 Westbound Ramps

Movement	SB
Directions Served	R
Maximum Queue (ft)	371
Average Queue (ft)	102
95th Queue (ft)	314
Link Distance (ft)	708
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 9: # MD 713 & MD 176

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	L	L	TR	L	L	T	T	R	L	T
Maximum Queue (ft)	32	118	156	194	64	69	101	134	133	102	56	113
Average Queue (ft)	5	44	66	105	18	21	53	46	49	39	19	48
95th Queue (ft)	22	87	122	170	49	55	87	98	105	83	50	95
Link Distance (ft)		548	782	782			708	708	708	708		1203
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225				400	600					200	
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 9: # MD 713 & MD 176

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	160	30
Average Queue (ft)	75	3
95th Queue (ft)	129	18
Link Distance (ft)	1203	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 6019

Intersection: 1: # MD 713 & MD 175

Movement	EB	EB	EB	EB	EB	B40	B40	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	T	L	L	T	T	T
Maximum Queue (ft)	165	194	246	253	242	646	650	182	480	986	944	915
Average Queue (ft)	89	115	180	182	163	134	218	83	327	797	761	685
95th Queue (ft)	155	176	233	247	235	560	712	162	621	1214	1162	1096
Link Distance (ft)		671	671	671	671	622	622			1059	1059	1059
Upstream Blk Time (%)						2	3			11	6	5
Queuing Penalty (veh)						0	0			0	0	0
Storage Bay Dist (ft)	355							280	280			
Storage Blk Time (%)										48		
Queuing Penalty (veh)										108		

Intersection: 1: # MD 713 & MD 175

Movement	WB	NB	NB	NB	NB	SB	SB	SB	SB	SB	SB	B41
Directions Served	R	L	L	T	T	L	L	T	T	R	R	T
Maximum Queue (ft)	649	300	260	161	142	244	324	404	526	364	352	30
Average Queue (ft)	164	199	161	93	49	132	163	212	242	258	261	2
95th Queue (ft)	784	277	254	153	120	214	279	376	446	376	352	27
Link Distance (ft)	1059	1068	1068	1068	1068			495	495			1864
Upstream Blk Time (%)	2							1	2			
Queuing Penalty (veh)	0							7	20			
Storage Bay Dist (ft)						340	340			340	340	
Storage Blk Time (%)							0	2	2	3	1	
Queuing Penalty (veh)							0	8	15	7	3	

Intersection: 1: # MD 713 & MD 175

Movement	B41
Directions Served	T
Maximum Queue (ft)	63
Average Queue (ft)	8
95th Queue (ft)	75
Link Distance (ft)	1864
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: # MD 713 & Metacomet Rd/Stone Castle Dr

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	70	192	45	106	107	30	155	206
Average Queue (ft)	20	94	10	21	20	4	28	45
95th Queue (ft)	52	167	34	67	67	20	97	136
Link Distance (ft)	411	544		1864	1864		1524	1524
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			150			140		
Storage Blk Time (%)				0			0	
Queuing Penalty (veh)				0			0	

Intersection: 3: # MD 713 & Ridgewood Rd/Severn Rd

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB	B47
Directions Served	LTR	LT	R	L	T	T	R	L	L	T	TR	T
Maximum Queue (ft)	68	497	190	133	345	340	74	122	194	380	364	41
Average Queue (ft)	31	471	175	17	180	177	31	55	99	204	210	2
95th Queue (ft)	64	484	246	78	309	302	61	108	191	354	358	17
Link Distance (ft)	429	453			1147	1147				312	312	1342
Upstream Blk Time (%)		56								2	2	
Queuing Penalty (veh)		0								13	14	
Storage Bay Dist (ft)			165	130			370	170	170			
Storage Blk Time (%)		54	2		24	0		0	0	10		
Queuing Penalty (veh)		398	12		2	0		0	0	18		

Intersection: 3: # MD 713 & Ridgewood Rd/Severn Rd

Movement	B47
Directions Served	T
Maximum Queue (ft)	29
Average Queue (ft)	2
95th Queue (ft)	18
Link Distance (ft)	1342
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: # MD 713 & Watts Ave/Ridge Forest Way

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	146	132	59	188	234	37	168	164
Average Queue (ft)	63	52	14	67	87	7	55	51
95th Queue (ft)	126	104	40	149	179	25	132	126
Link Distance (ft)	308	319		1342	1342		327	327
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			100			195		
Storage Blk Time (%)				2			0	
Queuing Penalty (veh)				1			0	

Intersection: 5: # MD 713 & Teague Rd.

