
TRAFFIC IMPACT REPORT TURNBERRY PARCELS P, R, S, & T COMMERCE CITY, COLORADO

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I. INTRODUCTION

A. Project Overview

Catellus Development Corporation is proposing to develop parcels P, Q, R, S, and T (a.k.a. Turnberry Filings 5 & 6) located in the Turnberry PUD in Commerce City, Colorado. The site is currently undeveloped and contains approximately 90.84 acres. The project site is bounded by SH 2 and a light industrial parcel currently within the jurisdictional limits of Adams County to the west, and undeveloped land to the north, east, and south. Upon build-out the development will contain 315 single-family detached homes. Figure 1 graphically illustrates the location of the project site and Figure 2 provides a conceptual site plan for the project.

The proposed Turnberry parcels P, Q, R, S, and T development will have direct access to the adjacent transportation system via the realignment of Revere St./Peoria St. through the development. The realigned Revere St./Peoria St. will intersect 104th Ave. to the north and 96th Ave. to the south in their existing locations. Figure 2 provides a graphical representation of the proposed access points for the development.

B. Purpose of Study

The purpose of this study is to evaluate the impact of the vehicular trips projected to be generated by the proposed Turnberry parcels P, Q, R, S, and T development on the study area intersections and roadway system. The study includes 2018 (existing), 2022 (year of anticipated build-out), and 2040 (long term) analysis horizons.

C. Study Area

The study area encompasses the existing roadway system in the vicinity of the project site. Specifically, the following existing intersections (with analysis node number indicated in parenthesis) were evaluated:

- SH 2/104th Ave. (1)
- 104th Ave./Revere St. (2)
- 104th Ave./Potomac St. (3)
- 96th Ave./Peoria St. (4)

Figure 1 graphically illustrates the location of the study area intersections.

II. EXISTING CONDITIONS

A. Existing Traffic Volumes

Existing (2018) peak hour intersection turning movement traffic volume counts were collected for this study at the following intersections in October, 2018:

- SH 2/104th Ave. (1)
- 104th Ave./Revere St. (2)
- 104th Ave./Potomac St. (3)
- 96th Ave./Peoria St. (4)

Existing (2018) 24-hour directional traffic volumes were collected for this study at the following locations in October 2018:

- SH 2 north of 104th Ave.
- 104th Ave. west of Revere St.
- Revere St. north of 104th Ave.
- Potomac St. north of 104th Ave.

A summary of the existing (2018) peak hour intersection turning movement traffic volume counts and 24-hour directional counts are graphically illustrated in Figure 3. Detailed traffic volume count data is provided in Appendix “A”.

B. Existing Roadway System

The existing transportation network in the vicinity of the proposed development is graphically illustrated in Figure 1. The study area roadways include the following:

Study Area Roadways:

- **SH 2** – SH 2 is a 4-lane divided highway under the jurisdiction of the Colorado Department of Transportation (CDOT). It is classified as a Principal Arterial. The roadway section consists of two travel lanes in each direction with a painted center median and paved shoulder within the study area. There is a detached multi-use path along the east side of the roadway. The posted speed limit is 55 mph.
- **104th Ave.** – 104th Ave., east of SH 2, is 4-lane divided Principal Arterial under the jurisdiction of Commerce City. The roadway section consists of two travel lanes in each direction with a raised center median. There is curb and gutter and detached sidewalks on both sides of the roadway. The posted speed limit is 45 mph.
- **Revere St.** – Revere St., north of 104th Ave., is classified as a Minor/Residential Collector under the jurisdiction of Commerce City. The roadway section consists of two travel lanes in each direction with a raised center median between 104th Ave. and 104th Pl. North of 104th Pl. the roadway section narrows to one travel lane in each direction. There is curb and gutter and detached sidewalks on both sides of the roadway. The posted speed limit is 30 mph.
- **Peoria St.** - Peoria St., between 104th Ave. and 96th Ave., is currently a 2-lane gravel roadway with a posted speed limit of 40mph under the jurisdiction of the City of Commerce City. Based on the *City of Commerce City, C3 Vision, Transportation Plan*, dated July 2010, this segment of Peoria St. is planned to become a Multimodal Arterial Roadway. However, a Major Collector roadway section with a 120-foot right-of-way is being proposed through the Turnberry parcels P, Q, R, S, and T development. Per Commerce City Standard Detail 307-05 the typical section for a Major Collector roadway consists of 1-12-foot travel lane, a 6-foot bike lane, and curb and gutter in each direction with a 12-foot continuous two-way left turn lane in the center. Outside of the curb and gutter each side of the roadway has a 6-foot tree lawn and 5-foot sidewalk. The roadway will be posted for 30mph.
- **96th St.** – 96th St., north of SH 2, is classified as a Minor Arterial under the jurisdiction of Commerce City. Currently, the roadway section is paved and consists of one travel lane in each direction with no shoulders or sidewalks. The posted speed limit is 40mph.
- **Potomac St.** – Potomac St., between 104th Ave. and 96th Ave., is currently a 2-lane gravel roadway with a posted speed limit of 40mph under the jurisdiction of the City of Commerce City. Based on the *City of Commerce City, C3 Vision, Transportation Plan*,

dated July 2010, this segment of Peoria St. is planned to become a Multimodal Arterial roadway. North of 104th Ave. the roadway section has been constructed to the Multimodal Arterial section with a posted speed limit of 40mph.

Study Area Intersections:

- **SH 2/104th Ave.** – The SH 2/104th Ave. intersection is an actuated/coordinated signalized four-legged intersection with protected/permitted left turn phasing on all four approaches. The east leg of the intersection has dual left turn lanes with approximately a total of 750 feet of storage, two through lanes, and one channelized free right turn lane under yield control with approximately 300 feet of storage on the westbound approach and two eastbound departure lanes plus a northbound to eastbound right turn acceleration lane with approximately 800 feet. The west leg of the intersection has dual left turn lanes with approximately a total of 1050 feet of storage, two through lanes, and one channelized free right turn lane under yield control with approximately 880 feet of storage on the eastbound approach and two westbound departure lanes plus a southbound to westbound right turn acceleration lane with of approximately 600 feet. The north leg of the intersection has one left turn lane with approximately 800 feet of storage, two through lanes, and one channelized free right turn lane with approximately 500 feet of storage on the southbound approach and two northbound departure lanes. The south leg of the intersection has one left turn lane with approximately 700 feet of storage, two through lanes, and one channelized free right turn lane with approximately 500 feet of storage on the northbound approach and two southbound departure lanes.
- **104th Ave./Revere St.** – At the time of the traffic counts (October 2018), the 104th Ave./Revere St. intersection was a full movement four-legged intersection with stop sign control on the northbound and southbound approaches. Since then it has become a signalized, actuated-coordinated four-legged intersection. The east leg of the intersection has one turn lane with approximately 375 feet of storage, two through lanes, and one channelized free right turn lane under yield control with approximately 300 feet of storage on the westbound approach and two eastbound departure lanes. The west leg of the intersection has dual left turn lanes with a total of approximately 625 feet of storage, two through lanes, and one channelized free right turn lane with approximately 260 feet of storage on the eastbound approach and two westbound departure lanes. The north leg of the intersection has one left turn lane with approximately 100 feet of storage, one through lane, and one right turn lane on the southbound approach and two northbound departure lanes. The south leg of the intersection has one left turn lane and one shared through/right turn lane on the northbound approach and one southbound departure lane.
- **104th Ave./Potomac St.** – The 104th Ave./Potomac St. intersection is an actuated/coordinated signalized four-legged intersection with protected left turn phasing on all four approaches. However, it is planned to implement protected/permitted left turn phasing on all four approaches in 2019. The east leg of the intersection has one left turn lane with approximately 450 feet of storage, one through lane, and one shared through/right turn lane on the westbound approach and two eastbound departure lanes. The west leg of the intersection has one left turn lane with approximately 575 feet of storage, one through lane, and one shared through/right turn lane on the eastbound approach and two westbound departure lanes. The north leg of the intersection has one left turn lane with approximately 225 feet of storage and one shared through/right turn lane on the southbound approach and one northbound departure lane. The south leg of the intersection has one left turn lane with approximately 100 feet of storage and one shared through/right turn lane on the northbound approach and one southbound departure lane.

- **96th Ave./Peoria St.** – The 96th Ave./Peoria St. intersection is a full movement four-legged intersection with stop sign control on the northbound and southbound approaches. The east leg of the intersection has one left turn lane with approximately 220 feet of storage and one shared through/right turn lane on the westbound approach and one eastbound departure lane. The west leg of the intersection has one left turn lane with approximately 150 feet of storage, one through lane and one right turn lane with approximately 250 feet of storage on the eastbound approach and one westbound departure lane. The north leg of the intersection has one shared left turn/through/right turn lane on the southbound approach and one northbound departure lane. The south leg of the intersection has one shared left turn/through/right turn lane on the northbound approach and one southbound departure lane.

III. BACKGROUND TRAFFIC

A. Background Traffic Volumes

Background traffic volume forecasts for the 2022 (build-out) and 2040 (long term) analysis horizons were developed for this study utilizing the following strategy:

- It is assumed that the Turnberry parcels P, Q, R, S, and T development will be built out by 2022 and contain 315 single-family detached homes.
- It is assumed that peak-hour distribution of background intersection approach traffic (left-turn, through, right-turn) at the study area intersections will remain constant through the 2040 (long term) analysis horizon.
- The traffic volume growth rates for the 2022 (build-out) and 2040 (long term) analysis horizons were computed as follows:
 - Utilizing the data contained in the DRCOG web site it was determined that the average annual traffic volume growth rate for SH 2 at the intersection of 104th Ave. is 3.52%. Therefore, an average annual traffic volume growth rate of 3.52% was selected to forecast the background traffic volumes for the 2022 and 2040 analysis horizons on the study area roadways and intersections. This equates to a 4-year (2018 to 2022) growth factor of 1.1484 and 22-year (2018 to 2040) growth factor of 2.141. These factors were applied to the 2018 (existing) traffic volumes to forecast the 2022 (build-out) and 2040 (long term) background traffic volumes for the study area roadways and intersections within the study area.
 - In order to forecast the 2022 (build-out) and 2040 (long term) background traffic volumes on Revere St. between 104th Ave. and 96th Ave. the following procedure was utilized:
 - 2022 (build-out) background traffic volume – It was assumed that there will be no additional development in place between 104th Ave. and 96th Ave. that would utilize Revere/Peoria realigned roadway through 2022. Therefore, the 2022 (build-out) traffic volume forecast for this segment of Revere/Peoria St. was forecast by applying the 4-year growth factor of 1.1484 to the 2018 (existing) traffic volumes.
 - 2040 (long term) background traffic volume – It was assumed that the undeveloped parcels of land to the north and south of the Turnberry parcels P, Q, R, S, and T development that would contribute traffic to the realigned Revere/Peoria St. would be developed by the 2040. It was also assumed that these undeveloped parcels would be developed with a similar land use (single-family detached housing with a gross density of 3.47 units/acre) as the Turnberry parcels P, Q, R, S, and T development. Therefore, site generated vehicle trips were projected, distributed and assigned to the realigned Revere/Peoria St.

based on this strategy to forecast the 2040 background traffic volumes. Figure 4 graphically illustrates the general locations of these undeveloped parcel areas assumed for these forecasts.

Figures 5 and 6 graphically illustrate the projected background traffic volumes for the 2022 (build-out) and 2040 (long term) analysis horizons, respectively.

B. Background Traffic Operational Analysis

In order to establish a base condition in which to evaluate the impact of the traffic generated by the proposed development on the study area intersections, peak hour capacity analyses were performed for the 2018 (existing), 2022 (build-out), 2040 (long term) analysis horizons background traffic conditions. These analyses utilized the methodologies contained in the *Highway Capacity Manual* 6th Edition (HCM) employing *Synchro 10* software and resulted in a qualitative measure of the operational characteristics of the intersection described by a letter designation ranging from “A” to “F” known as “Level of Service” (LOS). LOS “A” represents free-flow operating conditions, whereas LOS “F” represents excessive congestion and delay. Unsignalized intersection capacity analysis reports a LOS designation for each impeded intersection movement. Signalized intersection capacity analysis reports the overall LOS designation for the intersection as well as for each lane group and approach. LOS “D” is considered the minimum acceptable standard of operation.

The following study area intersections were analyzed:

- SH 2/104th Ave. (1)
- 104th Ave./Revere St. (2)
- 104th Ave./Potomac St. (3)
- 96th Ave./Peoria St. (4)

The results of these background traffic operational analyses are summarized graphically for the 2018 (existing), 2022 (build-out), and 2040 (long term) analysis horizons in Figures 7, 8 and 9, respectively. A summary of the results of the intersection capacity analyses is provided in Table 2 and detailed *Synchro 10* software intersection capacity analysis reports in Appendix “B”.

IV. PROJECT DEVELOPMENT

A. Trip Generation

Project trip generation projections for the proposed Turnberry parcels P, Q, R, S, and T development were forecast utilizing the publication *Trip Generation, 10th Edition*, by the Institute of Transportation Engineers. Estimates of total daily traffic volume and AM and PM peak hour traffic volumes were calculated. Trip generation reductions due to transportation demand management, internal trips, or transit use were not considered.

For the purposes of this study, it is assumed that the subject parcel will be fully developed by 2022 containing 315 single-family detached homes. The proposed development is projected to generate 2,988 new daily vehicle trips of which 228 new trips are projected to be generated during the AM peak hour and 306 new trips are projected to be generated during the PM peak hour. Trip Generation projections are provided in Table 1.

**TABLE 1
TRIP GENERATION**

Trip Generation									
Land Use	Intensity	ITE Code	Daily (vpd)	AM Peak Hour (vph)			PM Peak Hour (vph)		
				Total	In	Out	Total	In	Out
Single-Family Detached Housing	315 DU	210	2988	228	57	171	306	193	113
Grand Total			2,988	228	57	171	306	193	113

B. Trip Distribution

The distribution of the projected vehicle trips generated by the Turnberry parcels P, Q, R, S, and T development was established based on the current and projected future traffic patterns on the surrounding transportation system, efficiency of access to the principal transportation corridors serving the area, and the potential trip origins/destinations for the proposed land use for the subject property. Figure 10 graphically illustrates the project generated trip distribution patterns for the development.

C. Trip Assignment

The vehicular traffic volumes estimated to be generated by the proposed Turnberry parcels P, Q, R, S, and T development were assigned to the study area roadways and intersections utilizing the trip distribution analysis described above. Figure 11 graphically illustrates the site generated trip assignment for the Turnberry parcels P, Q, R, S, and T development.

V. TOTAL TRAFFIC

The total traffic forecasts for the 2022 (build-out), and 2040 (long term) analysis horizon scenarios were computed by combining the background traffic volumes for the respective scenario with the associated projected site generated traffic volumes. Figures 12 and 13 graphically illustrate the total traffic forecasts for the study area intersections for the 2022 (build-out) and 2040 (long term) analysis horizons, respectively.

VI. PROJECT ANALYSIS

A. Operational Analysis

In order to evaluate the traffic impacts of the proposed Turnberry parcels P, Q, R, S, and T development on the study area roadway system, peak hour intersection capacity analyses for total traffic conditions were performed for the 2022 (build-out) and 2040 (long term) analysis horizons at each of the study area intersections (with analysis node number indicated in parenthesis) listed below.

- SH 2/104th Ave. (1)
- 104th Ave./Revere St. (2)
- 104th Ave./Potomac St. (3)
- 96th Ave./Peoria St. (4)
- Peoria Pkwy./102nd Pl. (proposed) (5)
- Peoria Pkwy./Quentin St. (proposed) (6)

- Peoria Pkwy./101st Ave. (proposed) (7)

A narrative of the summary of the analyses and comparison to background traffic conditions for the 2018 (existing), 2022 (build-out), and 2040 (long term) analysis horizons is provided below. The results of the total traffic operational analysis are summarized graphically for the 2022 (build-out), and 2040 (long term) analysis horizons in Figures 14 and 15, respectively. A summary of the results of the intersection capacity analysis is provided in Table 2 and detailed *Synchro 10* software intersection capacity analysis reports are provided in Appendix “B”.

Study Area Intersections – Summary of Results:

- **SH 2/104th Ave. (1)** – The SH 2/104th Ave. intersection is not anticipated to undergo any significant geometric or operational modifications or improvements through the 2040 (long term) analysis horizon. Therefore, the analyses assumed that the intersection will remain under actuated/coordinated signalized control with protected/permitted left turn phasing on all four approaches and the laneage will remain the same. Based on these parameters and the existing and forecast traffic volumes, it is projected that all lane groups as well as the intersection, overall, will operate at acceptable levels of service (LOS “D” or better) through the 2022 (build-out) analysis horizon. Due to the forecast growth in the background traffic volume entering this intersection it is projected that the intersection, overall, as well as multiple lane groups will have unacceptable or failing levels of service (LOS “E” or worse) by the 2040 analysis horizon.
- **104th Ave./Revere St. (2)** – Under the existing (2018) operating conditions the analysis shows that the intersection, overall, is operating at acceptable levels of service. However, the northbound shared left turn/through/right turn movement during the PM peak hour and the southbound left turn and through movements during both the AM and PM peak hours experience failing levels of service. The operation of the northbound and southbound lane groups are projected to continue to deteriorate as traffic volumes grow. The intersection now exists (2020) as a four-legged signalized, actuated-coordinated intersection. It is assumed that by 2022, the 104th Ave./Revere St. intersection will have protected/permitted left turn phasing on all four approaches. The east leg of the intersection will have one left turn lane with a minimum of 375 feet of storage, two through lanes, and one free right turn lane with approximately 300 feet of storage under yield control on the westbound approach, and two eastbound departure lanes. The west leg of the intersection will have dual left turn lanes with a total of approximately 625 feet of storage, two through lanes, and one free right turn lane with approximately 260 feet of storage on the eastbound approach, and two westbound departure lanes. The north leg of the intersection will not have any modifications and has one left turn lane with approximately 100 feet of storage, one through lane, and one right turn lane on the southbound approach and, two northbound departure lanes. The south leg of the intersection will have one left turn lane with a minimum of 175 feet of storage and one shared through/right turn lane on the northbound approach, and two southbound departure lanes to accommodate the potential for future westbound to southbound dual left turn lanes. Based on these parameters and the forecast traffic volumes, it is projected that the intersection, overall, as well as all lane groups will operate at acceptable levels of service through the 2022 (build-out) analysis horizon. By the 2040 analysis horizon it is projected that the intersection, overall, as well as all lane groups will continue to operate at acceptable levels of service. However, during the PM peak hour the eastbound through, westbound left turn lane, and northbound shared through/right lane groups will deteriorate to unacceptable levels of service. Adding an additional eastbound through lane, westbound left turn lane, and north bound right turn lane would mitigate these poor levels of service. The additional westbound left turn lane could easily

be implemented by restriping the approach. Adding an additional eastbound through lane and northbound right turn lane would require significant roadway widening.

- **104th Ave./Potomac St. (3)** – Under the existing (2018) operating conditions the analysis shows that intersection, overall, is operating at acceptable levels of service. However all four left turn lane groups are operating at failing levels of service with protected only left turn phasing. The City is planning to modify the left turn phasing on all four approaches to protected/permitted phasing in 2019 which will mitigate this problem. Based on this modification and the forecast traffic volumes, it is projected that the intersection, overall, as well as all lane groups will operate at acceptable levels of service through the 2022 (build-out) analysis horizon. By the 2040 analysis horizon it is projected that the intersection, overall, as well as the eastbound left turn and through/right turn lane, westbound through/right turn lane, and southbound left turn lane groups will deteriorate to unacceptable levels of service. This is primarily due to the high forecast east/west through traffic volumes on 104th Ave. Adding an additional eastbound through lane and westbound through lane would mitigate these poor levels of service.
- **96th Ave./Peoria St. (4)** – The 96th Ave./Peoria St. intersection is not anticipated to undergo any significant geometric or operational modifications or improvements through the 2040 (long term) analysis horizon with the exception of paving the north leg of the intersection. Therefore, the analyses assumed that the intersection will remain under stop sign control on the northbound and southbound approaches and the laneage will remain the same. Based on these parameters and the existing and forecast traffic volumes, it is projected that the intersection, overall, as well as all impeded lane groups will operate at acceptable levels of service through the 2022 (build-out) analysis horizon total traffic conditions. It is projected that by the 2040 (long term) analysis horizon that the northbound and southbound lane groups will have failing levels of service and the intersection, overall, will deteriorate to failing levels of service with the addition of the development traffic. These poor levels of service are primarily due to the high forecast east/west through traffic volumes on 96th Ave.
- **Peoria Pkwy./102nd Pl. (5)** – Concurrently, with the construction of the proposed Turnberry parcels P, Q, R, S, and T development the Peoria Pkwy./102nd Pl. intersection will be constructed as a full movement “T” intersection approximately 330 feet from the northern boundary of the site. The intersection will have stop sign control on the eastbound approach. The west leg of the intersection will have one shared left turn/right turn lane on the westbound approach and one eastbound departure lane. The north leg of the intersection will have one shared through/right turn lane on the southbound approach, and one northbound departure lane. The south leg of the intersection will have one left turn lane with a minimum of 50 feet of storage and one through lane on the northbound approach, and one southbound departure lane. Based on these parameters and the forecast traffic volumes, it is projected that all impeded lane groups, as well as the intersection overall, will operate at acceptable levels of service through the 2040 (long term) analysis horizon.
- **Peoria Pkwy./Quentin St. (6)** – Concurrently, with the construction of the proposed Turnberry parcels P, Q, R, S, and T development the Peoria Pkwy./Quentin St. intersection will be constructed as a full movement four legged intersection approximately 500 feet south of the Peoria Pkwy./102nd Pl. intersection. The intersection will have stop sign control on the eastbound and westbound approaches. The east leg of the intersection will have one shared left turn/through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection will have one shared left turn/through/right turn lane on the eastbound approach, and one westbound departure lane. The north leg of the intersection will have one left turn lane

with a minimum of 50 feet of storage and one shared through/right turn lane on the southbound approach, and one northbound departure lane. The south leg of the intersection will have one left turn lane with a minimum of 50 feet of storage and one shared through/right turn lane on the northbound approach, and one southbound departure lane. Based on these parameters and the forecast traffic volumes, it is projected that all impeded lane groups, as well as the intersection overall, will operate at acceptable levels of service through the 2040 (long term) analysis horizon.

- **Peoria Pkwy./101st Ave. (7)** – Concurrently, with the construction of the proposed Turnberry parcels P, Q, R, S, and T development the Peoria Pkwy./101st Ave. intersection will be constructed as a full movement four legged intersection approximately 737 feet south of the Peoria Pkwy./Quentin St. intersection. The intersection will have stop sign control on the eastbound and westbound approaches. The east leg of the intersection will have one shared left turn/through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection will have one shared left turn/through/right turn lane on the eastbound approach, and one westbound departure lane. The north leg of the intersection will have one left turn lane with a minimum of 50 feet of storage and one shared through/right turn lane on the southbound approach, and one northbound departure lane. The south leg of the intersection will have one left turn lane with a minimum of 50 feet of storage and one shared through/right turn lane on the northbound approach, and one southbound departure lane. Based on these parameters and the forecast traffic volumes, it is projected that all impeded lane groups, as well as the intersection overall, will operate at acceptable levels of service through the 2040 (long term) analysis horizon.

TABLE 2
SUMMARY OF RESULTS - INTERSECTION CAPACITY ANALYSIS

INTERSECTION	INTERSECTION CONTROL	2018 EXISTING TRAFFIC		2022 BACKGROUND TRAFFIC		2022 TOTAL TRAFFIC		2040 BACKGROUND TRAFFIC		2040 TOTAL TRAFFIC	
		AM PEAK LOS	PM PEAK LOS	AM PEAK LOS	PM PEAK LOS	AM PEAK LOS	PM PEAK LOS	AM PEAK LOS	PM PEAK LOS	AM PEAK LOS	PM PEAK LOS
1. E 104th AVE / SH-2	SIGNALIZED										
a. EB L (Prot+Perm) (Dual)		D	C	D	C	D	C	D	F	D	F
b. EB T		D	D	D	D	D	D	F	F	F	F
c. WB L (Prot+Perm) (Dual)		D	C	D	D	D	D	F	F	F	F
d. WB T		D	D	D	D	D	D	F	F	F	F
e. NB L (Prot+Perm)		B	C	B	C	B	C	F	F	F	F
f. NB T		B	C	B	C	C	C	C	F	C	F
g. SB L (Prot+Perm)		B	C	B	C	B	C	C	D	C	D
h. SB T		C	C	C	C	C	C	E	C	E	C
i. INTERSECTION		D	D	C	C	D	D	E	F	F	F
2. E 104th AVE / REVERE ST	TWSC										
a. EB L (Dual)		B	A	-	-	-	-	-	-	-	-
b. WB L		A	B	-	-	-	-	-	-	-	-
c. NB L/T/R	Stop	D	F	-	-	-	-	-	-	-	-
d. NB L	Stop	-	-	-	-	-	-	-	-	-	-
e. NB T/R	Stop	-	-	-	-	-	-	-	-	-	-
f. SB L	Stop	F	F	-	-	-	-	-	-	-	-
g. SB T	Stop	E	F	-	-	-	-	-	-	-	-
h. SB R	Stop	B	B	-	-	-	-	-	-	-	-
i. INTERSECTION		A	A	-	-	-	-	-	-	-	-
2a. E 104th AVE / REVERE ST	SIGNALIZED										
a. EB L (Prot+Perm) (Dual)		-	-	C	C	C	B	C	B	C	B
b. EB T		-	-	D	C	C	C	C	C	C	F
c. WB L (Prot+Perm)		-	-	C	C	C	C	B	D	B	F
d. WB T		-	-	D	C	D	C	D	B	D	B
e. NB L (Prot+Perm)		-	-	B	C	B	C	C	D	D	D
f. NB T/R		-	-	B	C	C	C	D	D	D	E
g. SB L (Prot+Perm)		-	-	B	C	B	C	C	D	D	D
h. SB T		-	-	B	C	C	C	D	D	D	D
i. SB R		-	-	B	C	C	C	D	D	D	D
J INTERSECTION		-	-	D	C	D	C	C	C	C	D

TABLE 2 (CONTINUED)
SUMMARY OF RESULTS - INTERSECTION CAPACITY ANALYSIS

INTERSECTION	INTERSECTION CONTROL	2018 EXISTING TRAFFIC		2022 BACKGROUND TRAFFIC		2022 TOTAL TRAFFIC		2040 BACKGROUND TRAFFIC		2040 TOTAL TRAFFIC	
		AM PEAK LOS	PM PEAK LOS	AM PEAK LOS	PM PEAK LOS	AM PEAK LOS	PM PEAK LOS	AM PEAK LOS	PM PEAK LOS	AM PEAK LOS	PM PEAK LOS
3. E 104TH AVE / POTOMAC ST	SIGNALIZED										
a. EB L (Prot)		F	E	-	-	-	-	-	-	-	-
b. EB T/R		C	C	-	-	-	-	-	-	-	-
c. WB L (Prot)		F	F	-	-	-	-	-	-	-	-
d. WB T/R		C	C	-	-	-	-	-	-	-	-
e. NB L (Prot)		F	F	-	-	-	-	-	-	-	-
f. NB T/R		C	C	-	-	-	-	-	-	-	-
g. SB L (Prot)		F	F	-	-	-	-	-	-	-	-
h. SB T/R		C	C	-	-	-	-	-	-	-	-
i. INTERSECTION		D	D	-	-	-	-	-	-	-	-
3a. E 104TH AVE / POTOMAC ST	SIGNALIZED										
a. EB L (Prot+Perm)		-	-	B	B	C	B	C	D	C	F
b. EB T/R		-	-	C	C	B	C	C	F	C	F
c. WB L (Prot+Perm)		-	-	B	B	B	B	B	C	B	C
d. WB T/R		-	-	C	C	C	C	F	F	F	F
e. NB L (Prot+Perm)		-	-	C	C	C	C	C	C	C	C
f. NB T/R		-	-	C	C	C	C	C	C	C	C
g. SB L (Prot+Perm)		-	-	C	C	C	C	D	D	D	E
h. SB T/R		-	-	C	C	C	C	C	C	C	C
i. INTERSECTION		-	-	C	C	C	C	F	F	F	F
4. E 96TH AVE / PEORIA ST.	TWSC										
a. EB L		A	A	A	A	A	A	B	B	B	B
b. WB L		A	A	A	A	A	A	A	B	A	B
c. NB L/T/R	Stop	A	C	A	C	A	C	A	F	A	F
d. SB L/T/R	Stop	A	B	A	B	C	C	F	F	F	F
e. INTERSECTION		A	A	A	A	A	A	C	D	F	F
5. PEORIA PKWY/E. 102ND PL	TWSC										
a. EB L/R	Stop	-	-	-	-	A	A	-	-	B	B
b. NB L		-	-	-	-	A	A	-	-	A	A
c. INTERSECTION		-	-	-	-	A	A	-	-	A	A
6. PEORIA PKWY/QUENTIN ST.	TWSC										
a. EB L/T/R	Stop	-	-	-	-	A	A	-	-	B	B
b. WB L/T/R	Stop	-	-	-	-	A	A	-	-	B	B
c. NB L		-	-	-	-	A	A	-	-	A	A
d. SB L		-	-	-	-	A	A	-	-	A	A
e. INTERSECTION		-	-	-	-	A	A	-	-	A	A
7. PEORIA PKWY/E. 101ST AVE.	TWSC										
a. EB L/T/R	Stop	-	-	-	-	A	A	-	-	B	B
b. WB L/T/R	Stop	-	-	-	-	A	A	-	-	B	B
c. NB L		-	-	-	-	A	A	-	-	A	A
d. SB L		-	-	-	-	A	A	-	-	A	A
e. INTERSECTION		-	-	-	-	A	A	-	-	A	A

B. Queuing Analysis

Queue lengths and associated storage requirements for auxiliary lanes (turn bays) at the study area intersections were calculated for the 2018 (existing), 2022 (build-out) background and total traffic, and 2040 (long term) background and total traffic scenarios utilizing the *Synchro 10* HCM 2010 95%tile reported queues. The queue length calculations are based on a 25-foot vehicle length. Table 3 provides a summary of these analyses for each of the study area intersections.