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	LT	R	L	T	T	T	R	L	L
Maximum Queue (ft)	155	87	216	174	324	218	293	347	399	20	180	415
Average Queue (ft)	70	37	137	86	164	52	140	200	249	1	146	208
95th Queue (ft)	130	66	207	172	273	132	271	325	389	8	206	354
Link Distance (ft)	220	220	534	534	534		618	618				462
Upstream Blk Time (%)	0											0
Queuing Penalty (veh)	0											0
Storage Bay Dist (ft)						200			480	480	155	
Storage Blk Time (%)						0	3				8	19
Queuing Penalty (veh)						0	4				18	42

Intersection: 5: # MD 713 & Teague Rd.

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	344	349
Average Queue (ft)	172	170
95th Queue (ft)	319	311
Link Distance (ft)	462	462
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Arundel Mills Blvd. & Arundel Way & # MD 713

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	L	T	T	T
Maximum Queue (ft)	104	82	141	78	109	174	495	496	66	119	81	119
Average Queue (ft)	41	27	62	17	39	55	202	313	22	66	27	44
95th Queue (ft)	82	65	109	51	85	117	495	622	56	112	67	91
Link Distance (ft)	368	368	368	368		462	462	462		1022	1022	1022
Upstream Blk Time (%)							1	2				
Queuing Penalty (veh)							3	10				
Storage Bay Dist (ft)					190				300			
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 6: Arundel Mills Blvd. & Arundel Way & # MD 713

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	L	T	T
Maximum Queue (ft)	160	235	214	221	142	155
Average Queue (ft)	51	130	132	144	60	78
95th Queue (ft)	102	203	201	212	123	140
Link Distance (ft)					880	880
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	300	500	500	500		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: # MD 713 & Bass Pro Dr.

Movement	EB	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	T	R	T	T	T	R	L	L	T	T
Maximum Queue (ft)	129	81	48	58	182	109	106	9	136	351	516	491
Average Queue (ft)	60	28	15	15	65	43	34	0	33	61	191	100
95th Queue (ft)	104	69	43	45	129	93	83	7	92	233	445	337
Link Distance (ft)	299	299	299	299	880	880	880	880		496	496	496
Upstream Blk Time (%)										0	2	1
Queuing Penalty (veh)										0	6	5
Storage Bay Dist (ft)									400			
Storage Blk Time (%)									0	0		
Queuing Penalty (veh)									0	0		

Intersection: 7: # MD 713 & Bass Pro Dr.

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	370	12
Average Queue (ft)	68	0
95th Queue (ft)	275	6
Link Distance (ft)	496	496
Upstream Blk Time (%)	1	
Queuing Penalty (veh)	3	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: # MD 713 & MD 100 Westbound Ramps

Movement	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	LT	L	L	T	T	T	T	T	T	R
Maximum Queue (ft)	176	199	194	321	304	128	171	217	181	196	218	259
Average Queue (ft)	47	115	94	170	142	39	59	107	96	110	94	47
95th Queue (ft)	134	181	159	286	263	89	130	186	167	177	176	176
Link Distance (ft)			853	448	448	448	448	448		705	705	705
Upstream Blk Time (%)					0							
Queuing Penalty (veh)					0							
Storage Bay Dist (ft)	400	400							470			
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 9: # MD 713 & MD 176

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	L	L	TR	L	L	T	T	R	L	T
Maximum Queue (ft)	94	163	324	502	374	156	180	285	296	173	89	188
Average Queue (ft)	36	73	130	250	140	79	100	166	181	55	26	75
95th Queue (ft)	79	134	236	418	269	137	150	255	271	118	63	142
Link Distance (ft)		548	782	782			705	705	705	705		1203
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225				400	600					200	
Storage Blk Time (%)				1	0							0
Queuing Penalty (veh)				3	0							0