A narrative of the summary of the queue length/storage requirement analysis and comparison to existing turn bay storage is provided below.

- **SH 2/104th Ave. (1)** – Based on the results of the queuing analysis it is projected that all of the existing turn bays serving the SH 2/104th Ave. intersection have sufficient capacity to serve the intersection through the 2022 (build-out) analysis horizon. By the 2040 (long term) analysis horizon it is projected that the westbound and northbound left turn

lane queues will exceed their respective turn lane capacities. The capacity of the westbound left turn lanes are restricted by the opposing eastbound left turn lane at Quari Ct. The northbound left turn lane could be expanded by restriping the painted median.

- **104th Ave./Revere St. (2)** – Based on the results of the queuing analysis it is projected that all of the intersection approach left turn and right turn lane storage capacities will have adequate capacity to serve the forecast traffic demand under traffic signal control through the 2040 analysis horizon, with the exception of the southbound left turn lane which will require at least 215 feet of storage by the 2040 analysis horizon.
- **104th Ave./Potomac St. (3)** – Based on the results of the queuing analysis it is projected that the existing eastbound, westbound, northbound, and southbound left turn lanes have adequate capacity in their current configurations to serve the intersection through the 2040 (long term) analysis horizon.
- **96th Ave./Peoria St. (4)** – Based on the results of the queuing analysis it is projected that the eastbound and westbound left turn lanes will have adequate capacity in their current configurations to serve the intersection through the 2040 analysis horizon.
- **Peoria Pkwy./102nd Pl. (5)** – Based on the results of the queuing analysis it is projected that the northbound left turn lane will require a minimum of 50 feet of storage.
- **Peoria Pkwy./Quentin St. (6)** – Based on the results of the queuing analysis it is projected that the northbound and southbound left turn lanes will require a minimum of 50 feet of storage.
- **Peoria Pkwy./101st Ave. (7)** – Based on the results of the queuing analysis it is projected that the northbound and southbound left turn lanes will require a minimum of 50 feet of storage.

TABLE 3
SUMMARY OF QUEUING ANALYSIS

INTERSECTION	EXISTING STORAGE (FT)	INTERSECTION CONTROL	2018 TRAFFIC		2022 BACKGROUND TRAFFIC		2022 TOTAL TRAFFIC		2040 BACKGROUND TRAFFIC		2040 TOTAL TRAFFIC	
			QUEUE LENGTH (FT/LN) 95TH%		QUEUE LENGTH (FT/LN) 95TH%		SYNCHRO QUEUE LENGTH (FT/LN) 95TH%		SYNCHRO QUEUE LENGTH (FT/LN) 95TH%		SYNCHRO QUEUE LENGTH (FT/LN) 95TH%	
			AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK
1. E 104th AVE / SH-2		SIGNALIZED										
a. EB L (Prot+Perm) (Dual)	1050		43	65	50	73	50	70	88	170	88	170
b. EB R (Free/Yield)	880		0	0	0	0	0	0	0	0	0	0
c. WB L (Prot+Perm) (Dual)	750		223	95	243	113	255	68	848	343	903	383
d. WB R (Free/Yield)	300		0	0	0	0	0	0	0	0	0	0
e. NB L (Prot+Perm)	700		78	155	93	260	83	218	360	1968	393	1968
f. SB L (Prot+Perm)	800		18	30	20	38	20	40	43	78	45	83
2. E 104th AVE / REVERE ST		TWSC										
a. EB L (Dual)	625		3	5	-	-	-	-	-	-	-	-
b. WB L	375		0	3	-	-	-	-	-	-	-	-
c. WB R (Free/Yield)	300		0	0	-	-	-	-	-	-	-	-
d. SB L	100	Stop	55	140	-	-	-	-	-	-	-	-
2a. E 104th AVE / REVERE ST		SIGNALIZED										
a. EB L (Prot+Perm) (Dual)	625		-	-	10	23	10	23	15	23	15	30
b. WB L (Prot+Perm)	375		-	-	10	15	20	45	28	128	35	340
c. WB R (Free/Yield)	300		-	-	0	0	0	0	0	0	0	0
d. NB L (Prot+Perm)	-		-	-	3	10	55	53	185	50	260	73
e. SB L (Prot+Perm)	100		-	-	45	68	48	73	123	100	130	213

TABLE 3 (CONTINUED)
SUMMARY OF QUEUING ANALYSIS

INTERSECTION	EXISTING STORAGE (FT)	INTERSECTION CONTROL	2018 TRAFFIC		2022 BACKGROUND TRAFFIC		2022 TOTAL TRAFFIC		2040 BACKGROUND TRAFFIC		2040 TOTAL TRAFFIC	
			QUEUE LENGTH (FT/LN) 95TH%		QUEUE LENGTH (FT/LN) 95TH%		SYNCHRO QUEUE LENGTH (FT/LN) 95TH%		SYNCHRO QUEUE LENGTH (FT/LN) 95TH%		SYNCHRO QUEUE LENGTH (FT/LN) 95TH%	
			AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK
3. E 104TH AVE / POTOMAC ST		SIGNALIZED										
a. EB L (Prot)	575		48	80	-	-	-	-	-	-	-	-
b. WB L (Prot)	450		30	23	-	-	-	-	-	-	-	-
c. NB L (Prot)	200		20	10	-	-	-	-	-	-	-	-
d. SB L (Prot)	-		373	410	-	-	-	-	-	-	-	-
3a. E 104TH AVE / POTOMAC ST		SIGNALIZED										
a. EB L (Prot+Perm)	575		-	-	23	43	23	43	40	125	43	165
b. WB L (Prot+Perm)	450		-	-	13	8	10	8	20	15	20	15
c. NB L (Prot+Perm)	200		-	-	8	3	8	3	15	8	15	8
d. SB L (Prot+Perm)	-		-	-	178	200	185	200	360	378	360	488
4. E 96TH AVE / PEORIA ST.		TWSC										
a. EB L	150		0	0	0	0	0	3	5	13	8	20
b. WB L	220		0	0	0	0	0	0	0	0	0	0
c. NB L/T/R	-	Stop	0	0	0	0	0	0	0	10	0	13
d. SB L/T/R	-	Stop	0	0	0	0	20	18	260	248	423	383
5. PEORIA PKWY/E. 102ND PL		TWSC										
a. EB L/R	-	Stop	-	-	-	-	5	3	-	-	8	8
b. NB L	-		-	-	-	-	0	0	-	-	0	3
6. PEORIA PKWY/QUENTIN ST.		TWSC										
a. EB L/T/R	-	Stop	-	-	-	-	0	0	-	-	3	3
b. WB L/T/R	-	Stop	-	-	-	-	3	3	-	-	5	3
c. NB L	-		-	-	-	-	0	0	-	-	0	0
d. SB L	-		-	-	-	-	0	0	-	-	0	3
7. PEORIA PKWY/E. 101ST AVE.		TWSC										
a. EB L/T/R	-	Stop	-	-	-	-	5	5	-	-	10	8
b. WB L/T/R	-	Stop	-	-	-	-	3	0	-	-	3	3
c. NB L	-		-	-	-	-	0	0	-	-	0	3
d. SB L	-		-	-	-	-	0	0	-	-	0	0

C. Traffic Signal Warrant Analysis

The 104th Ave./Revere St. intersection was evaluated for meeting Traffic Signal Warrants based on the methodologies contained in the *Manual on Uniform Traffic Control Devices, 2009 Edition*. Traffic Signal Warrants 1 (Eight-Hour Vehicular Volume), 2 (Four-Hour Vehicular Volume) and 3 (Peak Hour) were evaluated for existing 2018 traffic conditions and projected 2022 (build-out) and 2040 (long term) analysis horizon background traffic conditions. The 2022 (build-out) and 2040 (long term) analysis horizon background traffic conditions were projected assuming the same hourly volume profile as the 2018 (existing) traffic volume profile. The results of this evaluation are summarized in Table 4, below.

The 96th Ave./Peoria St. intersection was evaluated for meeting Traffic Signal Warrants based on the methodologies contained in the *Manual on Uniform Traffic Control Devices, 2009 Edition*. Traffic Signal Warrant 3 (Peak Hour) was evaluated for existing 2018 traffic conditions and projected 2022 (build-out) and 2040 (long term) analysis horizon total traffic conditions. The results of this evaluation are summarized in Table 5, below. As shown in Table 5 a traffic signal is projected to be warranted based on Warrant 3 (Peak-Hour) by the 2022 (build-out) analysis horizon total traffic scenario. Traffic Signal Warrants 1 – (Eight-Hour) and 2 (Four-Hour) were not included in the analysis due to the lack of traffic volume on the northbound and southbound

approaches of the intersection. It is recommended that as development occurs in this area that this intersection be monitored for meeting additional traffic signal warrant criteria. Traffic Signal Warrant analysis worksheets are provided in Appendix “C”.

TABLE 4
SUMMARY OF TRAFFIC SIGNAL WARRANT ANALYSIS
104TH AVE./REVERE ST. INTERSECTION

Analysis Horizon	Warrant 1 Condition "A" Met?	Warrant 1 Condition "B" Met?	Warrant 2 Met?	Warrant 3 Met?
2018 Existing Traffic AM	NO	NO	YES	YES
2022 Background Traffic AM	NO	YES	YES	YES
2040 Background Traffic AM	NO	YES	YES	YES

TABLE 5
SUMMARY OF TRAFFIC SIGNAL WARRANT ANALYSIS
96TH AVE./PEORIA ST. INTERSECTION

Analysis Horizon	Warrant 3 Met?
2018 Existing Traffic AM	NO
2022 Total Traffic AM	YES
2040 Total Traffic AM	YES

VII. CONCLUSION

Catellus Development Corporation is proposing to develop parcels P, Q, R, S, and T (a.k.a. Filings 5 & 6) located in the Turnberry PUD in Commerce City, Colorado. The site is currently undeveloped and contains approximately 90.84 acres. Upon build-out the development will contain 315 single-family detached homes. The proposed development will have direct access to the adjacent transportation system via the realignment of Revere St./Peoria St. (Peoria Pkwy.) through the development. The realigned Revere St./Peoria St. will intersect 104th Ave. to the north and 96th Ave. to the south in their existing locations. Upon build-out the proposed Turnberry parcels P, Q, R, S, and T development is projected to generate 2,988 new daily vehicle trips of which 228 new trips are projected to be generated during the AM peak hour and 306 new trips are projected to be generated during the PM peak hour.

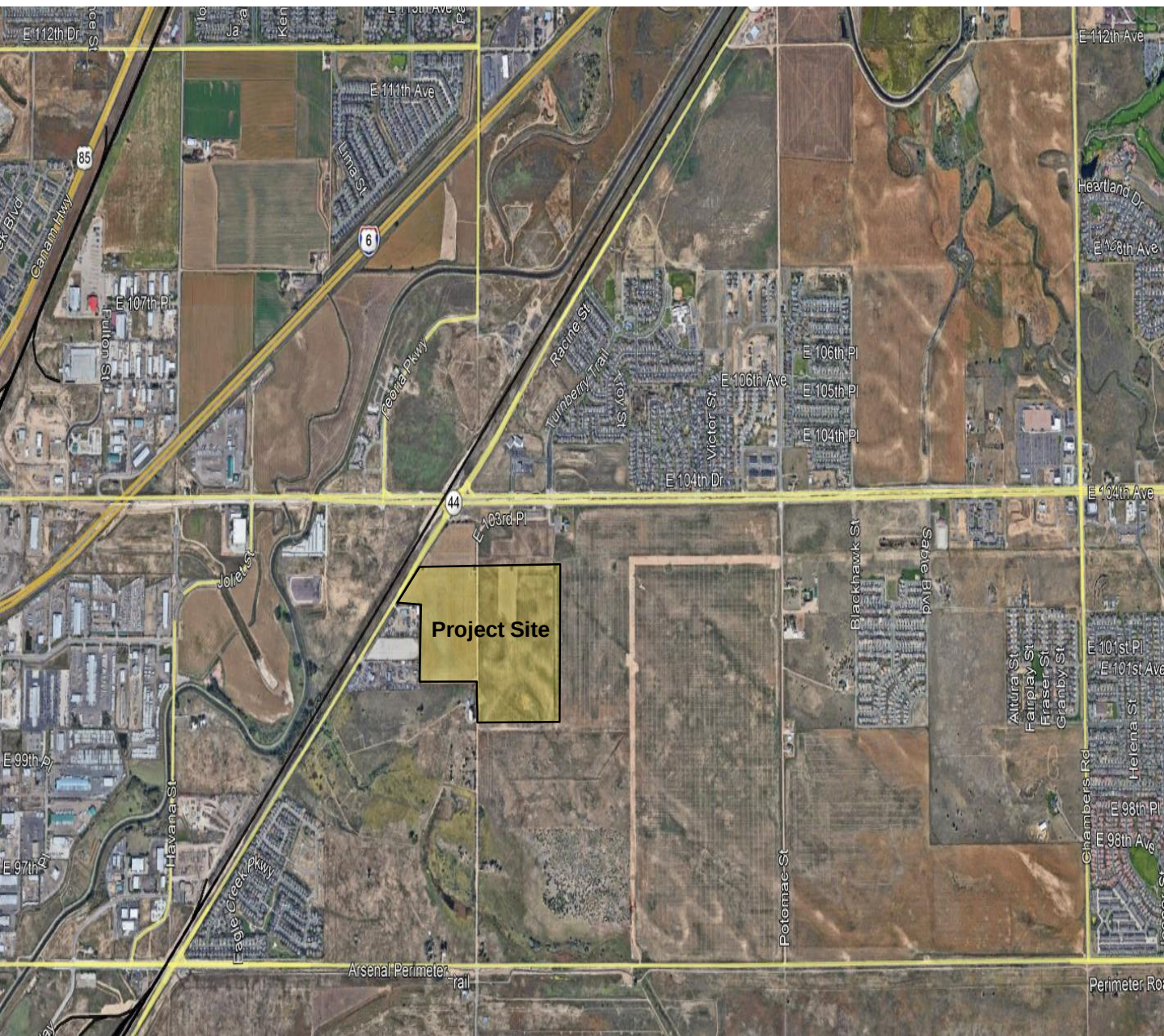
Based on the analyses contained in this traffic study it is concluded that the proposed Turnberry parcels P, Q, R, S, and T development can be accommodated by the study area intersections and roadways through the 2040 (long term) analysis horizon with the modifications presented in Table 6, below.

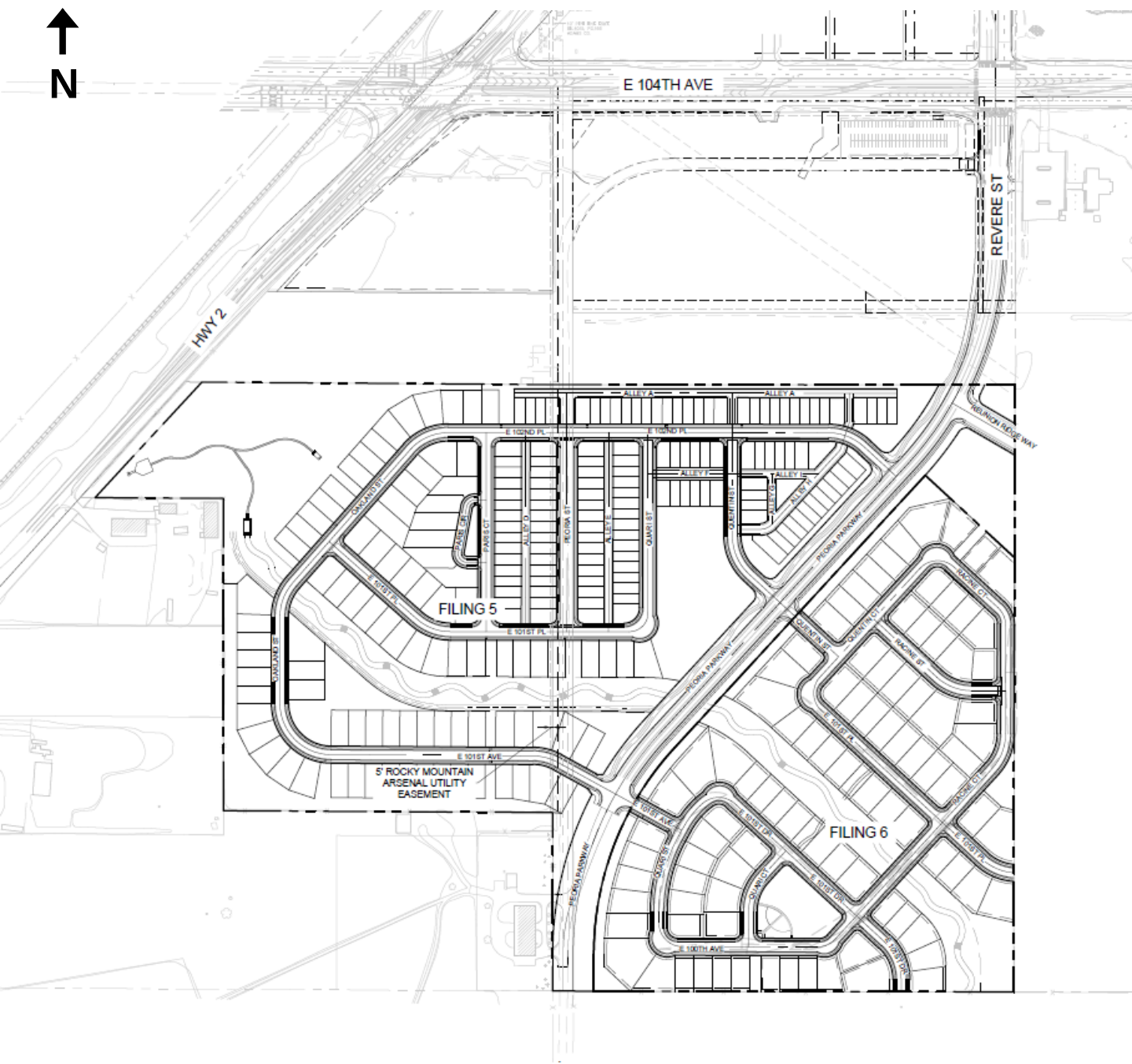
**TABLE 6
SUMMARY OF RECOMMENDATIONS**

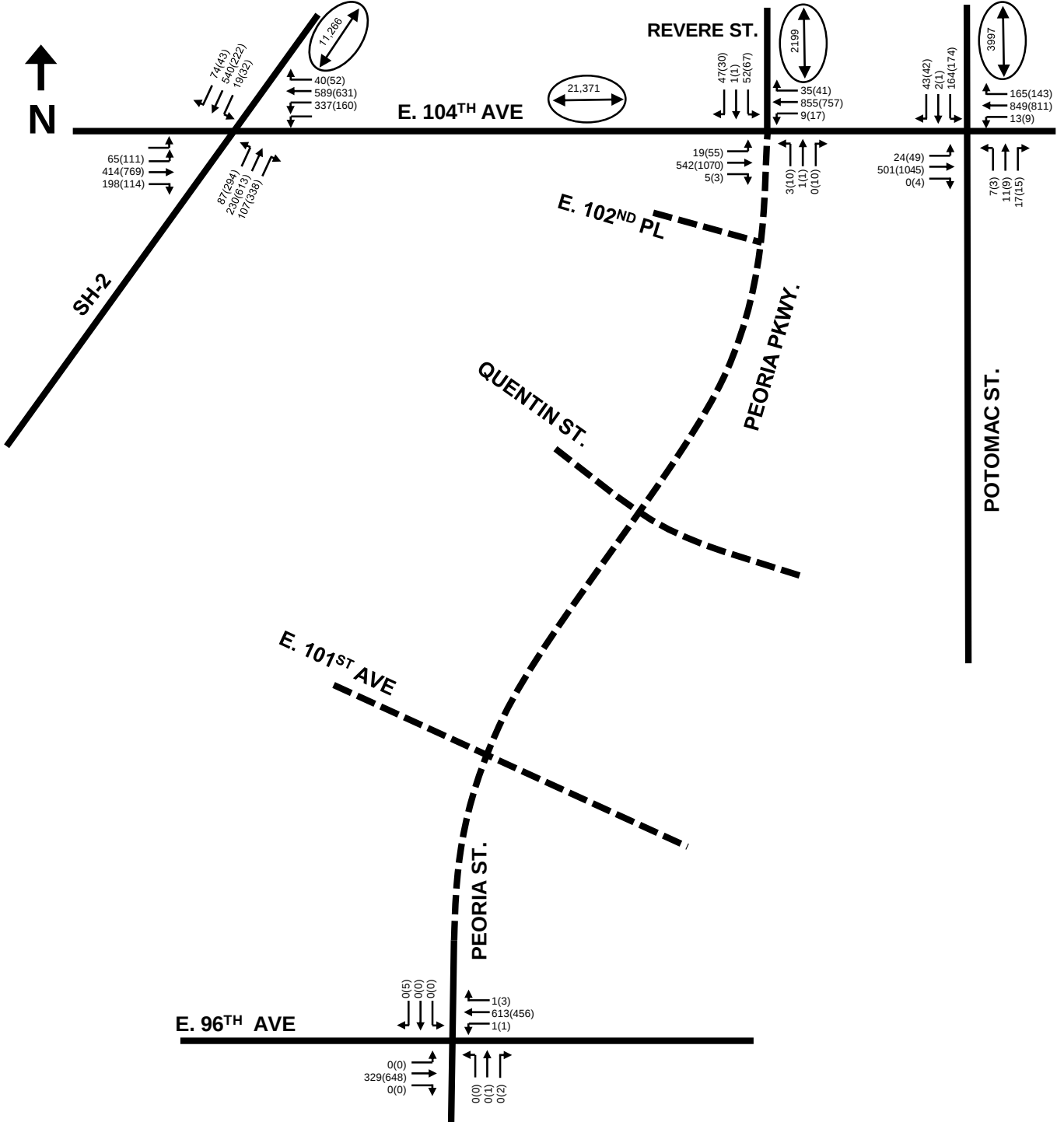
Roadway	Recommendations	Responsible	Timing
Revere St./ Peoria St. (Peoria Pkwy.) (On-Site)	It is recommended that the realignment of Revere/Peoria St. through the proposed Turnberry parcels P, Q, R, S, and T development be constructed as a Major Collector roadway per Commerce City Standard Detail 307-05. The roadway section shall consist of a 120-foot right-of-way containing a 1-12-foot travel lane, a 6-foot bike lane, and curb and gutter in each direction with a 12-foot continuous two-way left turn lane in the center. Outside of the curb and gutter each side of the roadway shall have a 6-foot tree lawn and 5-foot sidewalk. The roadway shall have a posted speed limit of 30mph.	Developer	Concurrently with Project
Revere St./ Peoria St. (Off-Site)	It is anticipated that the realignment of Revere/Peoria St. between 104 th Ave. and 96 th Ave., excluding the Turnberry parcels P, Q, R, S, and T development site, will be constructed as a Major Collector per Commerce City Standard Detail 307-05.	TBD	TBD
Intersection	Recommendations	Responsible	Timing
SH 2/104 th Ave. (1)	No geometric or operational modifications are recommended at this intersection as a result of the development of the proposed Turnberry parcels P, Q, R, S, and T project.	N/A	N/A
104 th Ave./ Revere St. (2)	As development occurs south of 104 th Ave. the intersection should be modified to have actuated/coordinated traffic signal control with protected/permitted left turn phasing on all four approaches. The east leg of the intersection will have one left turn lane with a minimum of 375 feet of storage, two through lanes, and one free right turn lane with approximately 300 feet of storage under yield control on the westbound approach, and two eastbound departure lanes. The west leg of the intersection will have dual left turn lanes with a minimum total of 625 feet of storage, two through lanes, and one free right turn lane with a minimum of 260 feet of storage on the eastbound approach, and two westbound departure lanes. The north leg of the intersection will not require any modifications and has one left turn lane with approximately 100 feet of storage, one through lane, and one right turn lane on the southbound approach and, two northbound departure lanes. The south leg of the intersection will have one left turn lane with a minimum of 175 feet of storage and one shared through/right turn lane on the northbound approach, and two southbound departure lanes to accommodate the potential for future westbound to southbound dual left turn lanes.	TBD	TBD
104 th Ave./ Potomac St. (3)	No geometric or operational modifications are recommended at this intersection as a result of the development of the proposed Turnberry parcels P, Q, R, S, and T project. The City is planning to modify the left turn phasing on all four approaches to protected/permitted phasing in 2019 to improve overall traffic operations.	N/A City	N/A City

TABLE 6 (CONTINUED)
SUMMARY OF RECOMMENDATIONS

Intersection	Recommendations	Responsible	Timing
96 th Ave./ Peoria St. (4)	No geometric or operational modifications are recommended at this intersection as a result of the development of the proposed Turnberry parcels P, Q, R, S, and T project.	N/A	N/A
Peoria Pkwy. /102 nd Pl. (5)	The intersection shall be constructed as a full movement "T" intersection approximately 330 feet from the northern boundary of the site. The intersection will have stop sign control on the eastbound approach. The west leg of the intersection will have one shared left turn/right turn lane on the westbound approach and one eastbound departure lane. The north leg of the intersection will have one shared through/right turn lane on the southbound approach, and one northbound departure lane. The south leg of the intersection will have one left turn lane with a minimum of 50 feet of storage and one through lane on the northbound approach, and one southbound departure lane.	Developer	Concurrently with Project
Peoria Pkwy./ Quentin St. (6)	The intersection shall be constructed as a full movement four-legged intersection approximately 500 feet south of the Peoria Pkwy./102 nd Pl. intersection. The intersection will have stop sign control on the eastbound and westbound approaches. The east leg of the intersection will have one shared left turn/through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection will have one shared left turn/through/right turn lane on the eastbound approach, and one westbound departure lane. The north leg of the intersection will have one left turn lane with a minimum of 50 feet of storage and one shared through/right turn lane on the southbound approach, and one northbound departure lane. The south leg of the intersection will have one left turn lane with a minimum of 50 feet of storage and one shared through/right turn lane on the northbound approach, and one southbound departure lane.	Developer	Concurrently with Project
Peoria Pkwy. /102 nd Pl. (5)	The intersection shall be constructed as a full movement four-legged intersection approximately 737 feet south of the Peoria Pkwy./Quentin St. intersection. The intersection will have stop sign control on the eastbound and westbound approaches. The east leg of the intersection will have one shared left turn/through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection will have one shared left turn/through/right turn lane on the eastbound approach, and one westbound departure lane. The north leg of the intersection will have one left turn lane with a minimum of 50 feet of storage and one shared through/right turn lane on the southbound approach, and one northbound departure lane. The south leg of the intersection will have one left turn lane with a minimum of 50 feet of storage and one shared through/right turn lane on the northbound approach, and one southbound departure lane.	Developer	Concurrently with Project