Intersection: 9: # MD 713 & MD 176

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	270	120
Average Queue (ft)	136	21
95th Queue (ft)	234	71
Link Distance (ft)	1203	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)	1	
Queuing Penalty (veh)	0	

Zone Summary

Zone wide Queuing Penalty: 724

Intersection: 1: # MD 713 & MD 175

Movement	EB	EB	EB	EB	EB	B40	B40	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	T	L	L	T	T	T
Maximum Queue (ft)	287	324	338	343	328	648	648	156	480	1053	1032	981
Average Queue (ft)	189	212	245	262	242	214	170	61	358	935	899	834
95th Queue (ft)	269	301	304	324	311	708	628	130	658	1222	1217	1214
Link Distance (ft)		671	671	671	671	622	622			1059	1059	1059
Upstream Blk Time (%)						2	2			24	17	17
Queuing Penalty (veh)						0	0			0	0	0
Storage Bay Dist (ft)	355							280	280			
Storage Blk Time (%)	0	0								68		
Queuing Penalty (veh)	0	0								98		

Intersection: 1: # MD 713 & MD 175

Movement	WB	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R	L	L	T	T	R	R
Maximum Queue (ft)	650	421	448	781	807	377	352	363	481	288	248	245
Average Queue (ft)	448	209	183	509	515	223	269	284	205	135	106	135
95th Queue (ft)	1318	321	360	891	947	544	379	388	509	235	248	255
Link Distance (ft)	1059	1068	1068	1068	1068				495	495		
Upstream Blk Time (%)	11				2				9	0		
Queuing Penalty (veh)	0				0				57	0		
Storage Bay Dist (ft)						395	340	340			340	340
Storage Blk Time (%)					35	0	4	12	0			
Queuing Penalty (veh)					81	1	4	11	0			

Intersection: 1: # MD 713 & MD 175

Movement	B41	B41
Directions Served	T	T
Maximum Queue (ft)	135	73
Average Queue (ft)	42	3
95th Queue (ft)	224	54
Link Distance (ft)	1864	1864
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: # MD 713 & Metacomet Rd/Stone Castle Dr

Movement	EB	WB	NB	NB	NB	B41	B41	B41	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	T	T		L	T	TR
Maximum Queue (ft)	71	111	109	251	275	235	327	8	132	134	114
Average Queue (ft)	22	43	20	50	84	13	13	1	48	31	27
95th Queue (ft)	56	93	62	156	211	126	138	8	100	92	80
Link Distance (ft)	411	544		1864	1864	495	495	495		1524	1524
Upstream Blk Time (%)						0	0				
Queuing Penalty (veh)						0	0				
Storage Bay Dist (ft)			150						140		
Storage Blk Time (%)				0					0	0	
Queuing Penalty (veh)				0					2	0	

Intersection: 3: # MD 713 & Ridgewood Rd/Severn Rd

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB	B47
Directions Served	LTR	LT	R	L	T	T	R	L	L	T	TR	T
Maximum Queue (ft)	57	507	190	129	487	549	395	183	195	399	367	446
Average Queue (ft)	21	450	189	13	280	291	218	174	190	345	241	166
95th Queue (ft)	52	556	195	59	410	443	397	201	215	463	390	417
Link Distance (ft)	425	454			1147	1147				303	303	1342
Upstream Blk Time (%)		39								24	3	
Queuing Penalty (veh)		0								226	25	
Storage Bay Dist (ft)			165	130			370	170	170			
Storage Blk Time (%)		23	40		35	2	1	19	31	4		
Queuing Penalty (veh)		148	80		3	11	6	119	195	25		

Intersection: 3: # MD 713 & Ridgewood Rd/Severn Rd

Movement	B47
Directions Served	T
Maximum Queue (ft)	394
Average Queue (ft)	81
95th Queue (ft)	289
Link Distance (ft)	1342
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: # MD 713 & Watts Ave/Ridge Forest Way

Movement	EB	WB	NB	NB	NB	SB	SB	SB	B48	B48
Directions Served	LTR	LTR	L	T	TR	L	T	TR	T	T
Maximum Queue (ft)	76	276	124	265	307	219	341	326	8	15
Average Queue (ft)	32	146	37	144	164	51	157	143	0	1
95th Queue (ft)	68	239	88	248	269	124	290	279	6	9
Link Distance (ft)	308	319		1342	1342		327	327	1064	1064
Upstream Blk Time (%)		1					0	0		
Queuing Penalty (veh)		0					2	2		
Storage Bay Dist (ft)			100			195				
Storage Blk Time (%)			0	12			4			
Queuing Penalty (veh)			1	9			3			

Intersection: 5: # MD 713 & Teague Rd.