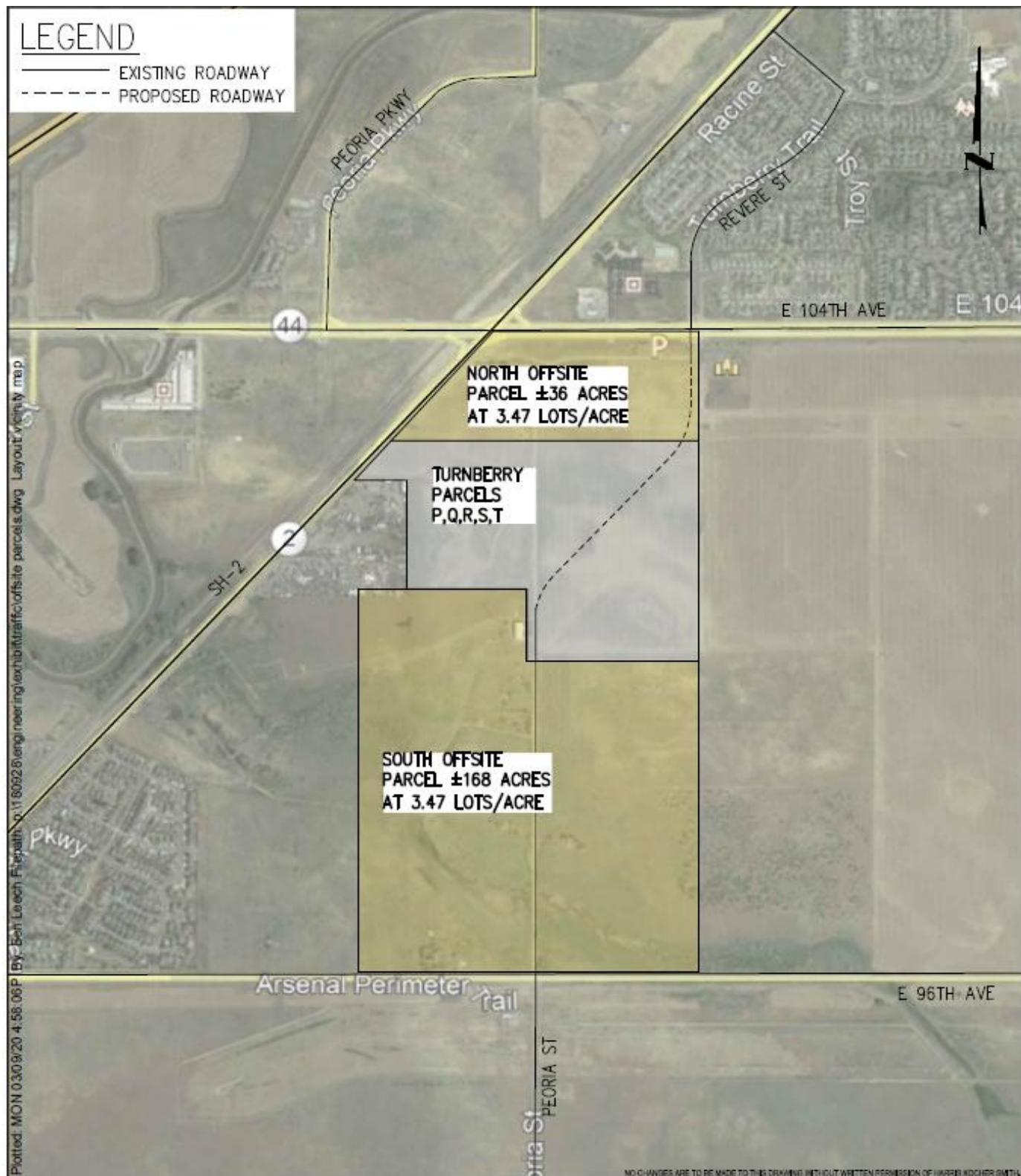


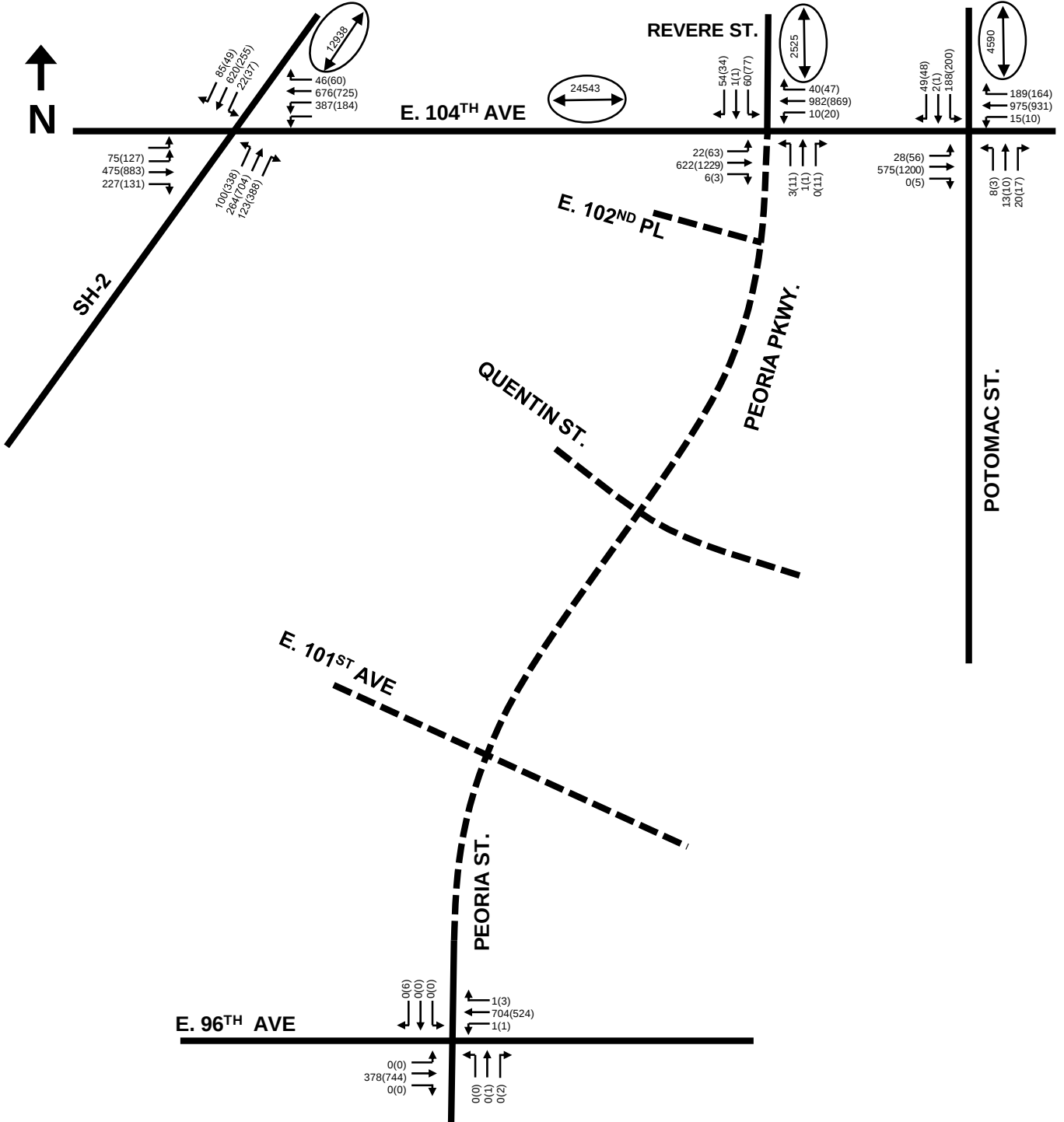




LEGEND

- EXISTING ROADWAY
- - - PROPOSED ROADWAY





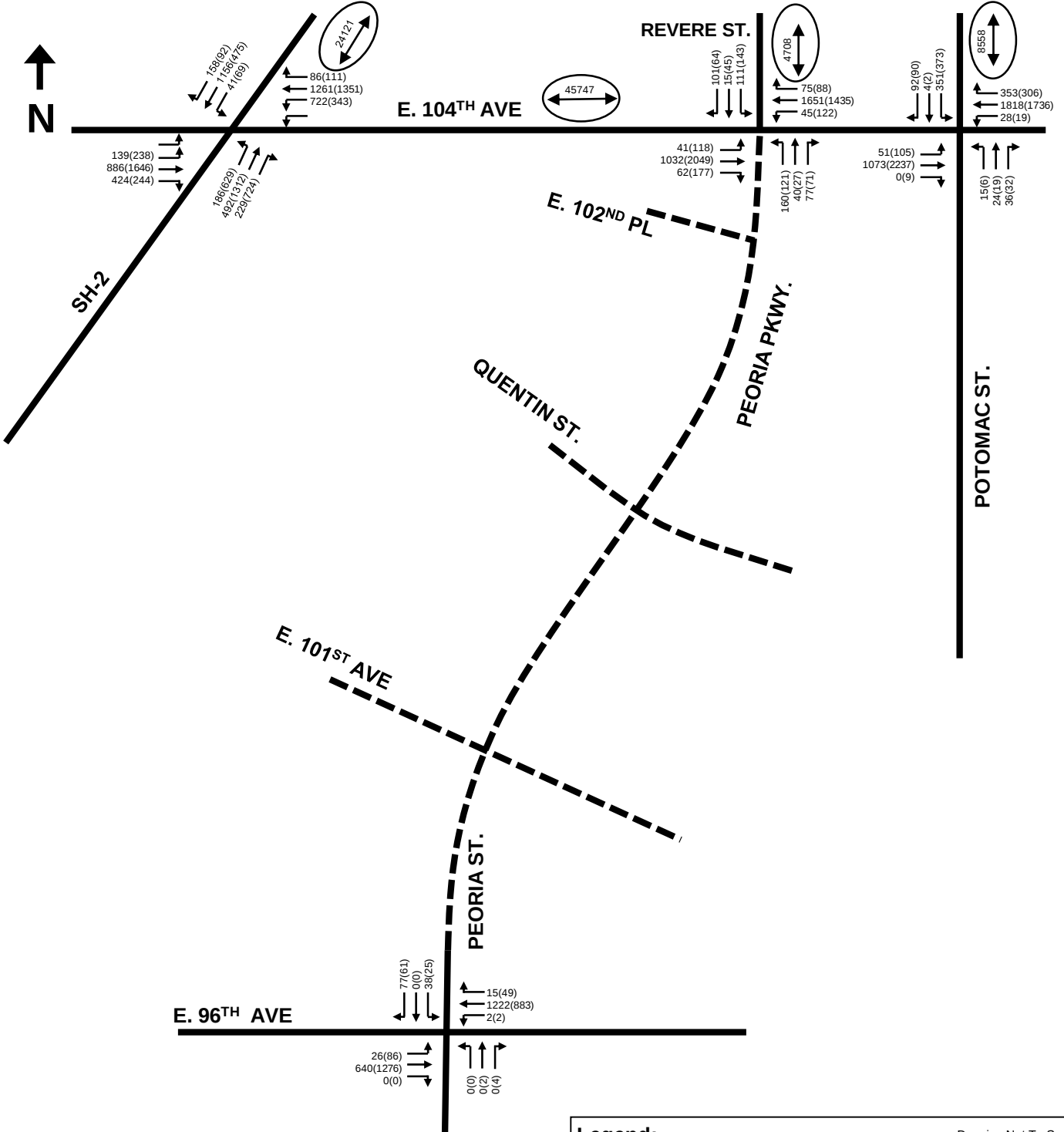
Legend:


 24-Hour Directional
 Volume, vpd

 5(8)
 64(50)
 8(7)

Weekday AM (PM)
 Peak Hour
 Traffic Volumes, vph

Drawing Not To Scale

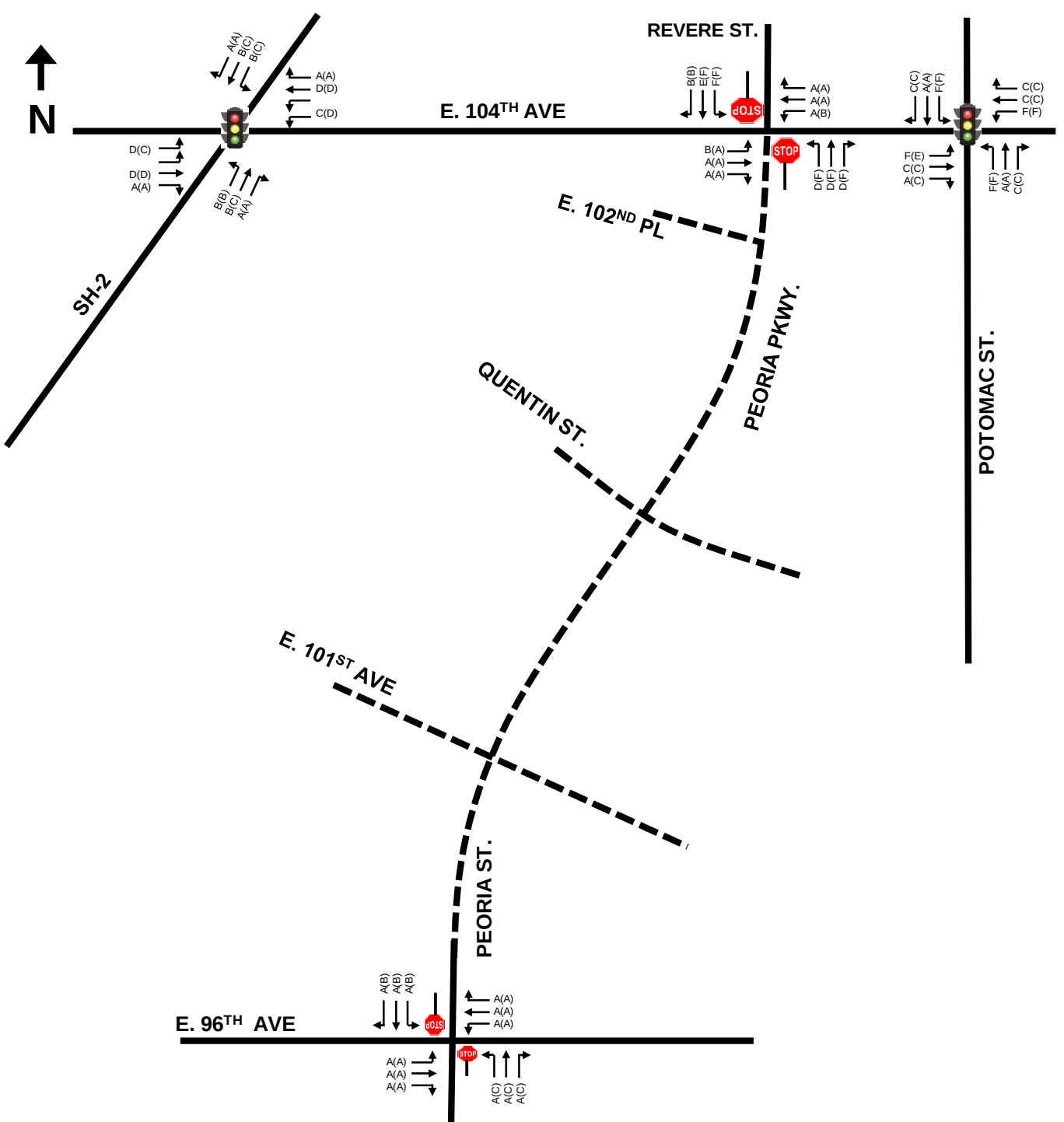


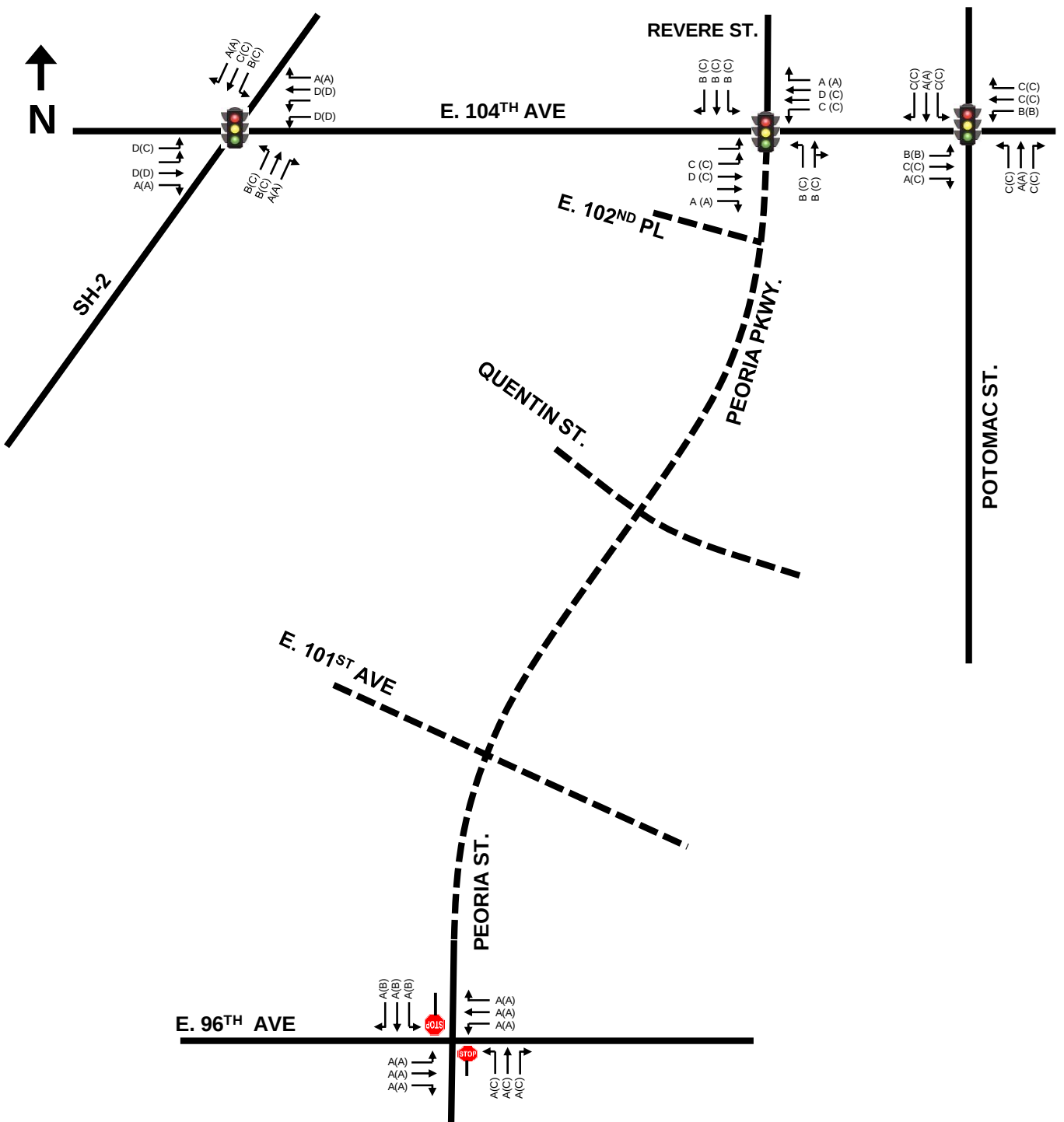
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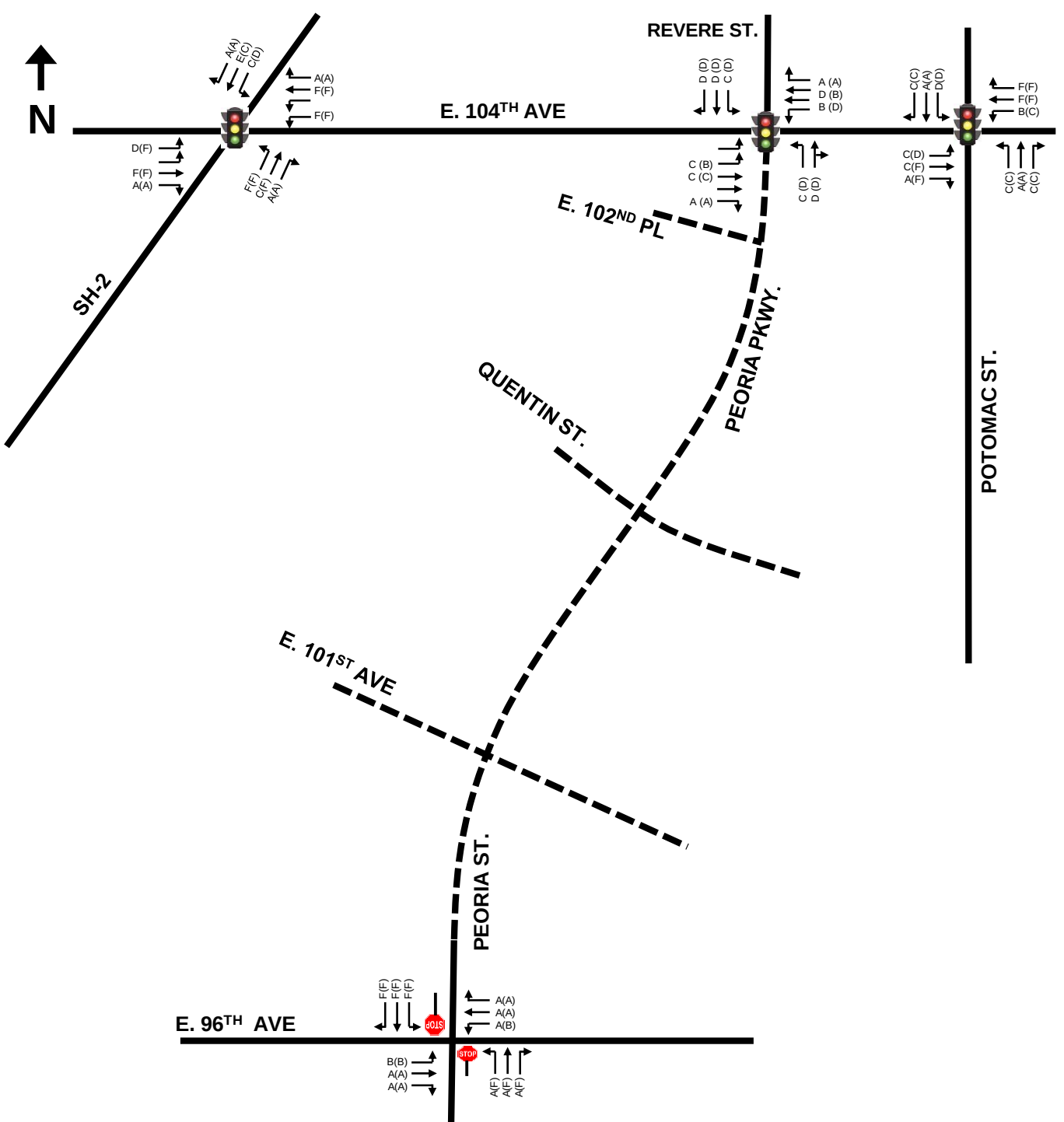

 24-Hour Directional
 Volume, vpd

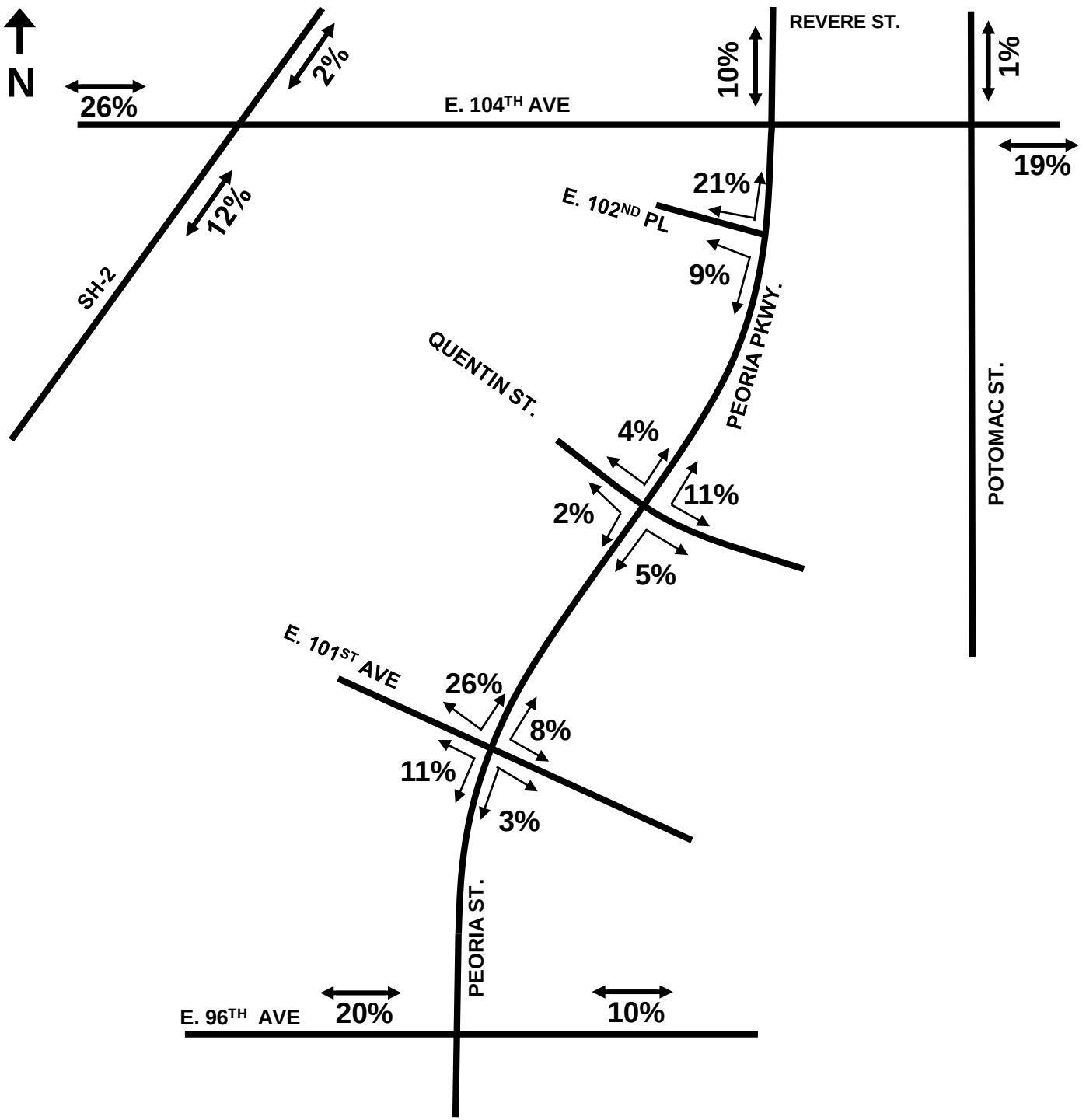
 5(8) Weekday AM (PM)
 64(50) Peak Hour
 8(7) Traffic Volumes, vph

Drawing Not To Scale



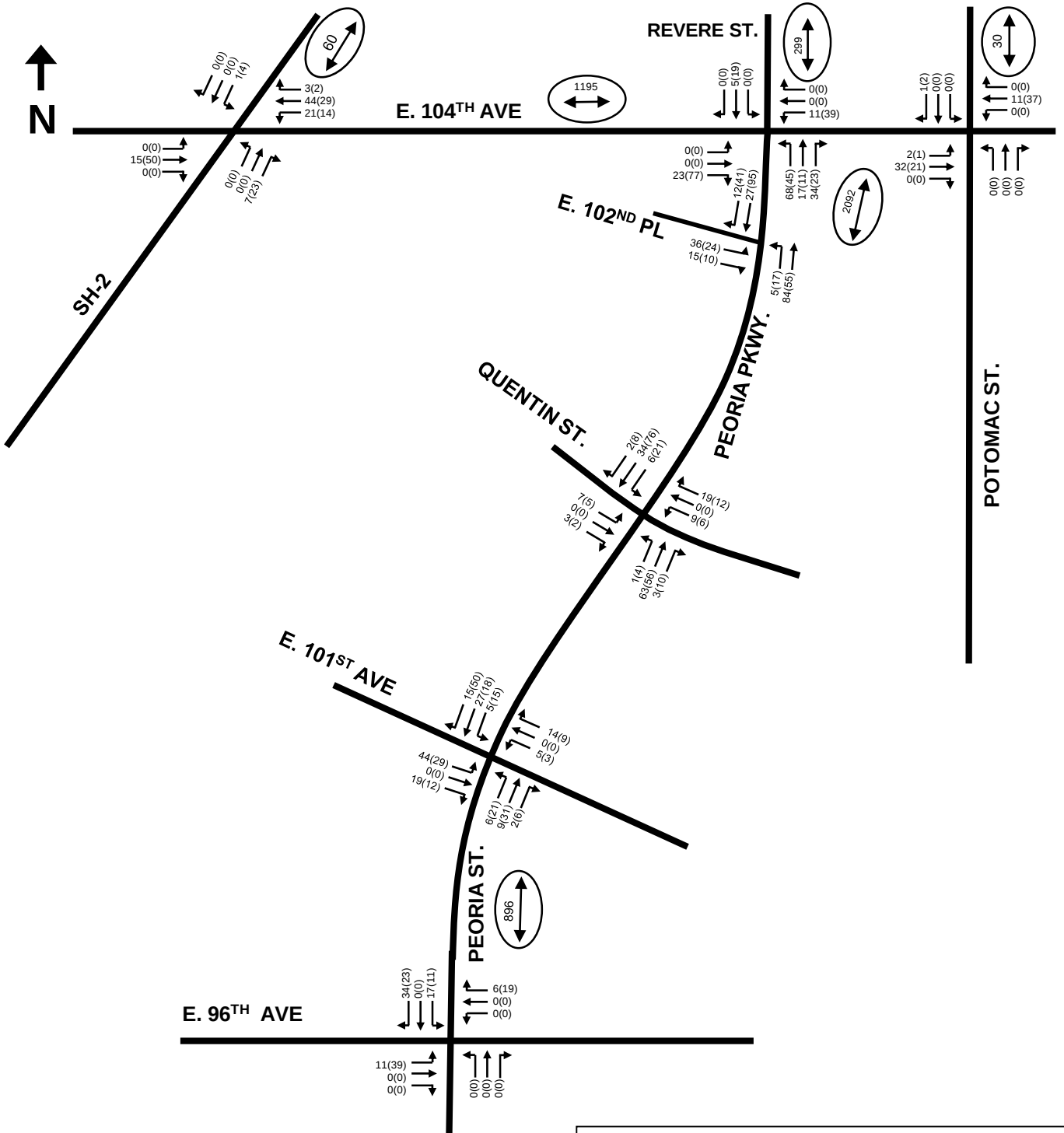


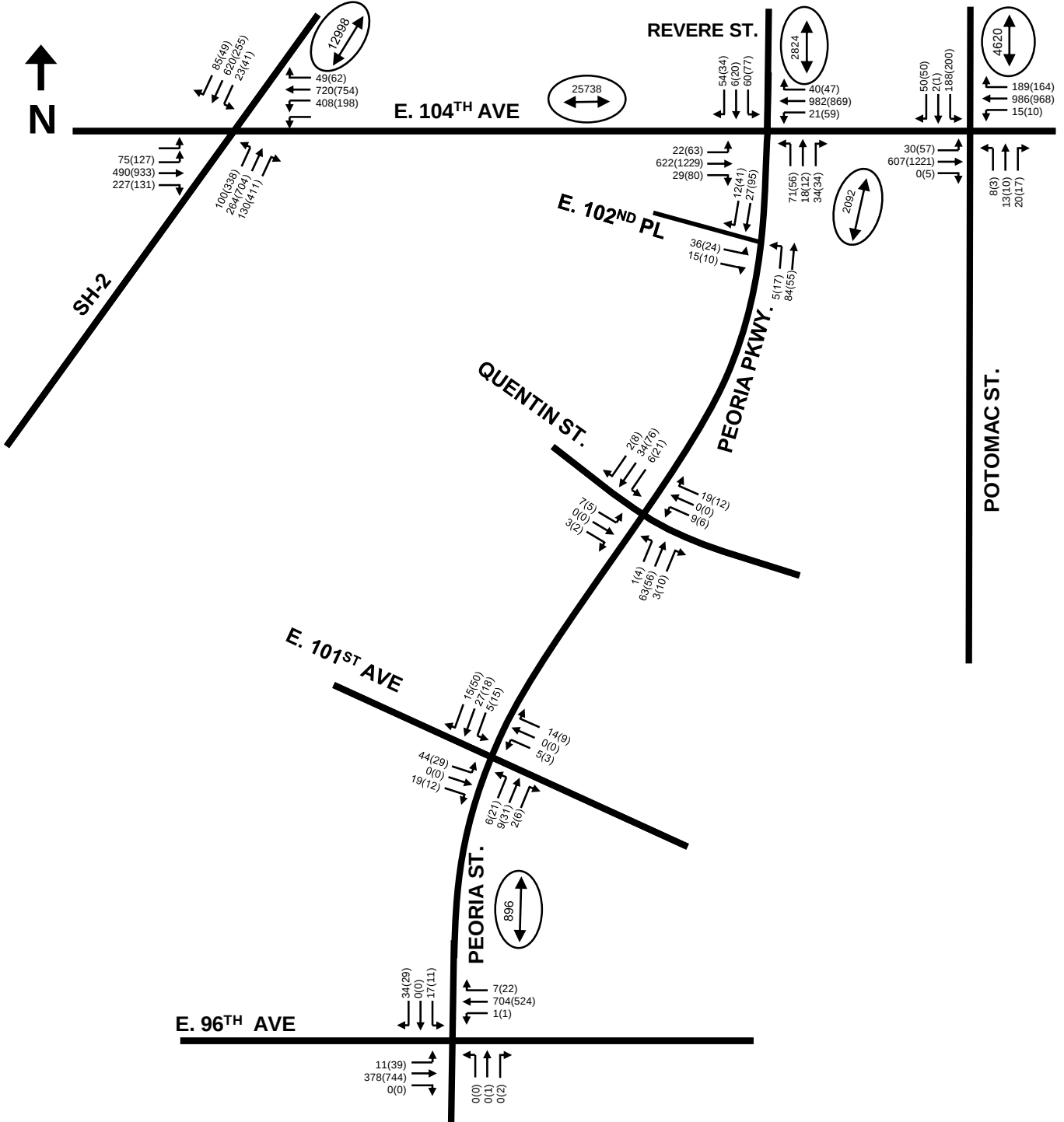




Legend: Drawing Not To Scale

← XX% Site-Generated Trip Distribution



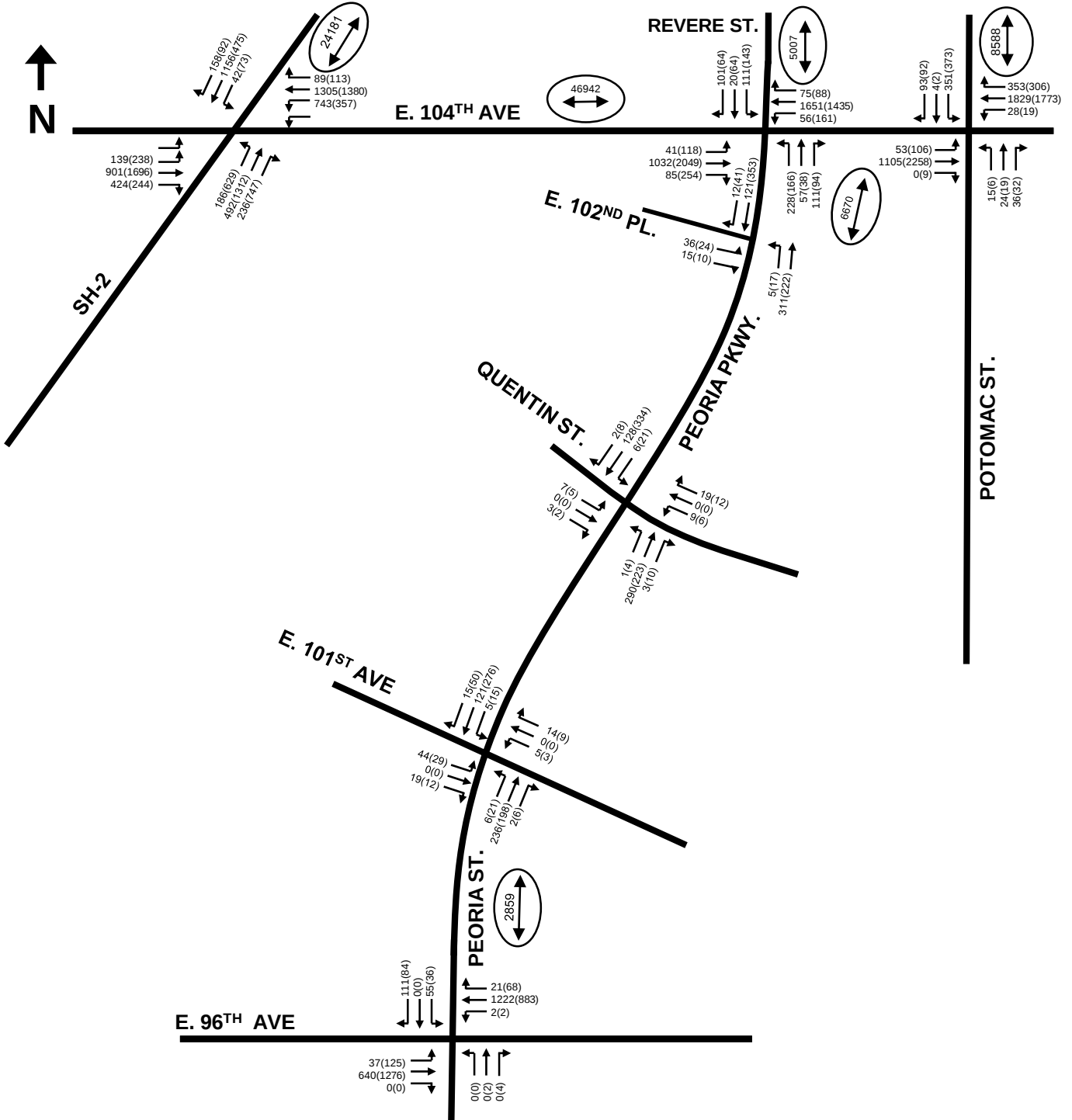


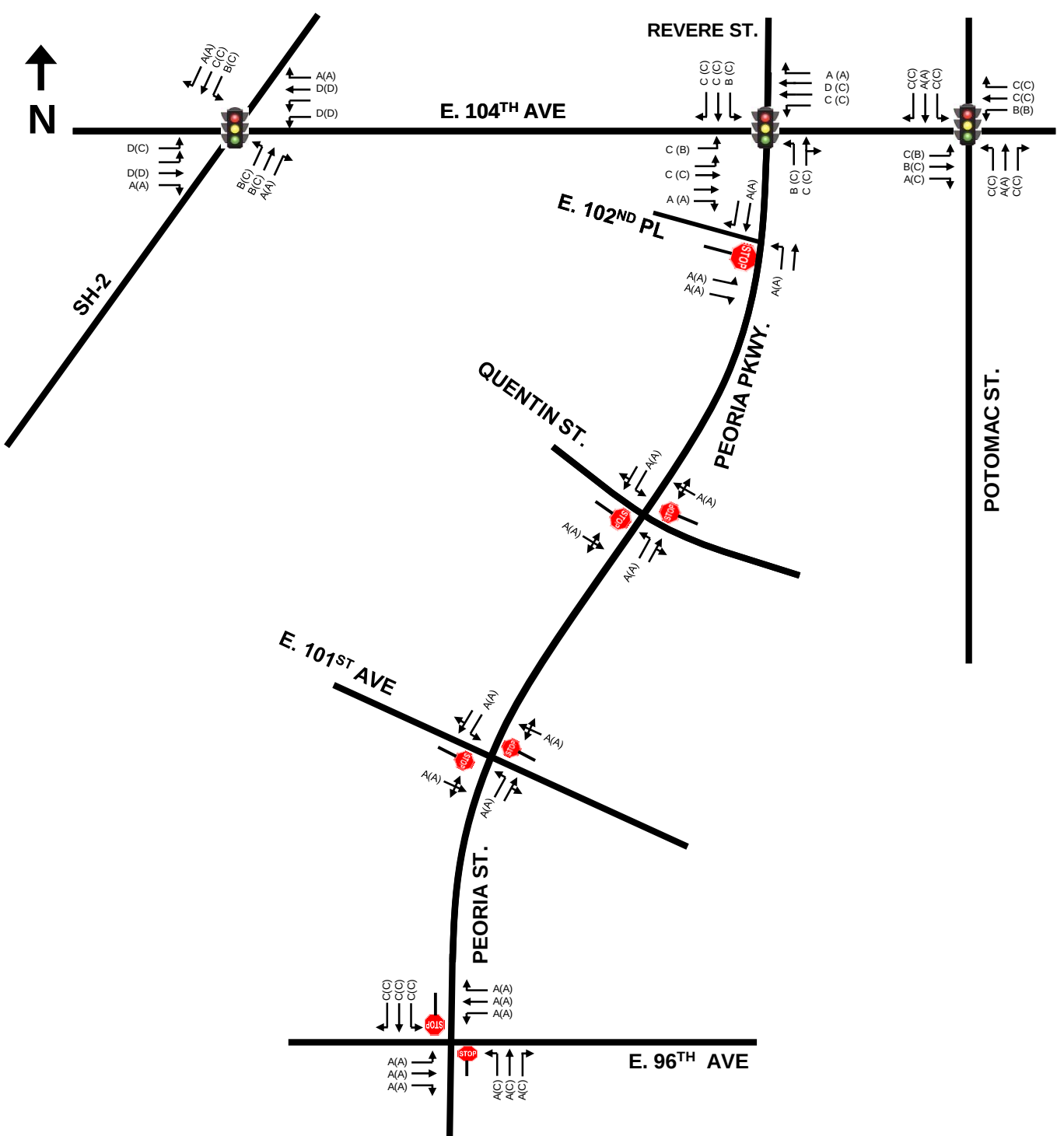
Legend:

24-Hour Directional
 Volume, vpd

5(8) Weekday AM (PM)
 64(50) Peak Hour
 8(7) Traffic Volumes, vph

Drawing Not To Scale



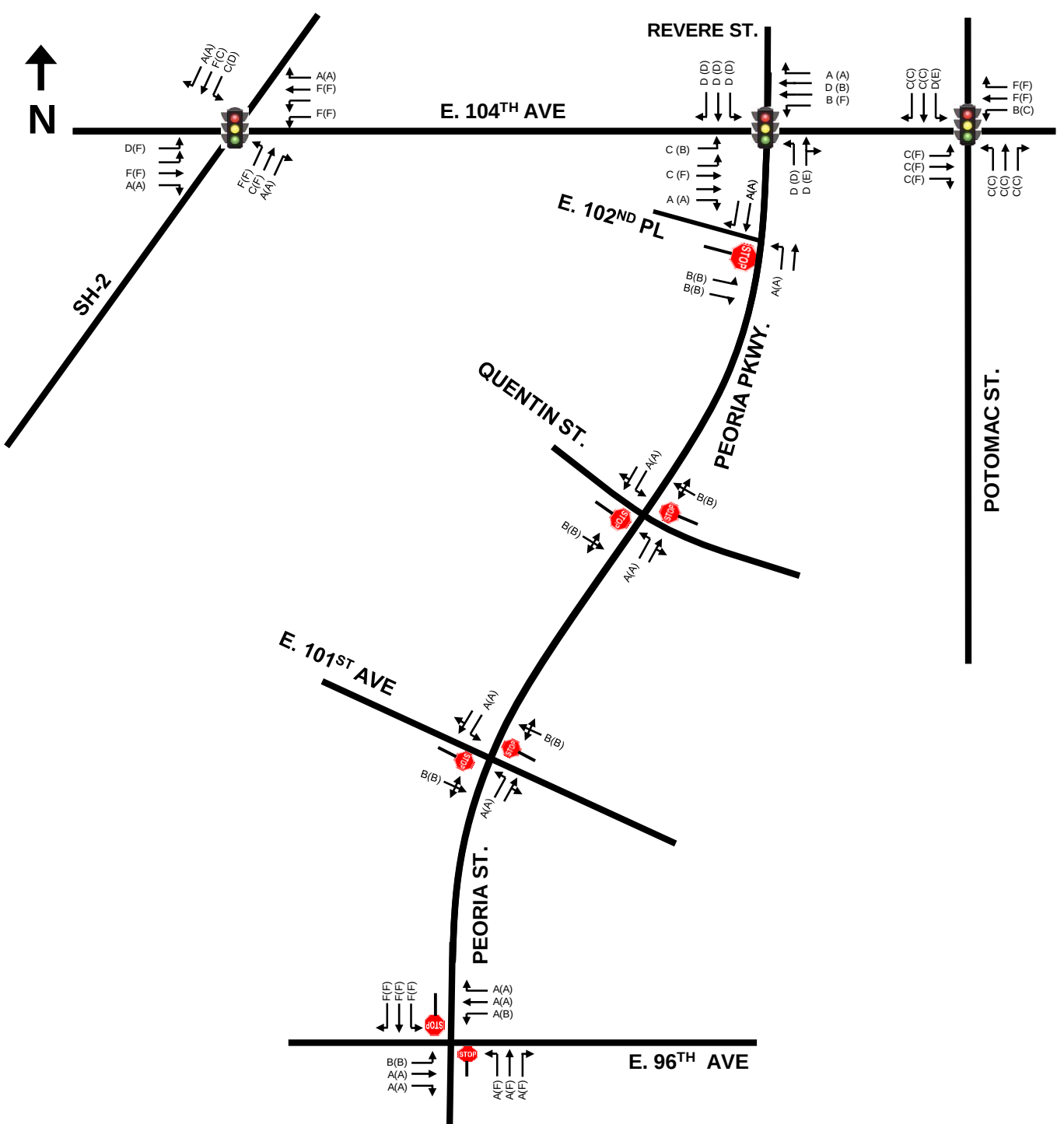


Legend:

- ↑ A (B)
- ← C (A)
- ↔ A (A)

Drawing Not To Scale

Weekday AM (PM)
Peak Hour Lane Group
Level of Service



Legend:

- ↑ A (B)
- ↑ C (A)
- ↑ A (A)

Drawing Not To Scale

Weekday AM (PM)
Peak Hour Lane Group
Level of Service

APPENDIX “A”

**2018 EXISTING
TRAFFIC VOLUME COUNTS**



(303) 216-2439
www.alltrafficdata.net

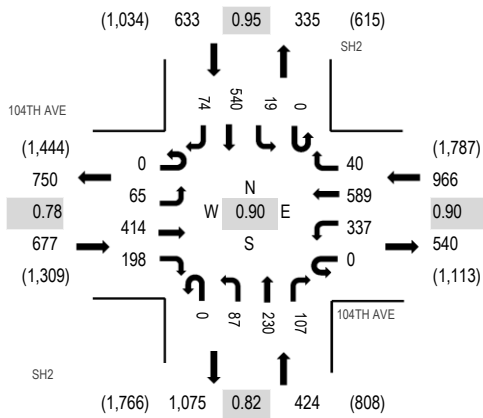
Location: 1 SH2 & 104TH AVE AM

Date and Start Time: Wednesday, October 3, 2018

Peak Hour: 07:00 AM - 08:00 AM

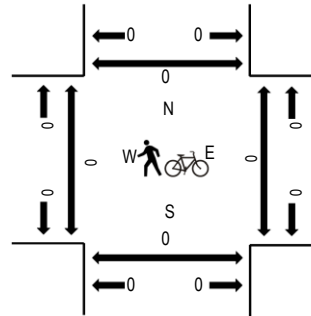
Peak 15-Minutes: 07:15 AM - 07:30 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

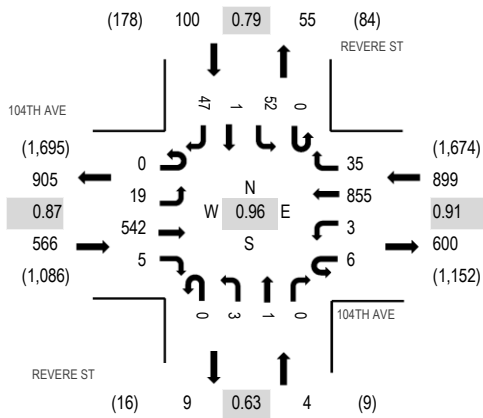
Interval Start Time	104TH AVE Eastbound				104TH AVE Westbound				SH2 Northbound				SH2 Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	8	78	51	0	88	144	6	0	32	51	25	0	7	146	11	647	2,700	0	0	0	0
7:15 AM	0	27	140	59	0	88	170	12	0	16	47	30	0	5	141	17	752	2,694	0	0	0	0
7:30 AM	0	18	101	45	0	67	118	11	0	19	79	31	0	6	136	24	655	2,588	0	0	0	0
7:45 AM	0	12	95	43	0	94	157	11	0	20	53	21	0	1	117	22	646	2,419	0	0	0	0
8:00 AM	0	9	113	41	0	71	153	18	1	32	47	24	0	7	102	23	641	2,238	0	0	0	0
8:15 AM	0	17	124	45	0	79	180	11	0	22	42	26	0	2	84	14	646		0	0	0	0
8:30 AM	0	9	101	24	0	45	96	6	0	16	56	29	0	6	85	13	486		0	0	0	0
8:45 AM	0	13	109	27	0	38	117	7	0	15	45	29	0	3	49	13	465		0	0	0	0
Count Total	0	113	861	335	0	570	1,135	82	1	172	420	215	0	37	860	137	4,938		0	0	0	0
Peak Hour	0	65	414	198	0	337	589	40	0	87	230	107	0	19	540	74	2,700		0	0	0	0



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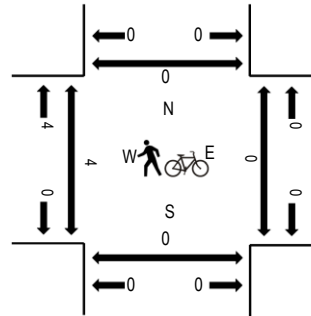
Location: 2 REVERE ST & 104TH AVE AM
Date and Start Time: Wednesday, October 3, 2018
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 08:00 AM - 08:15 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

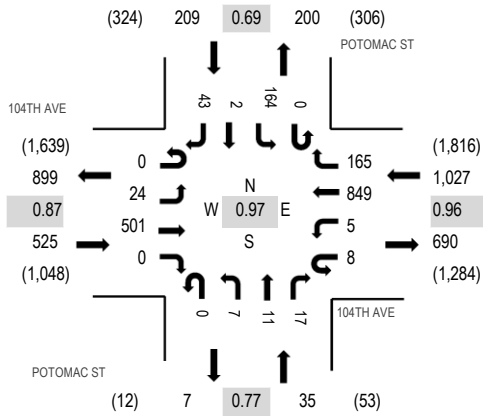
Interval Start Time	104TH AVE Eastbound				104TH AVE Westbound				REVERE ST Northbound				REVERE ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	3	105	2	2	1	247	2	0	1	0	1	0	15	0	19	398	1,557	3	0	0	0
7:15 AM	0	5	157	0	3	0	210	8	0	0	0	0	0	14	0	9	406	1,569	0	0	0	0
7:30 AM	0	3	148	2	1	1	180	15	0	1	1	0	0	10	1	11	374	1,555	2	0	0	0
7:45 AM	0	3	101	0	0	2	236	8	0	1	0	0	0	16	0	12	379	1,484	0	0	0	0
8:00 AM	0	8	136	3	2	0	229	4	0	1	0	0	0	12	0	15	410	1,390	0	0	0	0
8:15 AM	0	4	156	0	3	1	202	7	0	0	1	0	0	10	0	8	392		0	0	0	0
8:30 AM	0	1	125	2	2	0	153	5	0	0	0	2	0	5	0	8	303		0	0	1	0
8:45 AM	0	3	118	1	1	0	146	3	0	0	0	0	0	7	0	6	285		0	0	0	0
Count Total	0	30	1,046	10	14	5	1,603	52	0	4	2	3	0	89	1	88	2,947		5	0	1	0
Peak Hour	0	19	542	5	6	3	855	35	0	3	1	0	0	52	1	47	1,569		2	0	0	0



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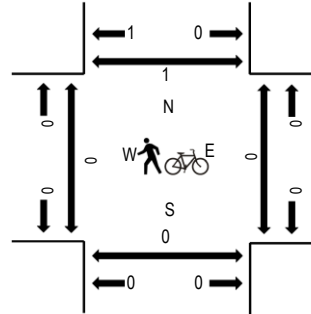
Location: 3 POTOMAC ST & 104TH AVE AM
Date and Start Time: Wednesday, October 3, 2018
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 08:00 AM - 08:15 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	104TH AVE Eastbound				104TH AVE Westbound				POTOMAC ST Northbound				POTOMAC ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	3	129	0	1	1	226	11	0	0	0	0	0	22	0	12	405	1,672	0	0	0	0
7:15 AM	0	3	137	0	1	0	189	23	0	0	2	4	0	15	1	10	385	1,729	0	0	0	0
7:30 AM	0	4	118	0	3	0	181	57	0	4	6	2	0	38	0	12	425	1,796	0	0	0	0
7:45 AM	0	6	101	0	2	1	236	24	0	1	2	8	0	63	0	13	457	1,717	0	0	0	0
8:00 AM	0	4	134	0	1	2	227	37	0	1	2	5	0	40	2	7	462	1,569	0	0	0	0
8:15 AM	0	10	148	0	2	2	205	47	0	1	1	2	0	23	0	11	452		0	0	0	1
8:30 AM	0	5	136	0	0	1	148	23	0	1	2	1	0	19	0	10	346		0	0	0	0
8:45 AM	0	6	104	0	0	2	136	27	0	0	1	7	0	18	0	8	309		0	0	0	0
Count Total	0	41	1,007	0	10	9	1,548	249	0	8	16	29	0	238	3	83	3,241		0	0	0	1
Peak Hour	0	24	501	0	8	5	849	165	0	7	11	17	0	164	2	43	1,796		0	0	0	1



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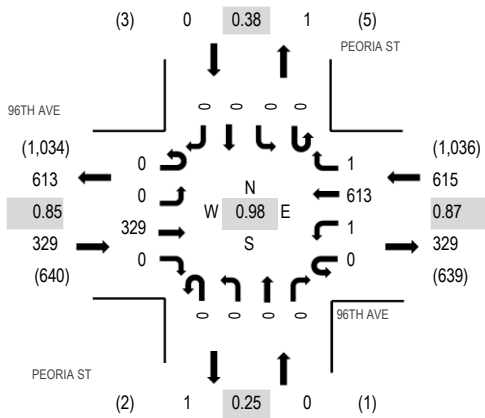
Location: 4 PEORIA ST & 96TH AVE AM

Date and Start Time: Wednesday, October 3, 2018

Peak Hour: 07:00 AM - 08:00 AM

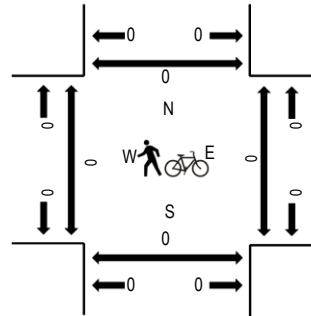
Peak 15-Minutes: 07:00 AM - 07:15 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	96TH AVE Eastbound				96TH AVE Westbound				PEORIA ST Northbound				PEORIA ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	65	0	0	0	0	177	0	0	0	0	0	0	0	0	242	944	0	0	0	0
7:15 AM	0	0	80	0	0	0	1	158	0	0	0	0	0	0	0	0	239	917	0	0	0	0
7:30 AM	0	0	104	0	0	0	0	124	1	0	0	0	0	0	0	0	229	855	0	0	0	0
7:45 AM	0	0	80	0	0	0	0	154	0	0	0	0	0	0	0	0	234	814	0	0	0	0
8:00 AM	0	1	87	0	0	0	0	125	0	0	0	1	0	0	0	0	215	736	0	0	0	0
8:15 AM	0	0	68	0	0	0	0	106	1	0	0	0	0	0	1	1	177		0	0	0	0
8:30 AM	0	0	77	0	0	0	0	110	1	0	0	0	0	0	0	0	188		0	0	0	0
8:45 AM	0	0	78	0	0	0	0	78	0	0	0	0	0	0	0	0	156		0	0	0	0
Count Total	0	1	639	0	0	0	1	1,032	3	0	0	1	0	0	0	1	2,160		0	0	0	0
Peak Hour	0	0	329	0	0	0	1	613	1	0	0	0	0	0	0	0	944		0	0	0	0



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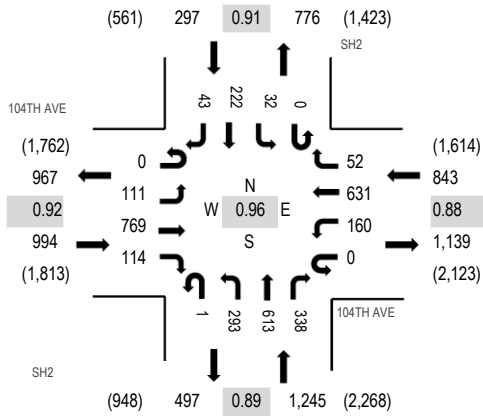
Location: 1 SH2 & 104TH AVE PM

Date and Start Time: Wednesday, October 3, 2018

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

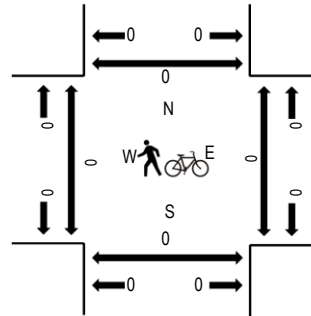
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