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	LT	R	L	T	T	T	R	L	L
Maximum Queue (ft)	265	211	439	486	558	225	411	388	382	125	180	475
Average Queue (ft)	220	79	199	295	431	122	214	227	251	50	167	315
95th Queue (ft)	286	165	329	624	662	233	344	338	352	111	201	478
Link Distance (ft)	220	220	534	534	534		618	618				462
Upstream Blk Time (%)	73	0	0	14	32							1
Queuing Penalty (veh)	0	0	0	0	0							4
Storage Bay Dist (ft)						200			480	480	155	
Storage Blk Time (%)						3	7	0	0		32	42
Queuing Penalty (veh)						12	11	0	0		72	93

Intersection: 5: # MD 713 & Teague Rd.

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	493	484
Average Queue (ft)	394	385
95th Queue (ft)	537	527
Link Distance (ft)	462	462
Upstream Blk Time (%)	4	4
Queuing Penalty (veh)	22	21
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Arundel Mills Blvd. & Arundel Way & # MD 713

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	L	T	T	T
Maximum Queue (ft)	254	276	267	231	215	374	446	492	203	334	491	587
Average Queue (ft)	127	155	153	101	168	194	258	306	55	199	258	322
95th Queue (ft)	209	235	240	202	228	294	416	555	134	316	430	528
Link Distance (ft)	354	354	354	354		462	462	462		1022	1022	1022
Upstream Blk Time (%)						0	0	1				
Queuing Penalty (veh)						0	1	3				
Storage Bay Dist (ft)					190				300			
Storage Blk Time (%)					4	11				2		11
Queuing Penalty (veh)					9	24				1		49

Intersection: 6: Arundel Mills Blvd. & Arundel Way & # MD 713

Movement	NB	SB	SB	SB	SB	SB	SB
Directions Served	R	L	L	L	T	T	R
Maximum Queue (ft)	325	362	389	390	274	224	16
Average Queue (ft)	260	229	250	253	114	125	1
95th Queue (ft)	385	355	380	387	215	203	11
Link Distance (ft)					881	881	881
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	300	500	500	500			
Storage Blk Time (%)	6	0	0	1			
Queuing Penalty (veh)	13	0	1	2			

Intersection: 7: # MD 713 & Bass Pro Dr.

Movement	EB	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	T	R	T	T	T	R	L	L	T	T
Maximum Queue (ft)	266	230	275	104	335	358	913	830	246	477	649	663
Average Queue (ft)	159	135	141	41	174	155	241	84	76	144	294	248
95th Queue (ft)	238	209	235	82	261	273	666	473	172	407	632	655
Link Distance (ft)	314	314	314	314	881	881	881	881		496	496	496
Upstream Blk Time (%)			0				0	0		0	7	6
Queuing Penalty (veh)			0				2	2		1	42	38
Storage Bay Dist (ft)									400			
Storage Blk Time (%)									0	0		
Queuing Penalty (veh)									0	0		

Intersection: 7: # MD 713 & Bass Pro Dr.

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	541	367
Average Queue (ft)	171	41
95th Queue (ft)	503	248
Link Distance (ft)	496	496
Upstream Blk Time (%)	3	0
Queuing Penalty (veh)	20	1
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: # MD 713 & MD 100 Westbound Ramps

Movement	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	LT	L	L	T	T	T	T	T	T	R
Maximum Queue (ft)	252	340	355	711	448	595	461	427	237	269	522	421
Average Queue (ft)	152	212	230	447	356	200	131	173	130	153	169	100
95th Queue (ft)	244	292	326	763	532	522	359	312	212	229	327	294
Link Distance (ft)			853	448	448	448	448	448		708	708	708
Upstream Blk Time (%)				17	7	6	0	0			0	
Queuing Penalty (veh)				75	31	26	2	2			0	
Storage Bay Dist (ft)	400	400							470			
Storage Blk Time (%)		0	0									
Queuing Penalty (veh)		0	0									