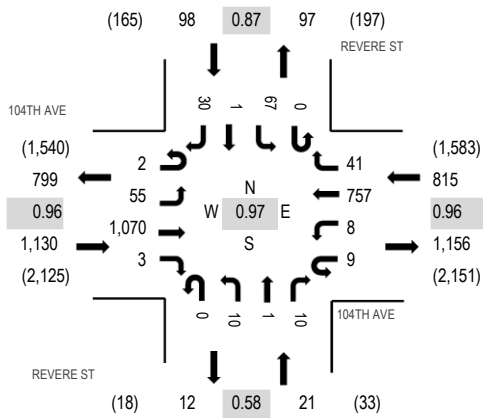
Interval Start Time	104TH AVE Eastbound				104TH AVE Westbound				SH2 Northbound				SH2 Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	28	148	25	0	38	134	18	0	43	107	82	0	7	48	5	683	3,066	0	0	0	0
4:15 PM	0	25	168	28	0	30	138	17	0	53	126	94	0	1	51	7	738	3,239	0	0	0	0
4:30 PM	0	32	163	30	0	38	137	13	1	85	152	83	0	5	50	12	801	3,379	0	0	0	0
4:45 PM	0	30	211	28	0	34	183	13	0	64	125	88	0	10	46	12	844	3,370	0	0	0	0
5:00 PM	0	25	182	30	0	40	127	14	0	77	180	94	0	11	65	11	856	3,190	0	0	0	0
5:15 PM	0	24	213	26	0	48	184	12	0	67	156	73	0	6	61	8	878		0	0	0	0
5:30 PM	0	18	169	29	0	33	160	14	0	59	135	90	0	6	69	10	792		0	0	0	0
5:45 PM	0	26	139	16	0	32	141	16	0	39	117	78	0	2	52	6	664		0	0	0	0
Count Total	0	208	1,393	212	0	293	1,204	117	1	487	1,098	682	0	48	442	71	6,256		0	0	0	0
Peak Hour	0	111	769	114	0	160	631	52	1	293	613	338	0	32	222	43	3,379		0	0	0	0



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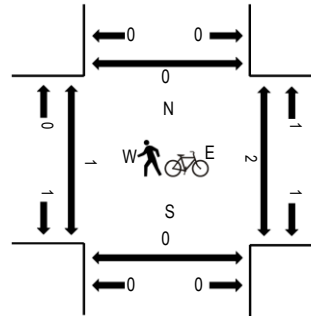
Location: 2 REVERE ST & 104TH AVE PM
Date and Start Time: Wednesday, October 3, 2018
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 05:30 PM - 05:45 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

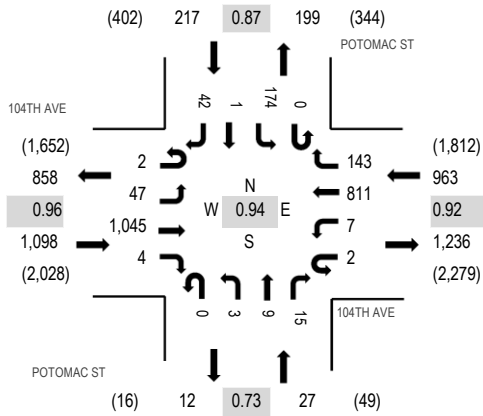
Interval Start Time	104TH AVE Eastbound				104TH AVE Westbound				REVERE ST Northbound				REVERE ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	1	12	217	0	1	0	191	7	0	1	0	1	0	8	0	3	442	1,911	0	0	0	0
4:15 PM	0	18	226	3	2	0	168	9	0	5	0	0	0	9	0	3	443	1,961	0	0	0	0
4:30 PM	0	14	260	1	5	0	193	4	0	1	0	1	0	13	0	4	496	2,029	0	0	0	0
4:45 PM	0	20	272	1	3	2	191	11	0	4	0	5	0	12	0	9	530	2,064	0	0	0	0
5:00 PM	1	16	259	0	2	2	172	6	0	1	1	2	0	21	1	8	492	1,995	1	2	0	0
5:15 PM	1	10	260	0	1	2	196	14	0	4	0	1	0	15	0	7	511		0	0	0	0
5:30 PM	0	9	279	2	3	2	198	10	0	1	0	2	0	19	0	6	531		0	0	0	0
5:45 PM	0	14	229	0	0	2	164	22	0	2	0	1	0	22	0	5	461		0	0	0	0
Count Total	3	113	2,002	7	17	10	1,473	83	0	19	1	13	0	119	1	45	3,906		1	2	0	0
Peak Hour	2	55	1,070	3	9	8	757	41	0	10	1	10	0	67	1	30	2,064		1	2	0	0



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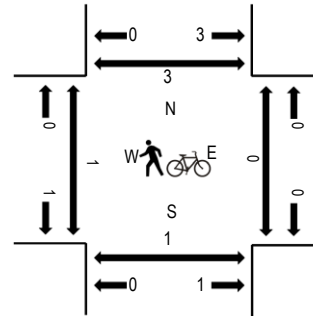
Location: 3 POTOMAC ST & 104TH AVE PM
Date and Start Time: Wednesday, October 3, 2018
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 05:30 PM - 05:45 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	104TH AVE Eastbound				104TH AVE Westbound				POTOMAC ST Northbound				POTOMAC ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	7	202	0	1	1	195	10	0	2	0	4	0	35	1	12	470	2,037	0	0	0	1
4:15 PM	0	16	212	0	1	1	169	24	0	1	0	7	0	35	0	6	472	2,092	0	0	0	0
4:30 PM	0	11	241	0	0	1	197	16	0	1	2	3	0	28	0	10	510	2,199	0	0	0	1
4:45 PM	1	13	262	1	0	3	212	33	0	1	1	5	0	43	0	10	585	2,305	0	0	0	0
5:00 PM	1	5	252	0	2	0	173	35	0	2	3	6	0	39	0	7	525	2,254	0	0	0	0
5:15 PM	0	11	264	1	0	4	208	32	0	0	3	2	0	40	0	14	579		0	0	0	0
5:30 PM	0	18	267	2	0	0	218	43	0	0	2	2	0	52	1	11	616		1	0	1	3
5:45 PM	0	8	233	0	0	0	182	51	0	1	0	1	0	40	0	18	534		0	0	0	1
Count Total	2	89	1,933	4	4	10	1,554	244	0	8	11	30	0	312	2	88	4,291		1	0	1	6
Peak Hour	2	47	1,045	4	2	7	811	143	0	3	9	15	0	174	1	42	2,305		1	0	1	3



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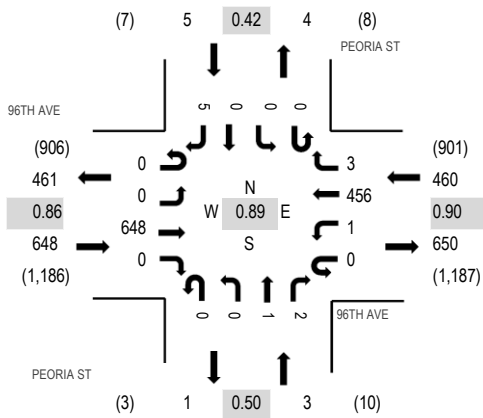
Location: 4 PEORIA ST & 96TH AVE PM

Date and Start Time: Wednesday, October 3, 2018

Peak Hour: 04:45 PM - 05:45 PM

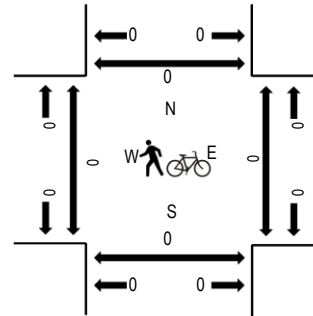
Peak 15-Minutes: 04:45 PM - 05:00 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	96TH AVE Eastbound				96TH AVE Westbound				PEORIA ST Northbound				PEORIA ST Southbound				Total	Rolling Hour	Pedestrian Crossings				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North	
4:00 PM	1	0	144	0	0	0	110	1	0	0	0	0	0	0	0	0	256	1,067	0	0	0	0	
4:15 PM	0	0	130	1	0	0	115	1	0	1	0	2	0	0	0	0	250	1,040	0	0	0	0	
4:30 PM	0	1	138	1	1	0	101	0	0	3	1	0	0	0	0	1	247	1,098	0	0	0	0	
4:45 PM	0	0	185	0	0	0	126	2	0	0	0	0	0	0	0	1	314	1,116	0	0	0	0	
5:00 PM	0	0	133	0	0	0	94	1	0	0	1	0	0	0	0	0	229	1,037	0	0	0	0	
5:15 PM	0	0	189	0	0	0	116	0	0	0	0	0	0	0	0	3	308		0	0	0	0	
5:30 PM	0	0	141	0	0	1	120	0	0	0	0	2	0	0	0	1	265		0	0	0	0	
5:45 PM	0	0	122	0	0	0	112	0	0	0	0	0	0	0	0	1	235		0	0	0	0	
Count Total	1	1	1,182	2	1	1	894	5	0	4	2	4	0	0	0	7	2,104		0	0	0	0	
Peak Hour	0	0	648	0	0	1	456	3	0	0	1	2	0	0	0	5	1,116		0	0	0	0	



Site Code: 5
Station ID:
SH2 N/O 104TH AVE

Start Time	03-Oct-18 Wed	NB	SB							Total
12:00 AM		27	29							56
01:00		30	18							48
02:00		35	27							62
03:00		33	58							91
04:00		42	102							144
05:00		126	260							386
06:00		230	652							882
07:00		380	678							1058
08:00		328	433							761
09:00		278	231							509
10:00		287	247							534
11:00		236	221							457
12:00 PM		292	207							499
01:00		329	226							555
02:00		366	192							558
03:00		538	266							804
04:00		711	296							1007
05:00		753	320							1073
06:00		439	230							669
07:00		247	182							429
08:00		147	113							260
09:00		122	81							203
10:00		85	57							142
11:00		40	39							79
Total		6101	5165							11266
Percent		54.2%	45.8%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	380	678	-	-	-	-	-	-	1058
PM Peak	-	17:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	753	320	-	-	-	-	-	-	1073
Total		6101	5165							11266
Percent		54.2%	45.8%							
ADT		ADT 11,266	AADT 11,266							



Site Code: 6
Station ID:
104TH AVE W/O REVERSE ST

Start Time	03-Oct-18 Wed	EB	WB							Total
12:00 AM		63	54							117
01:00		32	39							71
02:00		41	39							80
03:00		64	62							126
04:00		112	127							239
05:00		202	422							624
06:00		479	846							1325
07:00		575	980							1555
08:00		570	821							1391
09:00		400	554							954
10:00		408	510							918
11:00		479	548							1027
12:00 PM		556	614							1170
01:00		571	536							1107
02:00		554	602							1156
03:00		848	685							1533
04:00		1052	803							1855
05:00		1037	816							1853
06:00		779	650							1429
07:00		634	464							1098
08:00		458	293							751
09:00		291	183							474
10:00		190	136							326
11:00		90	102							192
Total		10485	10886							21371
Percent		49.1%	50.9%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	575	980	-	-	-	-	-	-	1555
PM Peak	-	16:00	17:00	-	-	-	-	-	-	16:00
Vol.	-	1052	816	-	-	-	-	-	-	1855
Total		10485	10886							21371
Percent		49.1%	50.9%							
ADT		ADT 21,371	AADT 21,371							



Site Code: 7
Station ID:
REVERE ST N/O 104TH AVE

Start Time	03-Oct-18 Wed	NB	SB							Total
12:00 AM		8	4							12
01:00		5	5							10
02:00		3	5							8
03:00		0	4							4
04:00		12	14							26
05:00		11	45							56
06:00		26	95							121
07:00		51	115							166
08:00		45	65							110
09:00		31	45							76
10:00		29	46							75
11:00		38	52							90
12:00 PM		50	58							108
01:00		56	60							116
02:00		60	60							120
03:00		95	64							159
04:00		108	62							170
05:00		106	105							211
06:00		95	92							187
07:00		78	67							145
08:00		44	49							93
09:00		44	27							71
10:00		27	16							43
11:00		15	7							22
Total		1037	1162							2199
Percent		47.2%	52.8%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	51	115	-	-	-	-	-	-	166
PM Peak	-	16:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	108	105	-	-	-	-	-	-	211
Total		1037	1162							2199
Percent		47.2%	52.8%							
ADT		ADT 2,199	AADT 2,199							



Site Code: 8
Station ID:
POTOMAC ST N/O 104TH AVE

Start Time	03-Oct-18 Wed	NB	SB							Total
12:00 AM		5	5							10
01:00		2	1							3
02:00		5	2							7
03:00		5	12							17
04:00		7	13							20
05:00		32	48							80
06:00		63	108							171
07:00		142	199							341
08:00		167	143							310
09:00		107	109							216
10:00		91	100							191
11:00		68	103							171
12:00 PM		96	126							222
01:00		98	97							195
02:00		101	95							196
03:00		160	180							340
04:00		137	178							315
05:00		212	216							428
06:00		129	158							287
07:00		87	150							237
08:00		53	68							121
09:00		36	37							73
10:00		15	13							28
11:00		12	6							18
Total		1830	2167							3997
Percent		45.8%	54.2%							
AM Peak	-	08:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	167	199	-	-	-	-	-	-	341
PM Peak	-	17:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	212	216	-	-	-	-	-	-	428
Total		1830	2167							3997
Percent		45.8%	54.2%							
ADT		ADT 3,997	AADT 3,997							

APPENDIX “B”

**INTERSECTION
CAPACITY ANALYSIS
WORKSHEETS**

Lanes and Geometrics
1: SH-2 & E 104th Ave

Turnberry
03/11/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 			 			 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%		0%				0%		0%			
Storage Length (ft)	500		880	450		300	700		500	800		500
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850				0.850		0.850		0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.266			0.223			0.346			0.597		
Satd. Flow (perm)	961	3539	1583	806	3539	1583	645	3539	1583	1112	3539	1583
Right Turn on Red			Yes				Yes		Yes		Yes	
Satd. Flow (RTOR)			215				209		209		209	
Link Speed (mph)	45				45				55		55	
Link Distance (ft)	1177				1609				1840		1644	
Travel Time (s)	17.8				24.4				22.8		20.4	

Intersection Summary

Area Type: Other

Timings
1: SH-2 & E 104th Ave

Turnberry
03/11/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	414	198	337	589	40	87	230	107	19	540	74
Future Volume (vph)	65	414	198	337	589	40	87	230	107	19	540	74
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	10.0	35.0		10.0	35.0		11.0	48.0		10.0	48.0	
Total Split (s)	10.0	37.0		17.0	44.0		11.0	56.0		10.0	55.0	
Total Split (%)	8.3%	30.8%		14.2%	36.7%		9.2%	46.7%		8.3%	45.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	26.1	21.1	120.0	38.1	30.1	120.0	71.1	66.2	120.0	64.8	57.6	120.0
Actuated g/C Ratio	0.22	0.18	1.00	0.32	0.25	1.00	0.59	0.55	1.00	0.54	0.48	1.00
v/c Ratio	0.23	0.72	0.14	0.71	0.72	0.03	0.21	0.13	0.07	0.03	0.35	0.05
Control Delay	29.5	53.2	0.2	38.6	46.3	0.0	12.4	15.1	0.1	11.7	21.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	53.2	0.2	38.6	46.3	0.0	12.4	15.1	0.1	11.7	21.2	0.1
LOS	C	D	A	D	D	A	B	B	A	B	C	A
Approach Delay		35.4			41.7			10.8			18.4	
Approach LOS		D			D			B			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 29.8

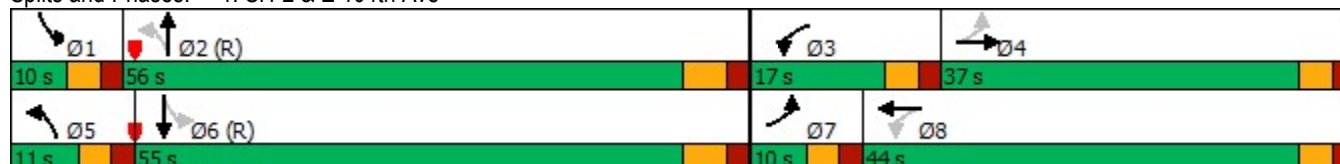
Intersection LOS: C

Intersection Capacity Utilization 58.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: SH-2 & E 104th Ave



HCM 2010 Signalized Intersection Summary

1: SH-2 & E 104th Ave

Turnberry
03/11/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	414	198	337	589	40	87	230	107	19	540	74
Future Volume (veh/h)	65	414	198	337	589	40	87	230	107	19	540	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	71	450	0	366	640	0	95	250	0	21	587	0
Adj No. of Lanes	2	2	1	2	2	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	324	561	251	530	782	350	488	1930	864	672	1863	834
Arrive On Green	0.04	0.16	0.00	0.10	0.22	0.00	0.04	0.55	0.00	0.02	0.53	0.00
Sat Flow, veh/h	3442	3539	1583	3442	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	71	450	0	366	640	0	95	250	0	21	587	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1721	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	2.0	14.7	0.0	10.3	20.6	0.0	2.9	4.1	0.0	0.7	11.3	0.0
Cycle Q Clear(g_c), s	2.0	14.7	0.0	10.3	20.6	0.0	2.9	4.1	0.0	0.7	11.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	324	561	251	530	782	350	488	1930	864	672	1863	834
V/C Ratio(X)	0.22	0.80	0.00	0.69	0.82	0.00	0.19	0.13	0.00	0.03	0.32	0.00
Avail Cap(c_a), veh/h	338	944	422	530	1150	515	506	1930	864	709	1863	834
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	40.3	48.7	0.0	36.7	44.5	0.0	12.5	13.3	0.0	12.4	16.1	0.0
Incr Delay (d2), s/veh	0.3	2.7	0.0	3.8	3.1	0.0	0.2	0.1	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.7	11.9	0.0	8.9	15.8	0.0	2.6	3.7	0.0	0.6	9.6	0.0
LnGrp Delay(d),s/veh	40.7	51.4	0.0	40.5	47.5	0.0	12.7	13.5	0.0	12.5	16.6	0.0
LnGrp LOS	D	D		D	D		B	B		B	B	
Approach Vol, veh/h		521			1006			345			608	
Approach Delay, s/veh		49.9			45.0			13.3			16.4	
Approach LOS		D			D			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.5	71.5	17.0	24.0	9.8	69.2	9.5	31.5				
Change Period (Y+Rc), s	5.0	6.0	5.0	5.0	5.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	5.0	50.0	12.0	32.0	6.0	49.0	5.0	39.0				
Max Q Clear Time (g_c+l1), s	2.7	6.1	12.3	16.7	4.9	13.3	4.0	22.6				
Green Ext Time (p_c), s	0.0	1.4	0.0	2.3	0.0	3.6	0.0	3.6				
Intersection Summary												
HCM 2010 Ctrl Delay				34.6								
HCM 2010 LOS				C								

Lanes and Geometrics
2: Revere St & E 104th Ave

Turnberry
03/11/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%		0%	
Storage Length (ft)	330		0	375		300	0		0	100		0
Storage Lanes	1		1	1		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850				0.850				0.850	
Flt Protected	0.950			0.950				0.964		0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	0	1796	0	1770	1863	1583
Flt Permitted	0.950			0.950				0.964		0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	0	1796	0	1770	1863	1583
Link Speed (mph)	45				45				30		30	
Link Distance (ft)	1609				3949				939		852	
Travel Time (s)	24.4				59.8				21.3		19.4	
Intersection Summary												
Area Type:	Other											

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	542	5	9	855	35	3	1	0	52	1	47
Future Vol, veh/h	19	542	5	9	855	35	3	1	0	52	1	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None	-	-	None
Storage Length	330	-	0	375	-	300	-	-	-	100	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	589	5	10	929	38	3	1	0	57	1	51

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	929	0	-	589	0	0	1116	1580	295	1286	1580	465
Stage 1	-	-	-	-	-	-	631	631	-	949	949	-
Stage 2	-	-	-	-	-	-	485	949	-	337	631	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	732	-	0	982	-	0	162	108	701	122	108	544
Stage 1	-	-	0	-	-	0	436	473	-	280	337	-
Stage 2	-	-	0	-	-	0	532	337	-	651	473	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	732	-	-	982	-	-	141	104	701	117	104	544
Mov Cap-2 Maneuver	-	-	-	-	-	-	141	104	-	117	104	-
Stage 1	-	-	-	-	-	-	423	459	-	272	334	-
Stage 2	-	-	-	-	-	-	476	334	-	631	459	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.1			33.9			38.2		
HCM LOS							D			E		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	129	732	-	982	-	117	104	544
HCM Lane V/C Ratio	0.034	0.028	-	0.01	-	0.483	0.01	0.094
HCM Control Delay (s)	33.9	10.1	-	8.7	-	61.6	40	12.3
HCM Lane LOS	D	B	-	A	-	F	E	B
HCM 95th %tile Q(veh)	0.1	0.1	-	0	-	2.2	0	0.3

Lanes and Geometrics
3: Potomac St & E 104th Ave

Turnberry
03/11/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%			0%		
Storage Length (ft)	575		0	450		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.976				0.910		0.856	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	0	1770	3454	0	1770	1695	0	1770	1595	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	0	1770	3454	0	1770	1695	0	1770	1595	0
Right Turn on Red	Yes				Yes				Yes		Yes	
Satd. Flow (RTOR)					23				18		47	
Link Speed (mph)	45				45				40		40	
Link Distance (ft)	3949				1321				1965		1374	
Travel Time (s)	59.8				20.0				33.5		23.4	

Intersection Summary

Area Type: Other

Timings 3: Potomac St & E 104th Ave

Turnberry

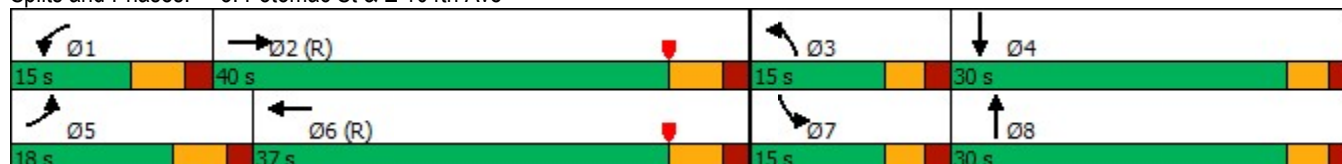
03/11/2020

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	24	501	13	849	7	11	164	2
Future Volume (vph)	24	501	13	849	7	11	164	2
Turn Type	Prot	NA	Prot	NA	Prot	NA	Prot	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases								
Detector Phase	5	2	1	6	3	8	7	4
Switch Phase								
Minimum Initial (s)	3.0	10.0	3.0	10.0	3.0	5.0	3.0	5.0
Minimum Split (s)	9.0	40.0	9.0	28.0	8.0	30.0	8.0	30.0
Total Split (s)	18.0	40.0	15.0	37.0	15.0	30.0	15.0	30.0
Total Split (%)	18.0%	40.0%	15.0%	37.0%	15.0%	30.0%	15.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	Max	None	Max
Act Effect Green (s)	7.0	46.2	6.4	43.2	6.1	25.0	10.0	37.6
Actuated g/C Ratio	0.07	0.46	0.06	0.43	0.06	0.25	0.10	0.38
v/c Ratio	0.21	0.33	0.12	0.73	0.07	0.07	1.01	0.08
Control Delay	47.2	18.7	46.1	28.3	45.4	17.2	115.9	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	18.7	46.1	28.3	45.4	17.2	115.9	8.2
LOS	D	B	D	C	D	B	F	A
Approach Delay		20.0		28.6		23.2		92.7
Approach LOS		C		C		C		F

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 67 (67%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.01
Intersection Signal Delay: 33.4
Intersection Capacity Utilization 53.7%
Analysis Period (min) 15
Intersection LOS: C
ICU Level of Service A

Splits and Phases: 3: Potomac St & E 104th Ave



HCM 2010 Signalized Intersection Summary

3: Potomac St & E 104th Ave

Turnberry
03/11/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	501	0	13	849	165	7	11	17	164	2	43
Future Volume (veh/h)	24	501	0	13	849	165	7	11	17	164	2	43
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	26	545	0	14	923	179	8	12	18	178	2	47
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	32	1488	0	17	1219	236	11	168	253	177	22	526
Arrive On Green	0.02	0.42	0.00	0.01	0.41	0.41	0.01	0.25	0.25	0.10	0.34	0.34
Sat Flow, veh/h	1774	3632	0	1774	2958	573	1774	674	1011	1774	65	1528
Grp Volume(v), veh/h	26	545	0	14	552	550	8	0	30	178	0	49
Grp Sat Flow(s),veh/h/ln	1774	1770	0	1774	1770	1762	1774	0	1684	1774	0	1593
Q Serve(g_s), s	1.5	10.6	0.0	0.8	26.7	26.7	0.5	0.0	1.4	10.0	0.0	2.1
Cycle Q Clear(g_c), s	1.5	10.6	0.0	0.8	26.7	26.7	0.5	0.0	1.4	10.0	0.0	2.1
Prop In Lane	1.00		0.00	1.00		0.33	1.00		0.60	1.00		0.96
Lane Grp Cap(c), veh/h	32	1488	0	17	729	726	11	0	421	177	0	548
V/C Ratio(X)	0.82	0.37	0.00	0.82	0.76	0.76	0.75	0.00	0.07	1.00	0.00	0.09
Avail Cap(c_a), veh/h	213	1488	0	160	729	726	177	0	421	177	0	548
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.9	19.9	0.0	49.4	25.1	25.1	49.6	0.0	28.6	45.0	0.0	22.2
Incr Delay (d2), s/veh	38.0	0.7	0.0	58.9	7.2	7.3	69.2	0.0	0.3	68.4	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.9	9.1	0.0	1.2	20.7	20.7	0.8	0.0	1.2	14.9	0.0	1.7
LnGrp Delay(d),s/veh	87.0	20.6	0.0	108.3	32.3	32.4	118.9	0.0	29.0	113.4	0.0	22.5
LnGrp LOS	F	C		F	C	C	F		C	F		C
Approach Vol, veh/h		571			1116			38			227	
Approach Delay, s/veh		23.6			33.3			47.9			93.8	
Approach LOS		C			C			D			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.0	48.0	5.6	39.4	7.8	47.2	15.0	30.0				
Change Period (Y+Rc), s	6.0	6.0	5.0	5.0	6.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	9.0	34.0	10.0	25.0	12.0	31.0	10.0	25.0				
Max Q Clear Time (g_c+l1), s	2.8	12.6	2.5	4.1	3.5	28.7	12.0	3.4				
Green Ext Time (p_c), s	0.0	3.3	0.0	0.2	0.0	1.4	0.0	0.1				
Intersection Summary												
HCM 2010 Ctrl Delay				37.8								
HCM 2010 LOS				D								

Lanes and Geometrics
4: Peoria St/Revere St & E 96th Ave

Turnberry
03/11/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%			0%		
Storage Length (ft)	150		250	220		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Flt												
Flt Protected				0.950								
Satd. Flow (prot)	1863	1863	1863	1770	1863	0	0	1863	0	0	1863	0
Flt Permitted				0.950								
Satd. Flow (perm)	1863	1863	1863	1770	1863	0	0	1863	0	0	1863	0
Link Speed (mph)	45			45			40			40		
Link Distance (ft)	1911			4445			904			2404		
Travel Time (s)	29.0			67.3			15.4			41.0		
Intersection Summary												
Area Type:	Other											

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	329	0	1	613	1	0	0	0	0	0	0
Future Vol, veh/h	0	329	0	1	613	1	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	358	0	1	666	1	0	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	667	0	0	358	0	0	1027	1027	358	1027	1027	667
Stage 1	-	-	-	-	-	-	358	358	-	669	669	-
Stage 2	-	-	-	-	-	-	669	669	-	358	358	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	923	-	-	1201	-	-	213	234	686	213	234	459
Stage 1	-	-	-	-	-	-	660	628	-	447	456	-
Stage 2	-	-	-	-	-	-	447	456	-	660	628	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	923	-	-	1201	-	-	213	234	686	213	234	459
Mov Cap-2 Maneuver	-	-	-	-	-	-	213	234	-	213	234	-
Stage 1	-	-	-	-	-	-	660	628	-	447	456	-
Stage 2	-	-	-	-	-	-	447	456	-	660	628	-

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

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	923	-	-	1201	-	-	-
HCM Lane V/C Ratio	-	-	-	-	0.001	-	-	-
HCM Control Delay (s)	0	0	-	-	8	-	-	0
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	-

Lanes and Geometrics
1: SH-2 & E 104th Ave

Turnberry
03/11/2020

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%		0%		0%		0%		0%		0%		
Storage Length (ft)	500		880	450		300	700		500	800		500	
Storage Lanes	2		1	2		1	1		1	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Ped Bike Factor													
Frt			0.850				0.850		0.850				0.850
Flt Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583	
Flt Permitted	0.213			0.115			0.543			0.399			
Satd. Flow (perm)	770	3539	1583	416	3539	1583	1011	3539	1583	743	3539	1583	
Right Turn on Red			Yes				Yes		Yes				Yes
Satd. Flow (RTOR)			209				209		367				209
Link Speed (mph)	45				45				55		55		
Link Distance (ft)	1177				1609				1840		1644		
Travel Time (s)	17.8				24.4				22.8		20.4		