Intersection: 9: # MD 713 & MD 176

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	TR	L	L	T	T	R	L
Maximum Queue (ft)	250	579	458	220	340	209	201	212	192	210	240	194
Average Queue (ft)	147	442	168	122	201	97	128	144	118	130	98	25
95th Queue (ft)	311	675	586	210	307	173	189	201	177	192	182	98
Link Distance (ft)		548	548	782	782			708	708	708	708	
Upstream Blk Time (%)		21	5									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	225					400	600					200
Storage Blk Time (%)	0	57			0							
Queuing Penalty (veh)	0	48			0							

Intersection: 9: # MD 713 & MD 176

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	893	929	325
Average Queue (ft)	513	606	179
95th Queue (ft)	1055	1093	419
Link Distance (ft)	1203	1203	
Upstream Blk Time (%)	3	6	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			300
Storage Blk Time (%)	17	49	0
Queuing Penalty (veh)	3	49	0

Zone Summary

Zone wide Queuing Penalty: 1793

Intersection: 1: # MD 713 & MD 175

Movement	EB	EB	EB	EB	EB	B40	B40	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	T	L	L	T	T	T
Maximum Queue (ft)	339	383	227	228	221	513	634	79	126	537	484	417
Average Queue (ft)	208	241	159	151	122	55	71	12	60	365	333	262
95th Queue (ft)	314	345	223	217	198	350	400	46	110	485	444	379
Link Distance (ft)		671	671	671	671	622	622			1059	1059	1059
Upstream Blk Time (%)						0	0					
Queuing Penalty (veh)						0	0					
Storage Bay Dist (ft)	355							280	280			
Storage Blk Time (%)	0	1								22		
Queuing Penalty (veh)	0	2								18		

Intersection: 1: # MD 713 & MD 175

Movement	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB	SB	
Directions Served	L	L	T	T	R	L	L	T	T	R	R	
Maximum Queue (ft)	165	145	169	152	39	284	285	230	239	260	253	
Average Queue (ft)	97	47	101	67	1	176	188	106	126	100	131	
95th Queue (ft)	162	118	160	144	20	257	268	193	203	241	244	
Link Distance (ft)	1068	1068	1068	1068				495	495			
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					395	340	340			340	340	
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 2: # MD 713 & Metacomet Rd/Stone Castle Dr

Movement	EB	WB	NB	NB	NB	B41	B41	SB	SB	SB	
Directions Served	LTR	LTR	L	T	TR	T	T	L	T	TR	
Maximum Queue (ft)	60	147	45	141	175	77	5	39	62	73	
Average Queue (ft)	22	56	10	29	43	3	0	12	11	11	
95th Queue (ft)	53	113	34	97	122	47	4	34	41	45	
Link Distance (ft)	411	544		1864	1864	495	495		1524	1524	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			150					140			
Storage Blk Time (%)				0							
Queuing Penalty (veh)				0							

Intersection: 3: # MD 713 & Ridgewood Rd/Severn Rd

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB	B47
Directions Served	LTR	LT	R	L	T	T	R	L	L	T	TR	T
Maximum Queue (ft)	63	493	190	154	392	418	246	182	195	375	233	129
Average Queue (ft)	19	308	180	20	234	237	68	157	166	166	77	10
95th Queue (ft)	51	524	222	88	373	386	161	209	220	385	172	64
Link Distance (ft)	425	453			1147	1147				303	303	1342
Upstream Blk Time (%)		6								6	0	
Queuing Penalty (veh)		0								37	0	
Storage Bay Dist (ft)			165	130			370	170	170			
Storage Blk Time (%)		10	21		29	1	0	4	16	0		
Queuing Penalty (veh)		64	41		3	2	0	19	67	1		

Intersection: 4: # MD 713 & Watts Ave/Ridge Forest Way

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	110	85	62	238	250	104	241	219
Average Queue (ft)	44	33	5	103	115	25	81	70
95th Queue (ft)	84	72	31	213	230	63	186	171
Link Distance (ft)	308	319		1342	1342		327	327
Upstream Blk Time (%)							0	0
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)			100			195		
Storage Blk Time (%)				6			1	
Queuing Penalty (veh)				1			0	

Intersection: 5: # MD 713 & Teague Rd.

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	LT	R	L	T	T	T	R	L	L
Maximum Queue (ft)	220	202	178	160	159	225	363	338	322	44	176	313
Average Queue (ft)	122	83	100	68	72	104	218	219	211	2	51	107
95th Queue (ft)	199	150	170	141	127	224	318	308	297	19	128	228
Link Distance (ft)	220	220	534	534	534		618	618				462
Upstream Blk Time (%)	1	0										
Queuing Penalty (veh)	0	0										
Storage Bay Dist (ft)						200			480	480	155	
Storage Blk Time (%)						0	10				0	1
Queuing Penalty (veh)						0	18				0	1

Intersection: 5: # MD 713 & Teague Rd.

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	447	462
Average Queue (ft)	234	234
95th Queue (ft)	416	420
Link Distance (ft)	462	462
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Arundel Mills Blvd. & Arundel Way & # MD 713

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	TR	L	L	T	R	L	T	T	T
Maximum Queue (ft)	340	356	263	223	215	478	482	461	185	276	267	307
Average Queue (ft)	204	222	157	122	175	292	340	186	79	163	163	186
95th Queue (ft)	313	329	237	210	243	473	492	479	143	246	253	272
Link Distance (ft)	375	375	375	375		462	462	462		1022	1022	1022
Upstream Blk Time (%)	1	1				1	1	1				
Queuing Penalty (veh)	0	0				3	7	7				
Storage Bay Dist (ft)					190				300			
Storage Blk Time (%)					10	22				0		0
Queuing Penalty (veh)					23	48				0		1

Intersection: 6: Arundel Mills Blvd. & Arundel Way & # MD 713

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	L	T	T
Maximum Queue (ft)	302	215	258	258	311	328
Average Queue (ft)	100	114	147	155	149	172
95th Queue (ft)	198	190	225	231	272	286
Link Distance (ft)					881	881
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	300	500	500	500		
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Intersection: 7: # MD 713 & Bass Pro Dr.

Movement	EB	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	T	R	T	T	T	R	L	L	T	T
Maximum Queue (ft)	333	317	315	179	311	398	473	436	109	284	440	680
Average Queue (ft)	264	219	176	72	192	166	143	26	47	66	177	312
95th Queue (ft)	348	315	288	136	299	312	385	209	91	205	360	668
Link Distance (ft)	304	304	304	304	881	881	881	881		496	496	496
Upstream Blk Time (%)	10	6	1				0	0			0	2
Queuing Penalty (veh)	0	0	0				0	0			0	16
Storage Bay Dist (ft)									400			
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 7: # MD 713 & Bass Pro Dr.

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	537	519
Average Queue (ft)	312	188
95th Queue (ft)	611	524
Link Distance (ft)	496	496
Upstream Blk Time (%)	2	1
Queuing Penalty (veh)	17	10
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: # MD 713 & MD 100 Westbound Ramps

Movement	WB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	LT	R	L	L	T	T	T	T	T	T
Maximum Queue (ft)	392	425	722	425	718	448	539	329	222	258	339	376
Average Queue (ft)	222	357	448	34	571	415	225	60	98	114	165	210
95th Queue (ft)	359	475	666	224	829	511	568	181	186	201	273	323
Link Distance (ft)			853		448	448	448	448	448		708	708
Upstream Blk Time (%)			1		24	9	5	0				
Queuing Penalty (veh)			0		83	30	17	0				
Storage Bay Dist (ft)	400	400		400						470		
Storage Blk Time (%)	0	1	14	0								
Queuing Penalty (veh)	0	4	83	0								

Intersection: 8: # MD 713 & MD 100 Westbound Ramps

Movement	SB
Directions Served	R
Maximum Queue (ft)	396
Average Queue (ft)	122
95th Queue (ft)	348
Link Distance (ft)	708
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 9: # MD 713 & MD 176