Intersection Summary

Area Type: Other

Timings
1: SH-2 & E 104th Ave

Turnberry
03/11/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 			 		 	 	
Traffic Volume (vph)	111	769	114	160	631	52	294	613	338	32	222	43
Future Volume (vph)	111	769	114	160	631	52	294	613	338	32	222	43
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	10.0	35.0		10.0	35.0		11.0	48.0		10.0	48.0	
Total Split (s)	10.0	42.0		11.0	43.0		18.0	57.0		10.0	49.0	
Total Split (%)	8.3%	35.0%		9.2%	35.8%		15.0%	47.5%		8.3%	40.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	38.8	33.8	120.0	40.8	34.8	120.0	65.2	57.9	120.0	52.3	45.7	120.0
Actuated g/C Ratio	0.32	0.28	1.00	0.34	0.29	1.00	0.54	0.48	1.00	0.44	0.38	1.00
v/c Ratio	0.34	0.84	0.08	0.60	0.67	0.04	0.50	0.39	0.23	0.09	0.18	0.03
Control Delay	26.4	48.9	0.1	33.1	40.8	0.0	19.3	22.0	0.3	15.3	26.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.4	48.9	0.1	33.1	40.8	0.0	19.3	22.0	0.3	15.3	26.0	0.0
LOS	C	D	A	C	D	A	B	C	A	B	C	A
Approach Delay		40.8			36.8			15.5			21.0	
Approach LOS		D			D			B			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 28.7

Intersection LOS: C

Intersection Capacity Utilization 66.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: SH-2 & E 104th Ave



HCM 2010 Signalized Intersection Summary

1: SH-2 & E 104th Ave

Turnberry
03/11/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	769	114	160	631	52	294	613	338	32	222	43
Future Volume (veh/h)	111	769	114	160	631	52	294	613	338	32	222	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	121	836	0	174	686	0	320	666	0	35	241	0
Adj No. of Lanes	2	2	1	2	2	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	414	953	426	347	984	440	653	1689	755	384	1407	629
Arrive On Green	0.04	0.27	0.00	0.05	0.28	0.00	0.11	0.48	0.00	0.03	0.40	0.00
Sat Flow, veh/h	3442	3539	1583	3442	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	121	836	0	174	686	0	320	666	0	35	241	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1721	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	3.0	27.1	0.0	4.4	20.8	0.0	12.6	14.5	0.0	1.4	5.3	0.0
Cycle Q Clear(g_c), s	3.0	27.1	0.0	4.4	20.8	0.0	12.6	14.5	0.0	1.4	5.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	414	953	426	347	984	440	653	1689	755	384	1407	629
V/C Ratio(X)	0.29	0.88	0.00	0.50	0.70	0.00	0.49	0.39	0.00	0.09	0.17	0.00
Avail Cap(c_a), veh/h	416	1091	488	347	1121	501	653	1689	755	407	1407	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.4	42.0	0.0	32.8	38.8	0.0	17.0	20.2	0.0	20.3	23.4	0.0
Incr Delay (d2), s/veh	0.4	7.5	0.0	1.1	1.6	0.0	0.6	0.7	0.0	0.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	20.4	0.0	3.8	15.7	0.0	10.3	11.7	0.0	1.2	4.7	0.0
LnGrp Delay(d),s/veh	31.7	49.5	0.0	34.0	40.4	0.0	17.6	20.9	0.0	20.4	23.6	0.0
LnGrp LOS	C	D		C	D		B	C		C	C	
Approach Vol, veh/h		957			860			986			276	
Approach Delay, s/veh		47.2			39.1			19.8			23.2	
Approach LOS		D			D			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.4	63.3	11.0	37.3	18.0	53.7	9.9	38.4				
Change Period (Y+Rc), s	5.0	6.0	5.0	5.0	5.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	5.0	51.0	6.0	37.0	13.0	43.0	5.0	38.0				
Max Q Clear Time (g_c+I1), s	3.4	16.5	6.4	29.1	14.6	7.3	5.0	22.8				
Green Ext Time (p_c), s	0.0	4.2	0.0	3.2	0.0	1.3	0.0	3.7				
Intersection Summary												
HCM 2010 Ctrl Delay			34.0									
HCM 2010 LOS			C									

Lanes and Geometrics
2: Revere St & E 104th Ave

Turnberry
03/11/2020

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 			 			 		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%		0%				0%		0%				
Storage Length (ft)	330		0	375		300	0		0	100		0	
Storage Lanes	1		1	1		1	0		0	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt			0.850				0.850		0.935				0.850
Flt Protected	0.950			0.950				0.977		0.950			
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	0	1702	0	1770	1863	1583	
Flt Permitted	0.950			0.950				0.977		0.950			
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	0	1702	0	1770	1863	1583	
Link Speed (mph)	45						45		30		30		
Link Distance (ft)	1609						3949		939		852		
Travel Time (s)	24.4						59.8		21.3		19.4		
Intersection Summary													
Area Type:	Other												

Intersection												
Int Delay, s/veh	9.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	55	1070	3	17	757	41	10	1	10	67	1	30
Future Vol, veh/h	55	1070	3	17	757	41	10	1	10	67	1	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	Free	-	-	None	-	-	None
Storage Length	330	-	0	375	-	300	-	-	-	100	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	60	1163	3	18	823	45	11	1	11	73	1	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	823	0	-	1163	0	0	1731	2142	582	1561	2142	412
Stage 1	-	-	-	-	-	-	1283	1283	-	859	859	-
Stage 2	-	-	-	-	-	-	448	859	-	702	1283	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	803	-	0	596	-	0	57	48	456	76	48	589
Stage 1	-	-	0	-	-	0	175	234	-	317	371	-
Stage 2	-	-	0	-	-	0	560	371	-	395	234	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	803	-	-	596	-	-	49	43	456	~ 67	43	589
Mov Cap-2 Maneuver	-	-	-	-	-	-	49	43	-	~ 67	43	-
Stage 1	-	-	-	-	-	-	162	216	-	293	360	-
Stage 2	-	-	-	-	-	-	511	360	-	355	216	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.2	63.1	169.6
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	84	803	-	596	-	67	43	589
HCM Lane V/C Ratio	0.272	0.074	-	0.031	-	1.087	0.025	0.055
HCM Control Delay (s)	63.1	9.8	-	11.2	-	241.6	90.9	11.5
HCM Lane LOS	F	A	-	B	-	F	F	B
HCM 95th %tile Q(veh)	1	0.2	-	0.1	-	5.6	0.1	0.2

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes and Geometrics
3: Potomac St & E 104th Ave

Turnberry
03/11/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%			0%		
Storage Length (ft)	575		0	450		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.999			0.978			0.908			0.853		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3536	0	1770	3461	0	1770	1691	0	1770	1589	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3536	0	1770	3461	0	1770	1691	0	1770	1589	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				21			16			46		
Link Speed (mph)	45			45			40			40		
Link Distance (ft)	3949			1321			1965			1374		
Travel Time (s)	59.8			20.0			33.5			23.4		

Intersection Summary

Area Type: Other

Timings 3: Potomac St & E 104th Ave

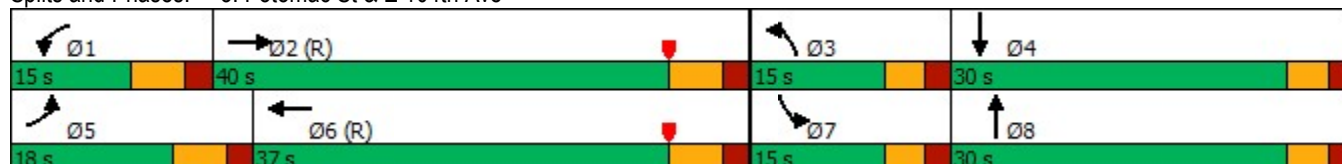
Turnberry
03/11/2020

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	49	1045	9	811	3	9	174	1
Future Volume (vph)	49	1045	9	811	3	9	174	1
Turn Type	Prot	NA	Prot	NA	Prot	NA	Prot	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases								
Detector Phase	5	2	1	6	3	8	7	4
Switch Phase								
Minimum Initial (s)	3.0	10.0	3.0	10.0	3.0	5.0	3.0	5.0
Minimum Split (s)	9.0	40.0	9.0	28.0	8.0	30.0	8.0	30.0
Total Split (s)	18.0	40.0	15.0	37.0	15.0	30.0	15.0	30.0
Total Split (%)	18.0%	40.0%	15.0%	37.0%	15.0%	30.0%	15.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	Max	None	Max
Act Effect Green (s)	8.4	46.3	6.2	36.9	5.8	25.0	10.0	37.7
Actuated g/C Ratio	0.08	0.46	0.06	0.37	0.06	0.25	0.10	0.38
v/c Ratio	0.36	0.70	0.09	0.80	0.03	0.06	1.07	0.07
Control Delay	49.2	25.3	45.7	35.0	45.0	17.4	131.4	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	25.3	45.7	35.0	45.0	17.4	131.4	8.0
LOS	D	C	D	D	D	B	F	A
Approach Delay		26.3		35.1		20.2		106.8
Approach LOS		C		D		C		F

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 67 (67%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 37.5
Intersection Capacity Utilization 62.8%
Analysis Period (min) 15
Intersection LOS: D
ICU Level of Service B

Splits and Phases: 3: Potomac St & E 104th Ave



HCM 2010 Signalized Intersection Summary

3: Potomac St & E 104th Ave

Turnberry
03/11/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	1045	4	9	811	143	3	9	15	174	1	42
Future Volume (veh/h)	49	1045	4	9	811	143	3	9	15	174	1	42
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	53	1136	4	10	882	155	3	10	16	189	1	46
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	68	1529	5	13	1178	207	4	162	259	177	12	540
Arrive On Green	0.04	0.42	0.42	0.01	0.39	0.39	0.00	0.25	0.25	0.10	0.35	0.35
Sat Flow, veh/h	1774	3617	13	1774	3010	529	1774	646	1034	1774	34	1555
Grp Volume(v), veh/h	53	556	584	10	518	519	3	0	26	189	0	47
Grp Sat Flow(s),veh/h/ln	1774	1770	1860	1774	1770	1769	1774	0	1680	1774	0	1588
Q Serve(g_s), s	3.0	26.4	26.4	0.6	25.2	25.2	0.2	0.0	1.2	10.0	0.0	2.0
Cycle Q Clear(g_c), s	3.0	26.4	26.4	0.6	25.2	25.2	0.2	0.0	1.2	10.0	0.0	2.0
Prop In Lane	1.00		0.01	1.00		0.30	1.00		0.62	1.00		0.98
Lane Grp Cap(c), veh/h	68	748	786	13	693	693	4	0	420	177	0	552
V/C Ratio(X)	0.78	0.74	0.74	0.77	0.75	0.75	0.70	0.00	0.06	1.07	0.00	0.09
Avail Cap(c_a), veh/h	213	748	786	160	693	693	177	0	420	177	0	552
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.6	24.3	24.3	49.6	26.2	26.2	49.8	0.0	28.6	45.0	0.0	21.9
Incr Delay (d2), s/veh	16.8	6.6	6.3	63.6	7.3	7.3	116.4	0.0	0.3	86.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.2	20.4	21.2	0.9	19.7	19.7	0.4	0.0	1.0	16.4	0.0	1.7
LnGrp Delay(d),s/veh	64.5	30.9	30.6	113.2	33.5	33.5	166.2	0.0	28.8	131.0	0.0	22.2
LnGrp LOS	E	C	C	F	C	C	F		C	F		C
Approach Vol, veh/h	1193			1047				29		236		
Approach Delay, s/veh	32.2			34.2				43.1		109.3		
Approach LOS	C			C				D		F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.7	48.3	5.2	39.8	9.9	45.1	15.0	30.0				
Change Period (Y+Rc), s	6.0	6.0	5.0	5.0	6.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	9.0	34.0	10.0	25.0	12.0	31.0	10.0	25.0				
Max Q Clear Time (g_c+I1), s	2.6	28.4	2.2	4.0	5.0	27.2	12.0	3.2				
Green Ext Time (p_c), s	0.0	3.1	0.0	0.2	0.0	2.1	0.0	0.1				
Intersection Summary												
HCM 2010 Ctrl Delay	40.4											
HCM 2010 LOS	D											

Lanes and Geometrics
4: Peoria St/Revere St & E 96th Ave

Turnberry
03/11/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%			
Storage Length (ft)	150			250	220			0	0			0
Storage Lanes	1			1	1			0	0			0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt					0.999		0.910			0.865		
Flt Protected					0.950							
Satd. Flow (prot)	1863	1863	1863	1770	1861	0	0	1695	0	0	1611	0
Flt Permitted					0.950							
Satd. Flow (perm)	1863	1863	1863	1770	1861	0	0	1695	0	0	1611	0
Link Speed (mph)	45				45		40			40		
Link Distance (ft)	1911				4445		904			2404		
Travel Time (s)	29.0				67.3		15.4			41.0		

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	648	0	1	456	3	0	1	2	0	0	5
Future Vol, veh/h	0	648	0	1	456	3	0	1	2	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	704	0	1	496	3	0	1	2	0	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	499	0	0	704	0	0	1206	1205	704	1206	1204	498
Stage 1	-	-	-	-	-	-	704	704	-	500	500	-
Stage 2	-	-	-	-	-	-	502	501	-	706	704	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1065	-	-	894	-	-	160	184	437	160	184	572
Stage 1	-	-	-	-	-	-	428	440	-	553	543	-
Stage 2	-	-	-	-	-	-	552	543	-	427	440	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1065	-	-	894	-	-	158	184	437	158	184	572
Mov Cap-2 Maneuver	-	-	-	-	-	-	158	184	-	158	184	-
Stage 1	-	-	-	-	-	-	428	440	-	553	542	-
Stage 2	-	-	-	-	-	-	546	542	-	424	440	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			17.1			11.4		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	300	1065	-	-	894	-	-	572
HCM Lane V/C Ratio	0.011	-	-	-	0.001	-	-	0.01
HCM Control Delay (s)	17.1	0	-	-	9	-	-	11.4
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Lanes and Geometrics
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%		0%		0%		0%		0%		0%		
Storage Length (ft)	500		880	450		300	700		500	800		500	
Storage Lanes	2		1	2		1	1		1	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Ped Bike Factor													
Frt			0.850			0.850			0.850			0.850	
Flt Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583	
Flt Permitted	0.253			0.191			0.290			0.576			
Satd. Flow (perm)	914	3539	1583	690	3539	1583	540	3539	1583	1073	3539	1583	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			247			209			209			209	
Link Speed (mph)	45				45			55			55		
Link Distance (ft)	1177				1609			1840			1644		
Travel Time (s)	17.8				24.4			22.8			20.4		

Intersection Summary

Area Type: Other

Timings
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	475	227	387	676	46	100	264	123	22	620	85
Future Volume (vph)	75	475	227	387	676	46	100	264	123	22	620	85
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	10.0	35.0		10.0	35.0		11.0	48.0		10.0	48.0	
Total Split (s)	10.0	36.0		20.0	46.0		11.0	54.0		10.0	53.0	
Total Split (%)	8.3%	30.0%		16.7%	38.3%		9.2%	45.0%		8.3%	44.2%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	28.0	23.0	120.0	42.7	34.7	120.0	65.8	59.3	120.0	60.3	53.0	120.0
Actuated g/C Ratio	0.23	0.19	1.00	0.36	0.29	1.00	0.55	0.49	1.00	0.50	0.44	1.00
v/c Ratio	0.26	0.76	0.16	0.73	0.72	0.03	0.29	0.16	0.08	0.04	0.43	0.06
Control Delay	27.2	53.2	0.2	36.1	15.5	0.0	15.5	19.1	0.1	13.8	25.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	53.2	0.2	36.1	15.5	0.0	15.5	19.1	0.1	13.8	25.2	0.1
LOS	C	D	A	D	B	A	B	B	A	B	C	A
Approach Delay		35.2			22.0			13.5			21.9	
Approach LOS		D			C			B			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 24.0

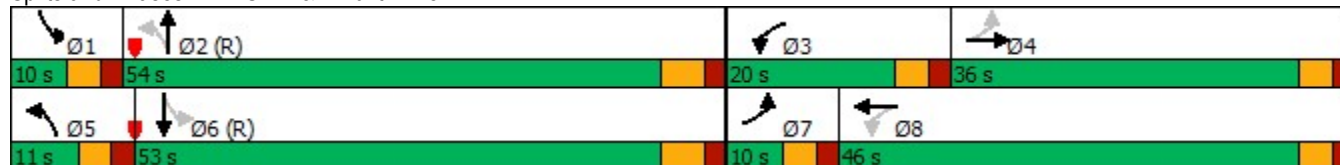
Intersection LOS: C

Intersection Capacity Utilization 64.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: SH-2 & E 104th Ave



HCM 6th Signalized Intersection Summary

1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	475	227	387	676	46	100	264	123	22	620	85
Future Volume (veh/h)	75	475	227	387	676	46	100	264	123	22	620	85
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	82	516	0	421	735	0	109	287	0	24	674	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	366	628		583	900		422	1811		611	1730	
Arrive On Green	0.04	0.18	0.00	0.23	0.51	0.00	0.05	0.51	0.00	0.02	0.49	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	82	516	0	421	735	0	109	287	0	24	674	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	2.3	16.8	0.0	11.6	20.9	0.0	3.7	5.2	0.0	0.8	14.4	0.0
Cycle Q Clear(g_c), s	2.3	16.8	0.0	11.6	20.9	0.0	3.7	5.2	0.0	0.8	14.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	366	628		583	900		422	1811		611	1730	
V/C Ratio(X)	0.22	0.82		0.72	0.82		0.26	0.16		0.04	0.39	
Avail Cap(c_a), veh/h	375	918		616	1214		429	1811		644	1730	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.61	0.61	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.4	47.6	0.0	30.0	27.2	0.0	15.0	15.7	0.0	14.6	19.5	0.0
Incr Delay (d2), s/veh	0.3	3.9	0.0	2.4	2.0	0.0	0.3	0.2	0.0	0.0	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.7	12.1	0.0	6.8	9.4	0.0	2.5	3.6	0.0	0.5	9.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.7	51.5	0.0	32.4	29.3	0.0	15.3	15.9	0.0	14.7	20.2	0.0
LnGrp LOS	D	D		C	C		B	B		B	C	
Approach Vol, veh/h	598		A	1156		A	396		A	698		A
Approach Delay, s/veh	49.7			30.4			15.7			20.0		
Approach LOS	D			C			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.8	67.2	18.9	26.2	10.5	64.4	9.7	35.4				
Change Period (Y+Rc), s	5.0	6.0	5.0	5.0	5.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	5.0	48.0	15.0	31.0	6.0	47.0	5.0	41.0				
Max Q Clear Time (g_c+I1), s	2.8	7.2	13.6	18.8	5.7	16.4	4.3	22.9				
Green Ext Time (p_c), s	0.0	1.6	0.2	2.4	0.0	4.2	0.0	4.4				

Intersection Summary

HCM 6th Ctrl Delay	29.9
HCM 6th LOS	C

Notes

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

Lanes and Geometrics
2: Revere St & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 			 			 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%		0%	
Storage Length (ft)	330		0	375		300	200		0	100		0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.850			0.850						0.850		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	1863	0	1770	1863	1583
Flt Permitted	0.109			0.318			0.757			0.685		
Satd. Flow (perm)	394	3539	1583	592	3539	1583	1410	1863	0	1276	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			136						95
Link Speed (mph)	45				45		30				30	
Link Distance (ft)	1609				3949		939				852	
Travel Time (s)	24.4				59.8		21.3				19.4	

Intersection Summary

Area Type: Other

Timings 2: Revere St & E 104th Ave

Turnberry
07/13/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	22	622	6	10	982	40	3	1	60	1	54
Future Volume (vph)	22	622	6	10	982	40	3	1	60	1	54
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		Free	8		Free	2		6		6
Detector Phase	7	4		3	8		5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		2.0	5.0		2.0	2.0	2.0	3.0	3.0
Minimum Split (s)	9.5	22.5		6.5	22.5		9.5	23.0	6.5	22.5	22.5
Total Split (s)	11.0	71.0		9.0	69.0		11.0	26.0	14.0	29.0	29.0
Total Split (%)	9.2%	59.2%		7.5%	57.5%		9.2%	21.7%	11.7%	24.2%	24.2%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max	None	C-Max	C-Max
Act Effect Green (s)	53.0	51.7	120.0	49.7	47.0	120.0	51.5	46.9	57.5	55.4	55.4
Actuated g/C Ratio	0.44	0.43	1.00	0.41	0.39	1.00	0.43	0.39	0.48	0.46	0.46
v/c Ratio	0.07	0.44	0.00	0.04	0.77	0.03	0.00	0.00	0.10	0.00	0.08
Control Delay	33.0	46.1	0.0	14.0	35.5	0.0	23.0	33.0	21.5	27.0	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	46.1	0.0	14.0	35.5	0.0	23.0	33.0	21.5	27.0	2.1
LOS	C	D	A	B	D	A	C	C	C	C	A
Approach Delay		45.2			33.9			25.5		12.4	
Approach LOS		D			C			C		B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 36.6

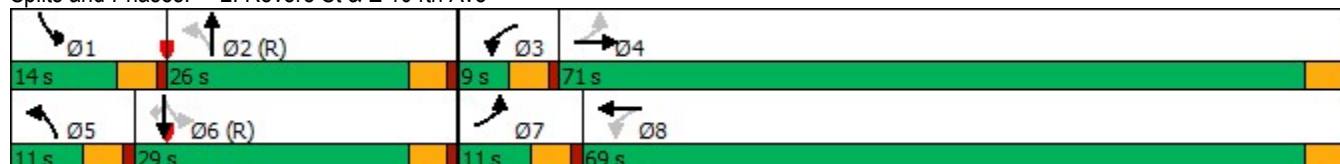
Intersection LOS: D

Intersection Capacity Utilization 45.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Revere St & E 104th Ave



HCM 6th Signalized Intersection Summary

2: Revere St & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	622	6	10	982	40	3	1	0	60	1	54
Future Volume (veh/h)	22	622	6	10	982	40	3	1	0	60	1	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	676	0	11	1067	0	3	1	0	65	1	59
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	1335		233	1276		648	814	0	734	872	739
Arrive On Green	0.02	0.25	0.00	0.01	0.36	0.00	0.00	0.44	0.00	0.03	0.47	0.47
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	1781	1870	0	1781	1870	1585
Grp Volume(v), veh/h	24	676	0	11	1067	0	3	1	0	65	1	59
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1781	1870	0	1781	1870	1585
Q Serve(g_s), s	0.5	19.6	0.0	0.5	33.0	0.0	0.1	0.0	0.0	2.4	0.0	2.5
Cycle Q Clear(g_c), s	0.5	19.6	0.0	0.5	33.0	0.0	0.1	0.0	0.0	2.4	0.0	2.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	286	1335		233	1276		648	814	0	734	872	739
V/C Ratio(X)	0.08	0.51		0.05	0.84		0.00	0.00	0.00	0.09	0.00	0.08
Avail Cap(c_a), veh/h	393	1969		289	1910		741	814	0	817	872	739
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.77	0.77	0.00	0.92	0.92	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.9	35.4	0.0	25.6	35.2	0.0	19.0	19.1	0.0	17.0	17.1	17.8
Incr Delay (d2), s/veh	0.1	0.2	0.0	0.1	2.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	13.1	0.0	0.4	19.8	0.0	0.1	0.0	0.0	1.8	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	35.6	0.0	25.7	37.2	0.0	19.0	19.1	0.0	17.0	17.1	18.0
LnGrp LOS	C	D		C	D		B	B	A	B	B	B
Approach Vol, veh/h		700	A		1078	A		4			125	
Approach Delay, s/veh		35.3			37.1			19.1			17.5	
Approach LOS		D			D			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.4	56.7	5.3	49.6	4.7	60.5	7.3	47.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	9.5	21.5	4.5	66.5	6.5	24.5	6.5	64.5				
Max Q Clear Time (g_c+I1), s	4.4	2.0	2.5	21.6	2.1	4.5	2.5	35.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	4.7	0.0	0.1	0.0	8.1				

Intersection Summary

HCM 6th Ctrl Delay 35.1
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

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

Lanes and Geometrics
3: Potomac St & E 104th Ave

Turnberry
07/13/2020

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%			0%			0%			0%			
Storage Length (ft)	575		0	450		0	200		0	0		0	
Storage Lanes	1		0	1		0	1		0	1		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt					0.950					0.908			0.855
Flt Protected	0.950				0.950				0.950				0.950
Satd. Flow (prot)	1770	3539	0	1770	3362	0	1770	1691	0	1770	1593	0	
Flt Permitted	0.322				0.329				0.721				0.627
Satd. Flow (perm)	600	3539	0	613	3362	0	1343	1691	0	1168	1593	0	
Right Turn on Red				Yes				Yes				Yes	
Satd. Flow (RTOR)					103					22			53
Link Speed (mph)					45					40			40
Link Distance (ft)					3949					1321			1965
Travel Time (s)					59.8					20.0			33.5

Intersection Summary

Area Type: Other

Timings 3: Potomac St & E 104th Ave

Turnberry
07/13/2020

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	28	575	15	375	8	13	188	2
Future Volume (vph)	28	575	15	375	8	13	188	2
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	7	4
Switch Phase								
Minimum Initial (s)	3.0	10.0	3.0	10.0	3.0	5.0	3.0	5.0
Minimum Split (s)	9.0	40.0	9.0	28.0	8.0	30.0	8.0	30.0
Total Split (s)	9.0	45.0	9.0	45.0	8.0	30.0	16.0	38.0
Total Split (%)	9.0%	45.0%	9.0%	45.0%	8.0%	30.0%	16.0%	38.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	Max	None	Max
Act Effect Green (s)	45.6	44.4	44.4	42.6	28.4	25.4	41.0	39.4
Actuated g/C Ratio	0.46	0.44	0.44	0.43	0.28	0.25	0.41	0.39
v/c Ratio	0.10	0.40	0.05	0.41	0.02	0.08	0.38	0.08
Control Delay	14.7	20.5	14.3	18.0	18.6	16.6	22.1	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	20.5	14.3	18.0	18.6	16.6	22.1	6.9
LOS	B	C	B	B	B	B	C	A
Approach Delay		20.2		17.9		17.0		18.8
Approach LOS		C		B		B		B

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 67 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.41

Intersection Signal Delay: 19.0

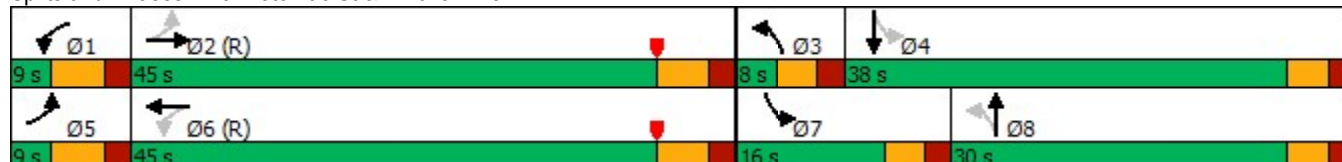
Intersection LOS: B

Intersection Capacity Utilization 49.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Potomac St & E 104th Ave



HCM 6th Signalized Intersection Summary

3: Potomac St & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	575	0	15	375	189	8	13	20	188	2	49
Future Volume (veh/h)	28	575	0	15	375	189	8	13	20	188	2	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	30	625	0	16	408	205	9	14	22	204	2	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	331	1485	0	326	947	470	421	164	257	573	20	530
Arrive On Green	0.02	0.42	0.00	0.01	0.41	0.41	0.01	0.25	0.25	0.10	0.34	0.34
Sat Flow, veh/h	1781	3647	0	1781	2300	1142	1781	655	1030	1781	58	1536
Grp Volume(v), veh/h	30	625	0	16	314	299	9	0	36	204	0	55
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1665	1781	0	1685	1781	0	1594
Q Serve(g_s), s	1.0	12.4	0.0	0.5	12.6	12.9	0.4	0.0	1.6	8.1	0.0	2.3
Cycle Q Clear(g_c), s	1.0	12.4	0.0	0.5	12.6	12.9	0.4	0.0	1.6	8.1	0.0	2.3
Prop In Lane	1.00		0.00	1.00		0.69	1.00		0.61	1.00		0.96
Lane Grp Cap(c), veh/h	331	1485	0	326	731	685	421	0	421	573	0	550
V/C Ratio(X)	0.09	0.42	0.00	0.05	0.43	0.44	0.02	0.00	0.09	0.36	0.00	0.10
Avail Cap(c_a), veh/h	354	1485	0	360	731	685	463	0	421	589	0	550
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.5	20.6	0.0	17.5	21.0	21.1	27.8	0.0	28.7	22.4	0.0	22.2
Incr Delay (d2), s/veh	0.1	0.8	0.0	0.1	1.8	2.0	0.0	0.0	0.4	0.4	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	8.4	0.0	0.4	9.0	8.7	0.3	0.0	1.2	6.0	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.6	21.4	0.0	17.6	22.9	23.1	27.8	0.0	29.1	22.8	0.0	22.6
LnGrp LOS	B	C	A	B	C	C	C	A	C	C	A	C
Approach Vol, veh/h	655			629			45			259		
Approach Delay, s/veh	21.2			22.9			28.9			22.7		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	47.8	5.7	39.5	7.7	47.2	15.1	30.0				
Change Period (Y+Rc), s	6.0	6.0	5.0	5.0	6.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	3.0	39.0	3.0	33.0	3.0	39.0	11.0	25.0				
Max Q Clear Time (g_c+I1), s	2.5	14.4	2.4	4.3	3.0	14.9	10.1	3.6				
Green Ext Time (p_c), s	0.0	4.0	0.0	0.2	0.0	3.5	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay	22.3											
HCM 6th LOS	C											

Lanes and Geometrics
4: Peoria St/Revere St & E 96th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%			
Storage Length (ft)	150		250	220		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt												
Flt Protected				0.950								
Satd. Flow (prot)	1863	1863	1863	1770	1863	0	0	1863	0	0	1863	0
Flt Permitted				0.950								
Satd. Flow (perm)	1863	1863	1863	1770	1863	0	0	1863	0	0	1863	0
Link Speed (mph)	45				45		40				40	
Link Distance (ft)	1911				4445		904				2404	
Travel Time (s)	29.0				67.3		15.4				41.0	
Intersection Summary												
Area Type:	Other											

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	378	0	1	704	1	0	0	0	0	0	0
Future Vol, veh/h	0	378	0	1	704	1	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	411	0	1	765	1	0	0	0	0	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	766	0	0	411	0	0	1179	1179	411	1179	1179	766
Stage 1	-	-	-	-	-	-	411	411	-	768	768	-
Stage 2	-	-	-	-	-	-	768	768	-	411	411	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	847	-	-	1148	-	-	167	190	641	167	190	403
Stage 1	-	-	-	-	-	-	618	595	-	394	411	-
Stage 2	-	-	-	-	-	-	394	411	-	618	595	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	847	-	-	1148	-	-	167	190	641	167	190	403
Mov Cap-2 Maneuver	-	-	-	-	-	-	167	190	-	167	190	-
Stage 1	-	-	-	-	-	-	618	595	-	394	411	-
Stage 2	-	-	-	-	-	-	394	411	-	618	595	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			0			0		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	847	-	-	1148	-	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.001	-	-	-				
HCM Control Delay (s)	0	0	-	-	8.1	-	-	0				
HCM Lane LOS	A	A	-	-	A	-	-	A				
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	-				

Lanes and Geometrics
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%		0%		0%		0%		0%		0%	
Storage Length (ft)	500		880	450		300	700		500	800		500
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850				0.850				0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.159			0.110			0.516			0.323		
Satd. Flow (perm)	575	3539	1583	398	3539	1583	961	3539	1583	602	3539	1583
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)			209				209				422	
Link Speed (mph)	45				45				55		55	
Link Distance (ft)	1177				1609				1840		1644	
Travel Time (s)	17.8				24.4				22.8		20.4	

Intersection Summary

Area Type: Other

Timings
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	883	131	184	725	60	338	704	388	37	255	49
Future Volume (vph)	127	883	131	184	725	60	338	704	388	37	255	49
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	10.0	35.0		10.0	35.0		11.0	48.0		10.0	48.0	
Total Split (s)	10.0	43.0		10.0	43.0		17.0	57.0		10.0	50.0	
Total Split (%)	8.3%	35.8%		8.3%	35.8%		14.2%	47.5%		8.3%	41.7%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	41.4	36.4	120.0	41.4	36.4	120.0	63.6	54.3	120.0	51.4	45.0	120.0
Actuated g/C Ratio	0.34	0.30	1.00	0.34	0.30	1.00	0.53	0.45	1.00	0.43	0.38	1.00
v/c Ratio	0.44	0.89	0.09	0.76	0.73	0.04	0.62	0.48	0.27	0.13	0.21	0.03
Control Delay	27.6	51.5	0.1	49.2	21.5	0.1	23.1	25.1	0.4	16.0	26.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	51.5	0.1	49.2	21.5	0.1	23.1	25.1	0.4	16.0	26.3	0.0
LOS	C	D	A	D	C	A	C	C	A	B	C	A
Approach Delay		42.9			25.4			17.9			21.4	
Approach LOS		D			C			B			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 27.4

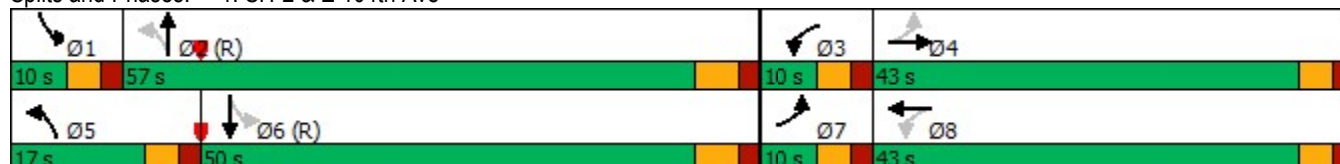
Intersection LOS: C

Intersection Capacity Utilization 72.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: SH-2 & E 104th Ave



HCM 6th Signalized Intersection Summary

1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	127	883	131	184	725	60	338	704	388	37	255	49
Future Volume (veh/h)	127	883	131	184	725	60	338	704	388	37	255	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	138	960	0	200	788	0	367	765	0	40	277	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	446	1057		307	1057		606	1617		329	1371	
Arrive On Green	0.04	0.30	0.00	0.08	0.60	0.00	0.10	0.46	0.00	0.03	0.39	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	138	960	0	200	788	0	367	765	0	40	277	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.3	31.2	0.0	5.0	19.4	0.0	12.0	17.9	0.0	1.6	6.2	0.0
Cycle Q Clear(g_c), s	3.3	31.2	0.0	5.0	19.4	0.0	12.0	17.9	0.0	1.6	6.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	446	1057		307	1057		606	1617		329	1371	
V/C Ratio(X)	0.31	0.91		0.65	0.75		0.61	0.47		0.12	0.20	
Avail Cap(c_a), veh/h	446	1125		307	1125		606	1617		349	1371	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.82	0.82	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.0	40.6	0.0	31.2	21.0	0.0	20.7	22.7	0.0	21.3	24.5	0.0
Incr Delay (d2), s/veh	0.4	10.3	0.0	4.0	2.1	0.0	1.7	1.0	0.0	0.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.4	20.8	0.0	3.7	8.9	0.0	10.1	11.5	0.0	1.2	4.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.4	50.9	0.0	35.2	23.1	0.0	22.4	23.7	0.0	21.5	24.9	0.0
LnGrp LOS	C	D		D	C		C	C		C	C	
Approach Vol, veh/h		1098	A		988	A		1132	A		317	A
Approach Delay, s/veh		48.2			25.6			23.3			24.4	
Approach LOS		D			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	60.6	10.0	40.7	17.0	52.3	10.0	40.7				
Change Period (Y+Rc), s	5.0	6.0	5.0	5.0	5.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	5.0	51.0	5.0	38.0	12.0	44.0	5.0	38.0				
Max Q Clear Time (g_c+I1), s	3.6	19.9	7.0	33.2	14.0	8.2	5.3	21.4				
Green Ext Time (p_c), s	0.0	4.9	0.0	2.5	0.0	1.6	0.0	4.6				

Intersection Summary

HCM 6th Ctrl Delay	31.8
HCM 6th LOS	C

Notes

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

Lanes and Geometrics
2: Revere St & E 104th Ave

Turnberry
07/13/2020

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	 	 			 			 			 		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%				0%				0%		0%		
Storage Length (ft)	330		0	375		300	200		0	100		0	
Storage Lanes	2		1	1		1	1		0	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt			0.850				0.850		0.862				0.850
Flt Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	1606	0	1770	1863	1583	
Flt Permitted	0.194			0.081			0.757			0.660			
Satd. Flow (perm)	701	3539	1583	151	3539	1583	1410	1606	0	1229	1863	1583	
Right Turn on Red			Yes				Yes		Yes				Yes
Satd. Flow (RTOR)			136				136		12				95
Link Speed (mph)	45				45				30		30		
Link Distance (ft)	1609				3949				939		852		
Travel Time (s)	24.4				59.8				21.3		19.4		

Intersection Summary

Area Type: Other

Timings 2: Revere St & E 104th Ave

Turnberry
07/13/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	 	 			 			 		 	
Traffic Volume (vph)	63	1229	3	20	869	47	11	1	77	1	34
Future Volume (vph)	63	1229	3	20	869	47	11	1	77	1	34
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		Free	8		Free	2		6		6
Detector Phase	7	4		3	8		5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5	6.5	14.0	14.0
Total Split (s)	10.0	72.0		10.0	72.0		10.0	26.0	12.0	28.0	28.0
Total Split (%)	8.3%	60.0%		8.3%	60.0%		8.3%	21.7%	10.0%	23.3%	23.3%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max	None	C-Max	C-Max
Act Effect Green (s)	61.2	57.9	120.0	60.3	55.9	120.0	41.1	36.1	46.5	42.6	42.6
Actuated g/C Ratio	0.51	0.48	1.00	0.50	0.47	1.00	0.34	0.30	0.39	0.36	0.36
v/c Ratio	0.14	0.78	0.00	0.15	0.57	0.03	0.02	0.03	0.16	0.00	0.06
Control Delay	22.1	44.6	0.0	12.2	24.3	0.0	28.8	20.0	28.2	37.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.1	44.6	0.0	12.2	24.3	0.0	28.8	20.0	28.2	37.0	0.2
LOS	C	D	A	B	C	A	C	B	C	D	A
Approach Delay		43.4			22.8			24.2		19.8	
Approach LOS		D			C			C		B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 34.0

Intersection LOS: C

Intersection Capacity Utilization 52.4%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Revere St & E 104th Ave

							
Ø1	Ø2 (R)	Ø3	Ø4	Ø5	Ø6 (R)	Ø7	Ø8
12 s	26 s	10 s	72 s	10 s	28 s	10 s	72 s

HCM 6th Signalized Intersection Summary

2: Revere St & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	1229	3	20	869	47	11	1	11	77	1	34
Future Volume (veh/h)	63	1229	3	20	869	47	11	1	11	77	1	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	1336	0	22	945	0	12	1	12	84	1	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	483	1564		124	1475		558	44	525	626	731	619
Arrive On Green	0.04	0.44	0.00	0.01	0.42	0.00	0.01	0.35	0.35	0.04	0.39	0.39
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	1781	123	1480	1781	1870	1585
Grp Volume(v), veh/h	68	1336	0	22	945	0	12	0	13	84	1	37
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1781	0	1604	1781	1870	1585
Q Serve(g_s), s	1.3	40.5	0.0	0.9	25.4	0.0	0.5	0.0	0.6	3.5	0.0	1.7
Cycle Q Clear(g_c), s	1.3	40.5	0.0	0.9	25.4	0.0	0.5	0.0	0.6	3.5	0.0	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.92	1.00		1.00
Lane Grp Cap(c), veh/h	483	1564		124	1475		558	0	568	626	731	619
V/C Ratio(X)	0.14	0.85		0.18	0.64		0.02	0.00	0.02	0.13	0.00	0.06
Avail Cap(c_a), veh/h	512	1999		184	1999		627	0	568	660	731	619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.67	0.67	0.00	0.62	0.62	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.1	30.1	0.0	26.1	28.0	0.0	24.6	0.0	25.2	21.7	22.3	22.8
Incr Delay (d2), s/veh	0.1	2.1	0.0	0.4	0.3	0.0	0.0	0.0	0.1	0.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	22.1	0.0	0.6	14.5	0.0	0.4	0.0	0.5	2.7	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.1	32.3	0.0	26.5	28.3	0.0	24.7	0.0	25.3	21.8	22.3	23.0
LnGrp LOS	C	C		C	C		C	A	C	C	C	C
Approach Vol, veh/h	1404		A	967		A	25		122			
Approach Delay, s/veh	31.7			28.2			25.0		22.2			
Approach LOS	C			C			C		C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.7	47.0	6.0	57.3	5.3	51.4	9.0	54.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.5	21.5	5.5	67.5	5.5	23.5	5.5	67.5				
Max Q Clear Time (g_c+I1), s	5.5	2.6	2.9	42.5	2.5	3.7	3.3	27.4				
Green Ext Time (p_c), s	0.0	0.0	0.0	10.3	0.0	0.1	0.0	7.3				

Intersection Summary

HCM 6th Ctrl Delay	29.8
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

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

Lanes and Geometrics
3: Potomac St & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%			0%		
Storage Length (ft)	575		0	450		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.999			0.978			0.907			0.853		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3536	0	1770	3461	0	1770	1690	0	1770	1589	0
Flt Permitted	0.090			0.096			0.722			0.661		
Satd. Flow (perm)	168	3536	0	179	3461	0	1345	1690	0	1231	1589	0
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)				26			18			52		
Link Speed (mph)	45			45			40			40		
Link Distance (ft)	3949			1321			1965			1374		
Travel Time (s)	59.8			20.0			33.5			23.4		

Intersection Summary

Area Type: Other

Timings 3: Potomac St & E 104th Ave

Turnberry
07/13/2020

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	56	1200	10	931	3	10	200	1
Future Volume (vph)	56	1200	10	931	3	10	200	1
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	7	4
Switch Phase								
Minimum Initial (s)	3.0	10.0	3.0	10.0	3.0	5.0	3.0	5.0
Minimum Split (s)	9.0	40.0	9.0	28.0	8.0	30.0	8.0	30.0
Total Split (s)	10.0	52.0	9.0	51.0	8.0	30.0	9.0	31.0
Total Split (%)	10.0%	52.0%	9.0%	51.0%	8.0%	30.0%	9.0%	31.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	Max	None	Max
Act Effect Green (s)	54.0	53.2	49.4	47.0	28.0	25.0	33.2	32.4
Actuated g/C Ratio	0.54	0.53	0.49	0.47	0.28	0.25	0.33	0.32
v/c Ratio	0.40	0.70	0.08	0.73	0.01	0.07	0.50	0.10
Control Delay	18.2	20.5	11.7	24.6	22.0	17.0	31.2	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	20.5	11.7	24.6	22.0	17.0	31.2	8.4
LOS	B	C	B	C	C	B	C	A
Approach Delay		20.4		24.5		17.5		26.7
Approach LOS		C		C		B		C

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 67 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 22.7

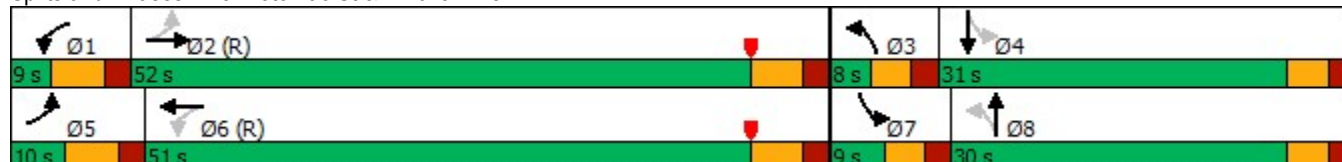
Intersection LOS: C

Intersection Capacity Utilization 68.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Potomac St & E 104th Ave



HCM 6th Signalized Intersection Summary

3: Potomac St & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	1200	5	10	931	164	3	10	17	200	1	48
Future Volume (veh/h)	56	1200	5	10	931	164	3	10	17	200	1	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	1304	5	11	1012	178	3	11	18	217	1	52
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	215	1750	7	167	1386	243	414	160	261	470	9	449
Arrive On Green	0.03	0.48	0.48	0.01	0.46	0.46	0.00	0.25	0.25	0.04	0.29	0.29
Sat Flow, veh/h	1781	3631	14	1781	3021	531	1781	638	1044	1781	30	1560
Grp Volume(v), veh/h	61	638	671	11	595	595	3	0	29	217	0	53
Grp Sat Flow(s),veh/h/ln	1781	1777	1868	1781	1777	1775	1781	0	1682	1781	0	1590
Q Serve(g_s), s	1.8	29.0	29.0	0.3	27.2	27.3	0.1	0.0	1.3	4.0	0.0	2.5
Cycle Q Clear(g_c), s	1.8	29.0	29.0	0.3	27.2	27.3	0.1	0.0	1.3	4.0	0.0	2.5
Prop In Lane	1.00		0.01	1.00		0.30	1.00		0.62	1.00		0.98
Lane Grp Cap(c), veh/h	215	857	900	167	815	814	414	0	421	470	0	457
V/C Ratio(X)	0.28	0.74	0.75	0.07	0.73	0.73	0.01	0.00	0.07	0.46	0.00	0.12
Avail Cap(c_a), veh/h	231	857	900	206	815	814	463	0	421	470	0	457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	0.59	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.8	20.9	20.9	18.0	22.0	22.0	28.0	0.0	28.6	29.5	0.0	26.3
Incr Delay (d2), s/veh	0.4	3.5	3.3	0.2	5.7	5.7	0.0	0.0	0.3	0.7	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	15.9	16.6	0.2	17.1	17.2	0.1	0.0	1.0	4.2	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.2	24.4	24.3	18.1	27.7	27.8	28.0	0.0	28.9	30.3	0.0	26.8
LnGrp LOS	B	C	C	B	C	C	C	A	C	C	A	C
Approach Vol, veh/h	1370			1201			32			270		
Approach Delay, s/veh	24.1			27.6			28.8			29.6		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.8	54.2	5.2	33.8	9.1	51.9	9.0	30.0				
Change Period (Y+Rc), s	6.0	6.0	5.0	5.0	6.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	3.0	46.0	3.0	26.0	4.0	45.0	4.0	25.0				
Max Q Clear Time (g_c+l1), s	2.3	31.0	2.1	4.5	3.8	29.3	6.0	3.3				
Green Ext Time (p_c), s	0.0	7.1	0.0	0.2	0.0	6.6	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay	26.1											
HCM 6th LOS	C											

Lanes and Geometrics
4: Peoria St/Revere St & E 96th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%			
Storage Length (ft)	150		250	220		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt					0.999		0.910				0.865	
Flt Protected					0.950							
Satd. Flow (prot)	1863	1863	1863	1770	1861	0	0	1695	0	0	1611	0
Flt Permitted					0.950							
Satd. Flow (perm)	1863	1863	1863	1770	1861	0	0	1695	0	0	1611	0
Link Speed (mph)	45				45		40				40	
Link Distance (ft)	1911				4445		904				2404	
Travel Time (s)	29.0				67.3		15.4				41.0	
Intersection Summary												
Area Type:	Other											

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	744	0	1	524	3	0	1	2	0	0	6
Future Vol, veh/h	0	744	0	1	524	3	0	1	2	0	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	809	0	1	570	3	0	1	2	0	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	573	0	0	809	0	0	1386	1384	809	1385	1383	572
Stage 1	-	-	-	-	-	-	809	809	-	574	574	-
Stage 2	-	-	-	-	-	-	577	575	-	811	809	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1000	-	-	817	-	-	120	143	380	121	144	520
Stage 1	-	-	-	-	-	-	374	394	-	504	503	-
Stage 2	-	-	-	-	-	-	502	503	-	373	394	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1000	-	-	817	-	-	118	143	380	120	144	520
Mov Cap-2 Maneuver	-	-	-	-	-	-	118	143	-	120	144	-
Stage 1	-	-	-	-	-	-	374	394	-	504	502	-
Stage 2	-	-	-	-	-	-	495	502	-	370	394	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			19.9			12		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	245	1000	-	-	817	-	-	520
HCM Lane V/C Ratio	0.013	-	-	-	0.001	-	-	0.013
HCM Control Delay (s)	19.9	0	-	-	9.4	-	-	12
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Lanes and Geometrics
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%			
Storage Length (ft)	500			880	450			300	700			500
Storage Lanes	2			1	2			1	1			1
Taper Length (ft)	25				25				25			
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850				0.850				0.850	
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.221			0.186				0.288				0.576
Satd. Flow (perm)	799	3539	1583	672	3539	1583	536	3539	1583	1073	3539	1583
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)			247				419				209	
Link Speed (mph)	45				45				55		55	
Link Distance (ft)	1177				1609				1840		1644	
Travel Time (s)	17.8				24.4				22.8		20.4	

Intersection Summary

Area Type: Other

Timings
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 			 		 	 	
Traffic Volume (vph)	75	490	227	407	720	408	100	264	130	23	620	85
Future Volume (vph)	75	490	227	407	720	408	100	264	130	23	620	85
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	10.0	35.0		10.0	35.0		11.0	48.0		10.0	48.0	
Total Split (s)	10.0	36.0		20.0	46.0		11.0	54.0		10.0	53.0	
Total Split (%)	8.3%	30.0%		16.7%	38.3%		9.2%	45.0%		8.3%	44.2%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	28.8	23.8	120.0	43.5	35.5	120.0	65.0	58.8	120.0	59.5	52.5	120.0
Actuated g/C Ratio	0.24	0.20	1.00	0.36	0.30	1.00	0.54	0.49	1.00	0.50	0.44	1.00
v/c Ratio	0.27	0.76	0.16	0.76	0.75	0.28	0.29	0.17	0.09	0.04	0.44	0.06
Control Delay	26.9	52.6	0.2	36.5	43.2	0.4	16.1	19.3	0.1	14.3	25.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	52.6	0.2	36.5	43.2	0.4	16.1	19.3	0.1	14.3	25.5	0.1
LOS	C	D	A	D	D	A	B	B	A	B	C	A
Approach Delay		35.1			30.1			13.6			22.2	
Approach LOS		D			C			B			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 27.3

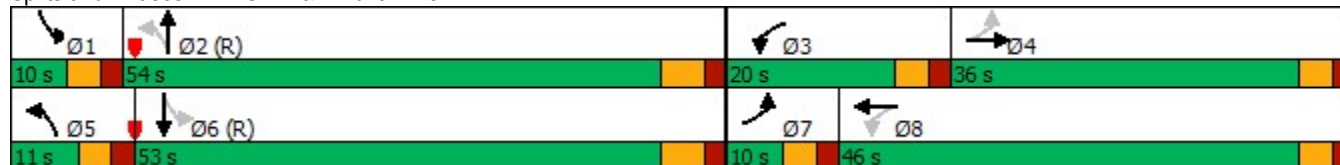
Intersection LOS: C

Intersection Capacity Utilization 65.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: SH-2 & E 104th Ave



HCM 6th Signalized Intersection Summary

1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	490	227	407	720	408	100	264	130	23	620	85
Future Volume (veh/h)	75	490	227	407	720	408	100	264	130	23	620	85
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	82	533	0	442	783	0	109	287	0	25	674	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	325	646		592	928		415	1782		602	1700	
Arrive On Green	0.04	0.18	0.00	0.12	0.26	0.00	0.05	0.50	0.00	0.02	0.48	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	82	533	0	442	783	0	109	287	0	25	674	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	2.3	17.3	0.0	12.0	25.1	0.0	3.7	5.3	0.0	0.9	14.6	0.0
Cycle Q Clear(g_c), s	2.3	17.3	0.0	12.0	25.1	0.0	3.7	5.3	0.0	0.9	14.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	325	646		592	928		415	1782		602	1700	
V/C Ratio(X)	0.25	0.83		0.75	0.84		0.26	0.16		0.04	0.40	
Avail Cap(c_a), veh/h	334	918		615	1214		422	1782		634	1700	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.4	47.3	0.0	34.2	42.0	0.0	15.5	16.2	0.0	15.1	20.1	0.0
Incr Delay (d2), s/veh	0.4	4.3	0.0	4.8	4.4	0.0	0.3	0.2	0.0	0.0	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.7	12.4	0.0	9.0	16.6	0.0	2.5	3.6	0.0	0.6	9.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.8	51.5	0.0	39.0	46.4	0.0	15.8	16.4	0.0	15.1	20.8	0.0
LnGrp LOS	D	D		D	D		B	B		B	C	
Approach Vol, veh/h		615	A		1225	A		396	A		699	A
Approach Delay, s/veh		49.8			43.7			16.3			20.6	
Approach LOS		D			D			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.8	66.2	19.2	26.8	10.6	63.4	9.7	36.3				
Change Period (Y+Rc), s	5.0	6.0	5.0	5.0	5.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	5.0	48.0	15.0	31.0	6.0	47.0	5.0	41.0				
Max Q Clear Time (g_c+l1), s	2.9	7.3	14.0	19.3	5.7	16.6	4.3	27.1				
Green Ext Time (p_c), s	0.0	1.6	0.2	2.5	0.0	4.2	0.0	4.2				
Intersection Summary												
HCM 6th Ctrl Delay			35.8									
HCM 6th LOS			D									

Notes

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

Lanes and Geometrics
2: Revere St & E 104th Ave

Turnberry
07/13/2020

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%		0%		0%		0%		0%		0%		
Storage Length (ft)	330		0	375		300	200		0	100		0	
Storage Lanes	2		1	1		1	1		0	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt			0.850				0.850		0.903				0.850
Flt Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	1682	0	1770	1863	1583	
Flt Permitted	0.109			0.283			0.744			0.720			
Satd. Flow (perm)	394	3539	1583	527	3539	1583	1386	1682	0	1341	1863	1583	
Right Turn on Red			Yes				Yes		Yes				Yes
Satd. Flow (RTOR)			136				136		37				95
Link Speed (mph)	30				30				30		30		
Link Distance (ft)	1727				1743				1045		913		
Travel Time (s)	39.3				39.6				23.8		20.8		

Intersection Summary

Area Type: Other

Timings 2: Revere St & E 104th Ave

Turnberry
07/13/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	22	622	29	21	982	40	71	18	60	6	54
Future Volume (vph)	22	622	29	21	982	40	71	18	60	6	54
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		Free	8		Free	2		6		6
Detector Phase	7	4		3	8		5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5	9.5	22.5	22.5
Total Split (s)	11.0	68.0		11.0	68.0		13.0	28.0	13.0	28.0	28.0
Total Split (%)	9.2%	56.7%		9.2%	56.7%		10.8%	23.3%	10.8%	23.3%	23.3%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max	None	C-Max	C-Max
Act Effect Green (s)	51.3	47.5	120.0	51.5	47.6	120.0	53.8	46.3	52.9	45.9	45.9
Actuated g/C Ratio	0.43	0.40	1.00	0.43	0.40	1.00	0.45	0.39	0.44	0.38	0.38
v/c Ratio	0.07	0.48	0.02	0.08	0.76	0.03	0.12	0.08	0.10	0.01	0.09
Control Delay	14.6	27.6	0.0	14.7	34.7	0.0	21.9	16.2	22.1	33.5	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.6	27.6	0.0	14.7	34.7	0.0	21.9	16.2	22.1	33.5	2.5
LOS	B	C	A	B	C	A	C	B	C	C	A
Approach Delay		26.0			32.9			19.5		13.9	
Approach LOS		C			C			B		B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 28.5

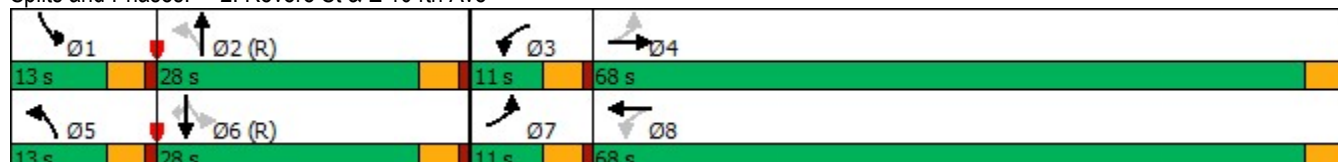
Intersection LOS: C

Intersection Capacity Utilization 46.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Revere St & E 104th Ave