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	L	L	TR	L	L	T	T	R	L	T
Maximum Queue (ft)	31	100	144	204	74	69	90	123	135	123	56	113
Average Queue (ft)	5	38	65	104	21	19	50	43	51	37	17	43
95th Queue (ft)	22	78	117	173	54	54	82	92	109	83	48	91
Link Distance (ft)		548	782	782			708	708	708	708		1203
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225				400	600					200	
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 9: # MD 713 & MD 176

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	140	30
Average Queue (ft)	73	3
95th Queue (ft)	129	18
Link Distance (ft)	1203	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 626

Appendix F:

Cost Estimate Details

MD 713 (RIDGE ROAD) - SOUTH CORRIDOR

ITEM	CODE		UNIT	PRICE	QUANTITY	AMOUNT
		Category 1 - Preliminary				
		35% of Categories 2, 4, 5, 6	CATEGORY TOTAL			$2,485,769.29
		Category 2 - Grading				
201	201030	Class 1 Excavation	CY	$40.00	47,489	$1,899,560
202	210025	Removal of existing pavement	CY	$50.00	214	$10,711
			CATEGORY TOTAL			$1,910,271
		Category 3 - Drainage				
		15% of Categories 2, 4, 5, 6	CATEGORY TOTAL			$1,065,330
		Category 4 - Structures				
			CATEGORY TOTAL			$1,000,000
		Category 5 - Paving				
501	535100	Milling asphalt pavement 0 inch to 2 inch	SY	$1.50	0	$0
502	585405	5 inch white reflective thermoplastic pavement markings	LF	$1.50	52,943	$79,415
503	585407	5 inch yellow reflective thermoplastic pavement markings	LF	$1.50	5,880	$8,820
504	585408	10 inch white reflective thermoplastic pavement markings	LF	$1.75	1,515	$2,651
505	585410	10 inch yellow reflective thermoplastic pavement markings	LF	$1.75	45	$79
506	585412	12 inch white reflective thermoplastic pavement markings	LF	$2.00	3,940	$7,880
507	585424	24 inch white reflective thermoplastic pavement markings	LF	$7.00	709	$4,963
508	585627	Preformed thermoplastic pavement marking legend and arrows	SF	$25.00	2,252	$56,300
509	504530	2 inch superpave asphalt mix for surface	TON	$80.00	11,095	$887,600
510	504560	3 inch superpave asphalt mix for base	TON	$80.00	5,827	$466,160
511	520111	4 inch graded aggregate base course	SY	$6.00	109,186	$655,115
			CATEGORY TOTAL			$2,168,983
		Category 6 - Shoulders				
601	600000	ADA Ramps (2 ramp set)	EA	$2,500.00	55	$137,500
602	634300	Type A curb and gutter - 12 inch gutter pan 8 inch depth	LF	$35.00	41,253	$1,443,855
603	655105	5 inch concrete sidewalk	SF	$7.00	82,727	$579,089
			CATEGORY TOTAL			$2,022,944
		Category 7 - Landscaping				
		10% of Categories 2, 4, 5, 6	CATEGORY TOTAL			$710,220
		Category 8 - Traffic				
801	800000	Traffic signal - T-intersection	EA	$200,000.00	2	$400,000
802	800000	Traffic signal - Full-intersection	EA	$250,000.00	3	$750,000
803	800000	Relocate roadway utility pole	EA	$3,000.00	2	$6,000
804	800000	Relocate roadway lighting structure	EA	$2,000.00	6	$12,000
805	800000	Relocate traffic signal pole and mast arm	EA	$15,000.00	84	$1,260,000
806	800000	Relocate pedestrian signal pole	EA	$1,200.00	9	$10,800
807	800000	Relocate fire hydrant	EA	$5,000.00	6	$30,000
808	801130	Square perforated tubular steel sign post	EA	$100.00	33	$3,300
809	801135	Square perforated tubular steel anchor bases	EA	$100.00	33	$3,300
810	813023	Relocate existing ground mounted signs	SF	$35.00	35	$1,225
811	801605	Sheet Aluminum Signs	SF	$50.00	145	$7,250
			CATEGORY TOTAL			$2,483,875
					SUB-TOTAL	$13,847,392
				Contingency	25%	$3,461,848
					TOTAL	$17,309,240

Construction Total	$17,310,000
Maintenance of Traffic	$865,500
Right of Way / Easements	$2,551,430
Total Sum	**$20,726,930**