HCM 6th Signalized Intersection Summary

2: Revere St & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	622	29	21	982	40	71	18	34	60	6	54
Future Volume (veh/h)	22	622	29	21	982	40	71	18	34	60	6	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	676	0	23	1067	0	77	20	37	65	7	59
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	295	1300		265	1298		691	250	462	670	792	671
Arrive On Green	0.02	0.37	0.00	0.02	0.37	0.00	0.04	0.42	0.42	0.04	0.42	0.42
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	1781	588	1087	1781	1870	1585
Grp Volume(v), veh/h	24	676	0	23	1067	0	77	0	57	65	7	59
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1781	0	1675	1781	1870	1585
Q Serve(g_s), s	0.5	17.9	0.0	1.0	32.7	0.0	2.9	0.0	2.4	2.5	0.3	2.7
Cycle Q Clear(g_c), s	0.5	17.9	0.0	1.0	32.7	0.0	2.9	0.0	2.4	2.5	0.3	2.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.65	1.00		1.00
Lane Grp Cap(c), veh/h	295	1300		265	1298		691	0	712	670	792	671
V/C Ratio(X)	0.08	0.52		0.09	0.82		0.11	0.00	0.08	0.10	0.01	0.09
Avail Cap(c_a), veh/h	403	1880		322	1880		749	0	712	731	792	671
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.2	29.8	0.0	24.2	34.5	0.0	18.2	0.0	20.5	18.2	20.0	20.7
Incr Delay (d2), s/veh	0.1	0.3	0.0	0.1	2.0	0.0	0.1	0.0	0.2	0.1	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	12.2	0.0	0.8	20.5	0.0	2.2	0.0	1.8	1.9	0.2	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	30.1	0.0	24.3	36.6	0.0	18.2	0.0	20.8	18.2	20.1	21.0
LnGrp LOS	C	C		C	D		B	A	C	B	C	C
Approach Vol, veh/h		700	A		1090	A		134			131	
Approach Delay, s/veh		30.0			36.3			19.3			19.6	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	55.5	7.2	48.4	9.1	55.3	7.3	48.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	23.5	6.5	63.5	8.5	23.5	6.5	63.5				
Max Q Clear Time (g_c+I1), s	4.5	4.4	3.0	19.9	4.9	4.7	2.5	34.7				
Green Ext Time (p_c), s	0.0	0.2	0.0	5.5	0.0	0.1	0.0	9.2				

Intersection Summary

HCM 6th Ctrl Delay	32.0
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

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

Lanes and Geometrics
3: Potomac St & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%			0%		
Storage Length (ft)	575		0	450		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.976					0.908		0.855
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	0	1770	3454	0	1770	1691	0	1770	1593	0
Flt Permitted	0.096			0.330			0.720			0.626		
Satd. Flow (perm)	179	3539	0	615	3454	0	1341	1691	0	1166	1593	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					28					54		
Link Speed (mph)	45				45		40			40		
Link Distance (ft)	3949				1321		1965			1374		
Travel Time (s)	59.8				20.0		33.5			23.4		

Intersection Summary

Area Type: Other

Timings 3: Potomac St & E 104th Ave

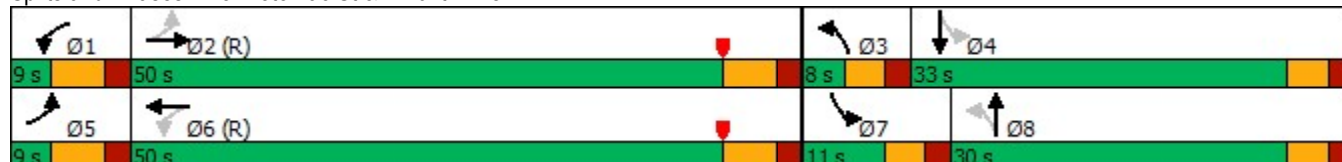
Turnberry
07/13/2020

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	30	607	15	986	8	13	188	2
Future Volume (vph)	30	607	15	986	8	13	188	2
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	7	4
Switch Phase								
Minimum Initial (s)	3.0	10.0	3.0	10.0	3.0	5.0	3.0	5.0
Minimum Split (s)	9.0	40.0	9.0	28.0	8.0	30.0	8.0	30.0
Total Split (s)	9.0	50.0	9.0	50.0	8.0	30.0	11.0	33.0
Total Split (%)	9.0%	50.0%	9.0%	50.0%	8.0%	30.0%	11.0%	33.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	Max	None	Max
Act Effect Green (s)	50.6	49.4	49.4	47.6	28.0	25.0	35.6	34.4
Actuated g/C Ratio	0.51	0.49	0.49	0.48	0.28	0.25	0.36	0.34
v/c Ratio	0.24	0.38	0.05	0.77	0.02	0.08	0.45	0.10
Control Delay	15.7	17.3	11.7	25.9	21.1	16.6	27.6	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	17.3	11.7	25.9	21.1	16.6	27.6	8.1
LOS	B	B	B	C	C	B	C	A
Approach Delay		17.2		25.8		17.5		23.4
Approach LOS		B		C		B		C

Intersection Summary

Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 67 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 22.7	Intersection LOS: C
Intersection Capacity Utilization 59.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Potomac St & E 104th Ave



HCM 6th Signalized Intersection Summary

3: Potomac St & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	607	0	15	986	189	8	13	20	188	2	50
Future Volume (veh/h)	30	607	0	15	986	189	8	13	20	188	2	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	660	0	16	1072	205	9	14	22	204	2	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	166	1632	0	351	1346	257	421	164	257	499	17	466
Arrive On Green	0.02	0.46	0.00	0.01	0.45	0.45	0.01	0.25	0.25	0.06	0.30	0.30
Sat Flow, veh/h	1781	3647	0	1781	2977	568	1781	655	1030	1781	57	1537
Grp Volume(v), veh/h	33	660	0	16	638	639	9	0	36	204	0	56
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1768	1781	0	1685	1781	0	1594
Q Serve(g_s), s	1.0	12.3	0.0	0.5	30.7	31.0	0.4	0.0	1.6	6.0	0.0	2.5
Cycle Q Clear(g_c), s	1.0	12.3	0.0	0.5	30.7	31.0	0.4	0.0	1.6	6.0	0.0	2.5
Prop In Lane	1.00		0.00	1.00		0.32	1.00		0.61	1.00		0.96
Lane Grp Cap(c), veh/h	166	1632	0	351	803	799	421	0	421	499	0	483
V/C Ratio(X)	0.20	0.40	0.00	0.05	0.79	0.80	0.02	0.00	0.09	0.41	0.00	0.12
Avail Cap(c_a), veh/h	187	1632	0	386	803	799	462	0	421	499	0	483
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.5	18.0	0.0	15.3	23.4	23.5	27.8	0.0	28.7	26.4	0.0	25.1
Incr Delay (d2), s/veh	0.6	0.7	0.0	0.1	8.0	8.2	0.0	0.0	0.4	0.5	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	8.4	0.0	0.3	19.4	19.5	0.3	0.0	1.2	6.9	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.1	18.7	0.0	15.3	31.4	31.7	27.8	0.0	29.1	26.9	0.0	25.6
LnGrp LOS	C	B	A	B	C	C	C	A	C	C	A	C
Approach Vol, veh/h	693			1293			45			260		
Approach Delay, s/veh	18.8			31.4			28.9			26.7		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	51.9	5.7	35.3	7.8	51.2	11.0	30.0				
Change Period (Y+Rc), s	6.0	6.0	5.0	5.0	6.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	3.0	44.0	3.0	28.0	3.0	44.0	6.0	25.0				
Max Q Clear Time (g_c+l1), s	2.5	14.3	2.4	4.5	3.0	33.0	8.0	3.6				
Green Ext Time (p_c), s	0.0	4.4	0.0	0.2	0.0	5.8	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay	27.0											
HCM 6th LOS	C											

Lanes and Geometrics
4: Peoria St./Peoria Pkwy & E 96th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%			
Storage Length (ft)	150		250	220		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt					0.998							
Flt Protected	0.950			0.950							0.984	
Satd. Flow (prot)	1770	1863	1863	1770	1859	0	0	1863	0	0	1666	0
Flt Permitted	0.950			0.950							0.984	
Satd. Flow (perm)	1770	1863	1863	1770	1859	0	0	1863	0	0	1666	0
Link Speed (mph)	45				45				40		40	
Link Distance (ft)	1911				4445				904		2821	
Travel Time (s)	29.0				67.3				15.4		48.1	
Intersection Summary												
Area Type:	Other											

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	378	0	1	704	7	0	0	0	17	0	34
Future Vol, veh/h	11	378	0	1	704	7	0	0	0	17	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	411	0	1	765	8	0	0	0	18	0	37

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	773	0	0	411	0	0	1225	1210	411	1206	1206	769
Stage 1	-	-	-	-	-	-	435	435	-	771	771	-
Stage 2	-	-	-	-	-	-	790	775	-	435	435	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	842	-	-	1148	-	-	156	183	641	160	184	401
Stage 1	-	-	-	-	-	-	600	580	-	393	410	-
Stage 2	-	-	-	-	-	-	383	408	-	600	580	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	842	-	-	1148	-	-	140	180	641	158	181	401
Mov Cap-2 Maneuver	-	-	-	-	-	-	140	180	-	158	181	-
Stage 1	-	-	-	-	-	-	592	572	-	387	410	-
Stage 2	-	-	-	-	-	-	347	408	-	591	572	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0			0			22.1		
HCM LOS							A			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	842	-	-	1148	-	-	265
HCM Lane V/C Ratio	-	0.014	-	-	0.001	-	-	0.209
HCM Control Delay (s)	0	9.3	-	-	8.1	-	-	22.1
HCM Lane LOS	A	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.8

Lanes and Geometrics
5: Peoria Pkwy/Revere St & E. 102nd Pl

Turnberry
07/13/2020



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.961				0.958	
Flt Protected	0.966		0.950			
Satd. Flow (prot)	1729	0	1770	1863	1785	0
Flt Permitted	0.966		0.950			
Satd. Flow (perm)	1729	0	1770	1863	1785	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	820			646	1243	
Travel Time (s)	18.6			14.7	28.3	

Intersection Summary

Area Type: Other

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	36	15	5	84	27	12
Future Vol, veh/h	36	15	5	84	27	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	16	5	91	29	13

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	137	36	42
Stage 1	36	-	-
Stage 2	101	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	856	1037	1567
Stage 1	986	-	-
Stage 2	923	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	853	1037	1567
Mov Cap-2 Maneuver	853	-	-
Stage 1	983	-	-
Stage 2	923	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1567	-	900	-	-
HCM Lane V/C Ratio	0.003	-	0.062	-	-
HCM Control Delay (s)	7.3	-	9.3	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Lanes and Geometrics
6: Peoria Pkwy & Quentin St.

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt		0.963			0.909			0.994			0.992	
Flt Protected		0.965			0.984		0.950			0.950		
Satd. Flow (prot)	0	1731	0	0	1666	0	1770	1852	0	1770	1848	0
Flt Permitted		0.965			0.984		0.950			0.950		
Satd. Flow (perm)	0	1731	0	0	1666	0	1770	1852	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		575			833			463			646	
Travel Time (s)		13.1			18.9			10.5			14.7	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	0	3	9	0	19	1	63	3	6	34	2
Future Vol, veh/h	7	0	3	9	0	19	1	63	3	6	34	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	0	3	10	0	21	1	68	3	7	37	2
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	134	125	38	126	125	70	39	0	0	71	0	0
Stage 1	52	52	-	72	72	-	-	-	-	-	-	-
Stage 2	82	73	-	54	53	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	838	765	1034	848	765	993	1571	-	-	1529	-	-
Stage 1	961	852	-	938	835	-	-	-	-	-	-	-
Stage 2	926	834	-	958	851	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	817	760	1034	842	760	993	1571	-	-	1529	-	-
Mov Cap-2 Maneuver	817	760	-	842	760	-	-	-	-	-	-	-
Stage 1	960	848	-	937	834	-	-	-	-	-	-	-
Stage 2	906	833	-	951	847	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	9.2		9			0.1			1.1			
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1571	-	-	872	939	1529	-	-				
HCM Lane V/C Ratio	0.001	-	-	0.012	0.032	0.004	-	-				
HCM Control Delay (s)	7.3	-	-	9.2	9	7.4	-	-				
HCM Lane LOS	A	-	-	A	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-				

Lanes and Geometrics
7: Peoria Pkwy & E. 101st Ave.

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt		0.959			0.899			0.975			0.947	
Flt Protected		0.966			0.988		0.950			0.950		
Satd. Flow (prot)	0	1726	0	0	1655	0	1770	1816	0	1770	1764	0
Flt Permitted		0.966			0.988		0.950			0.950		
Satd. Flow (perm)	0	1726	0	0	1655	0	1770	1816	0	1770	1764	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		741			863			2821			463	
Travel Time (s)		16.8			19.6			64.1			10.5	
Intersection Summary												
Area Type:	Other											

Intersection												
Int Delay, s/veh	5.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	0	19	5	0	14	6	9	2	5	27	15
Future Vol, veh/h	44	0	19	5	0	14	6	9	2	5	27	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	48	0	21	5	0	15	7	10	2	5	29	16
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	80	73	37	83	80	11	45	0	0	12	0	0
Stage 1	47	47	-	25	25	-	-	-	-	-	-	-
Stage 2	33	26	-	58	55	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	908	817	1035	904	810	1070	1563	-	-	1607	-	-
Stage 1	967	856	-	993	874	-	-	-	-	-	-	-
Stage 2	983	874	-	954	849	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	890	811	1035	880	804	1070	1563	-	-	1607	-	-
Mov Cap-2 Maneuver	890	811	-	880	804	-	-	-	-	-	-	-
Stage 1	963	853	-	989	871	-	-	-	-	-	-	-
Stage 2	965	871	-	932	846	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	9.2		8.6			2.6			0.8			
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1563	-	-	929	1012	1607	-	-				
HCM Lane V/C Ratio	0.004	-	-	0.074	0.02	0.003	-	-				
HCM Control Delay (s)	7.3	-	-	9.2	8.6	7.2	-	-				
HCM Lane LOS	A	-	-	A	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-				

Lanes and Geometrics
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%			
Storage Length (ft)	500			880	450			300	700			500
Storage Lanes	2			1	2			1	1			1
Taper Length (ft)	25				25				25			
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850				0.850				0.850	
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.154			0.105				0.517				0.307
Satd. Flow (perm)	557	3539	1583	379	3539	1583	963	3539	1583	572	3539	1583
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)			164				164				447	
Link Speed (mph)	45				45				55		55	
Link Distance (ft)	1177				1609				1840		1644	
Travel Time (s)	17.8				24.4				22.8		20.4	

Intersection Summary

Area Type: Other

Timings
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	933	131	198	754	62	338	704	411	41	255	49
Future Volume (vph)	127	933	131	198	754	62	338	704	411	41	255	49
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	10.0	35.0		10.0	35.0		11.0	48.0		10.0	48.0	
Total Split (s)	10.0	44.0		10.0	44.0		15.0	56.0		10.0	51.0	
Total Split (%)	8.3%	36.7%		8.3%	36.7%		12.5%	46.7%		8.3%	42.5%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	43.0	38.0	120.0	43.0	38.0	120.0	62.0	52.9	120.0	51.3	45.2	120.0
Actuated g/C Ratio	0.36	0.32	1.00	0.36	0.32	1.00	0.52	0.44	1.00	0.43	0.38	1.00
v/c Ratio	0.43	0.90	0.09	0.82	0.73	0.04	0.64	0.49	0.28	0.15	0.21	0.03
Control Delay	26.6	51.3	0.1	49.8	40.8	0.0	25.3	26.1	0.4	16.6	25.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.6	51.3	0.1	49.8	40.8	0.0	25.3	26.1	0.4	16.6	25.9	0.0
LOS	C	D	A	D	D	A	C	C	A	B	C	A
Approach Delay		43.0			40.1			18.6			21.1	
Approach LOS		D			D			B			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 31.5

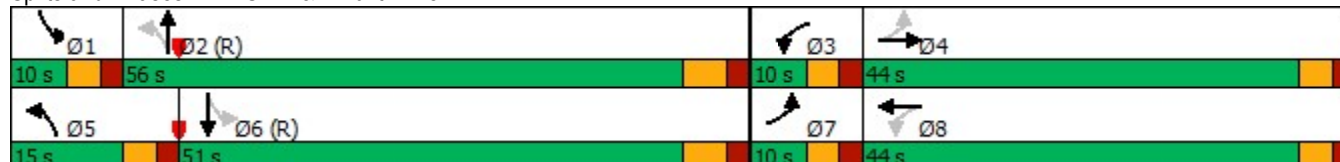
Intersection LOS: C

Intersection Capacity Utilization 74.7%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: SH-2 & E 104th Ave



HCM 6th Signalized Intersection Summary

1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	127	933	131	198	754	62	338	704	411	41	255	49
Future Volume (veh/h)	127	933	131	198	754	62	338	704	411	41	255	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	138	1014	0	215	820	0	367	765	0	45	277	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	398	1104		302	1104		581	1565		319	1384	
Arrive On Green	0.04	0.31	0.00	0.04	0.31	0.00	0.08	0.44	0.00	0.03	0.39	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	138	1014	0	215	820	0	367	765	0	45	277	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.2	33.0	0.0	5.0	24.8	0.0	10.0	18.4	0.0	1.8	6.2	0.0
Cycle Q Clear(g_c), s	3.2	33.0	0.0	5.0	24.8	0.0	10.0	18.4	0.0	1.8	6.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	398	1104		302	1104		581	1565		319	1384	
V/C Ratio(X)	0.35	0.92		0.71	0.74		0.63	0.49		0.14	0.20	
Avail Cap(c_a), veh/h	398	1155		302	1155		581	1565		336	1384	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.1	39.9	0.0	33.0	37.1	0.0	23.0	23.9	0.0	21.3	24.3	0.0
Incr Delay (d2), s/veh	0.5	11.4	0.0	7.6	2.5	0.0	2.2	1.1	0.0	0.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.4	22.0	0.0	4.3	16.1	0.0	5.2	11.8	0.0	1.3	4.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.6	51.3	0.0	40.6	39.6	0.0	25.2	25.0	0.0	21.5	24.6	0.0
LnGrp LOS	C	D		D	D		C	C		C	C	
Approach Vol, veh/h		1152	A		1035	A		1132	A		322	A
Approach Delay, s/veh		48.7			39.8			25.1			24.1	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	58.8	10.0	42.3	15.0	52.7	10.0	42.3				
Change Period (Y+Rc), s	5.0	6.0	5.0	5.0	5.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	5.0	50.0	5.0	39.0	10.0	45.0	5.0	39.0				
Max Q Clear Time (g_c+I1), s	3.8	20.4	7.0	35.0	12.0	8.2	5.2	26.8				
Green Ext Time (p_c), s	0.0	4.9	0.0	2.2	0.0	1.6	0.0	4.1				

Intersection Summary

HCM 6th Ctrl Delay	36.6
HCM 6th LOS	D

Notes

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

Lanes and Geometrics
2: Revere St & E 104th Ave

Turnberry
07/13/2020

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	 	 			 			 			 		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%				0%				0%		0%		
Storage Length (ft)	330		0	375		300	200		0	100		0	
Storage Lanes	2		1	1		1	1		0	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt			0.850				0.850		0.889				0.850
Flt Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	1656	0	1770	1863	1583	
Flt Permitted	0.214			0.079			0.743			0.706			
Satd. Flow (perm)	773	3539	1583	147	3539	1583	1384	1656	0	1315	1863	1583	
Right Turn on Red			Yes				Yes		Yes				Yes
Satd. Flow (RTOR)			136				136		37				95
Link Speed (mph)	30				30				30		30		
Link Distance (ft)	1727				1743				1045		913		
Travel Time (s)	39.3				39.6				23.8		20.8		

Intersection Summary

Area Type: Other

Timings 2: Revere St & E 104th Ave

Turnberry
07/13/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	63	1229	80	59	869	47	56	12	77	20	34
Future Volume (vph)	63	1229	80	59	869	47	56	12	77	20	34
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		Free	8		Free	2		6		6
Detector Phase	7	4		3	8		5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5	9.5	22.5	22.5
Total Split (s)	10.0	70.0		12.0	72.0		11.0	26.0	12.0	27.0	27.0
Total Split (%)	8.3%	58.3%		10.0%	60.0%		9.2%	21.7%	10.0%	22.5%	22.5%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max	None	C-Max	C-Max
Act Effect Green (s)	62.5	58.1	120.0	65.5	59.6	120.0	39.0	32.7	40.6	33.5	33.5
Actuated g/C Ratio	0.52	0.48	1.00	0.55	0.50	1.00	0.32	0.27	0.34	0.28	0.28
v/c Ratio	0.13	0.78	0.05	0.37	0.54	0.03	0.13	0.10	0.18	0.04	0.07
Control Delay	10.2	28.9	0.1	15.6	21.5	0.0	30.5	18.4	30.6	39.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	28.9	0.1	15.6	21.5	0.0	30.5	18.4	30.6	39.3	0.3
LOS	B	C	A	B	C	A	C	B	C	D	A
Approach Delay		26.4			20.1			25.1		24.1	
Approach LOS		C			C			C		C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 23.8

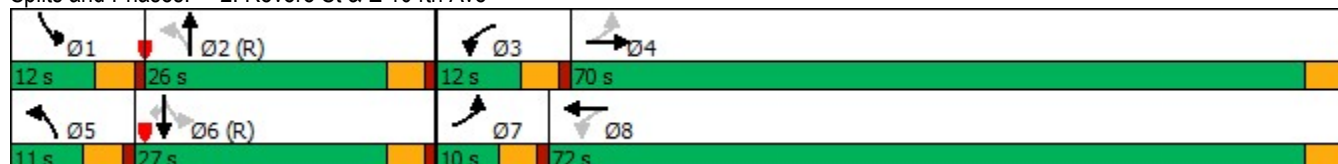
Intersection LOS: C

Intersection Capacity Utilization 60.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Revere St & E 104th Ave



HCM 6th Signalized Intersection Summary

2: Revere St & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 			 			 	
Traffic Volume (veh/h)	63	1229	80	59	869	47	56	12	34	77	20	34
Future Volume (veh/h)	63	1229	80	59	869	47	56	12	34	77	20	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	1336	0	64	945	0	61	13	37	84	22	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	528	1579		170	1577		559	139	395	550	622	527
Arrive On Green	0.04	0.44	0.00	0.04	0.44	0.00	0.04	0.32	0.32	0.05	0.33	0.33
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	1781	429	1221	1781	1870	1585
Grp Volume(v), veh/h	68	1336	0	64	945	0	61	0	50	84	22	37
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1781	0	1651	1781	1870	1585
Q Serve(g_s), s	1.2	40.2	0.0	2.3	24.2	0.0	2.7	0.0	2.5	3.7	1.0	1.9
Cycle Q Clear(g_c), s	1.2	40.2	0.0	2.3	24.2	0.0	2.7	0.0	2.5	3.7	1.0	1.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.74	1.00		1.00
Lane Grp Cap(c), veh/h	528	1579		170	1577		559	0	534	550	622	527
V/C Ratio(X)	0.13	0.85		0.38	0.60		0.11	0.00	0.09	0.15	0.04	0.07
Avail Cap(c_a), veh/h	557	1940		216	1999		591	0	534	581	622	527
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.1	29.7	0.0	24.7	25.3	0.0	25.5	0.0	28.3	25.1	27.0	27.4
Incr Delay (d2), s/veh	0.1	3.1	0.0	1.4	0.4	0.0	0.1	0.0	0.3	0.1	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	24.3	0.0	1.8	15.4	0.0	2.1	0.0	1.9	2.9	0.8	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.2	32.7	0.0	26.1	25.7	0.0	25.5	0.0	28.7	25.2	27.1	27.6
LnGrp LOS	B	C		C	C		C	A	C	C	C	C
Approach Vol, veh/h	1404		A	1009		A	111				143	
Approach Delay, s/veh	32.1			25.7			26.9				26.1	
Approach LOS	C			C			C				C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	43.3	8.9	57.8	8.8	44.4	9.0	57.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.5	21.5	7.5	65.5	6.5	22.5	5.5	67.5				
Max Q Clear Time (g_c+I1), s	5.7	4.5	4.3	42.2	4.7	3.9	3.2	26.2				
Green Ext Time (p_c), s	0.0	0.2	0.0	11.2	0.0	0.1	0.0	8.4				

Intersection Summary

HCM 6th Ctrl Delay 29.1
HCM 6th LOS C

Notes

User approved pedestrian interval to be less than phase max green.

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

Lanes and Geometrics
3: Potomac St & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%			0%		
Storage Length (ft)	575		0	450		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.999			0.978			0.907			0.853		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3536	0	1770	3461	0	1770	1690	0	1770	1589	0
Flt Permitted	0.090			0.096			0.721			0.661		
Satd. Flow (perm)	168	3536	0	179	3461	0	1343	1690	0	1231	1589	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				25			18			54		
Link Speed (mph)	45			45			40			40		
Link Distance (ft)	3949			1321			1965			1374		
Travel Time (s)	59.8			20.0			33.5			23.4		

Intersection Summary

Area Type: Other

Timings 3: Potomac St & E 104th Ave

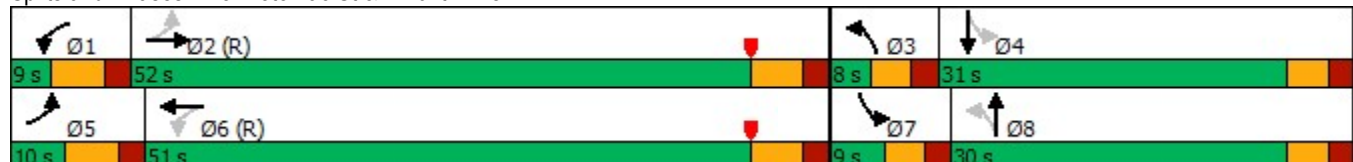
Turnberry
07/13/2020

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	57	1221	10	968	3	10	200	1
Future Volume (vph)	57	1221	10	968	3	10	200	1
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	7	4
Switch Phase								
Minimum Initial (s)	3.0	10.0	3.0	10.0	3.0	5.0	3.0	5.0
Minimum Split (s)	9.0	40.0	9.0	28.0	8.0	30.0	8.0	30.0
Total Split (s)	10.0	52.0	9.0	51.0	8.0	30.0	9.0	31.0
Total Split (%)	10.0%	52.0%	9.0%	51.0%	8.0%	30.0%	9.0%	31.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	Max	None	Max
Act Effect Green (s)	54.0	53.2	49.4	47.0	28.0	25.0	33.2	32.4
Actuated g/C Ratio	0.54	0.53	0.49	0.47	0.28	0.25	0.33	0.32
v/c Ratio	0.40	0.71	0.08	0.75	0.01	0.07	0.50	0.10
Control Delay	18.5	20.8	11.7	25.4	22.0	17.0	31.2	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	20.8	11.7	25.4	22.0	17.0	31.2	8.3
LOS	B	C	B	C	C	B	C	A
Approach Delay		20.7		25.3		17.5		26.6
Approach LOS		C		C		B		C

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 67 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 23.2
Intersection Capacity Utilization 69.2%
Analysis Period (min) 15
Intersection LOS: C
ICU Level of Service C

Splits and Phases: 3: Potomac St & E 104th Ave



HCM 6th Signalized Intersection Summary

3: Potomac St & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (veh/h)	57	1221	5	10	968	164	3	10	17	200	1	50
Future Volume (veh/h)	57	1221	5	10	968	164	3	10	17	200	1	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	62	1327	5	11	1052	178	3	11	18	217	1	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	206	1751	7	162	1394	235	413	160	261	470	8	449
Arrive On Green	0.03	0.48	0.48	0.01	0.46	0.46	0.00	0.25	0.25	0.04	0.29	0.29
Sat Flow, veh/h	1781	3631	14	1781	3041	514	1781	638	1044	1781	29	1561
Grp Volume(v), veh/h	62	649	683	11	614	616	3	0	29	217	0	55
Grp Sat Flow(s),veh/h/ln	1781	1777	1868	1781	1777	1778	1781	0	1682	1781	0	1589
Q Serve(g_s), s	1.8	29.8	29.8	0.3	28.6	28.7	0.1	0.0	1.3	4.0	0.0	2.6
Cycle Q Clear(g_c), s	1.8	29.8	29.8	0.3	28.6	28.7	0.1	0.0	1.3	4.0	0.0	2.6
Prop In Lane	1.00		0.01	1.00		0.29	1.00		0.62	1.00		0.98
Lane Grp Cap(c), veh/h	206	857	901	162	815	815	413	0	421	470	0	457
V/C Ratio(X)	0.30	0.76	0.76	0.07	0.75	0.76	0.01	0.00	0.07	0.46	0.00	0.12
Avail Cap(c_a), veh/h	221	857	901	201	815	815	463	0	421	470	0	457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.3	21.1	21.1	18.2	22.4	22.4	28.0	0.0	28.6	29.5	0.0	26.3
Incr Delay (d2), s/veh	0.8	6.2	5.9	0.2	6.4	6.5	0.0	0.0	0.3	0.7	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	18.3	19.0	0.2	18.0	18.1	0.1	0.0	1.0	4.2	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.1	27.4	27.1	18.4	28.8	28.9	28.0	0.0	28.9	30.3	0.0	26.8
LnGrp LOS	B	C	C	B	C	C	C	A	C	C	A	C
Approach Vol, veh/h	1394			1241			32			272		
Approach Delay, s/veh	26.9			28.8			28.8			29.6		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.8	54.2	5.2	33.8	9.2	51.8	9.0	30.0				
Change Period (Y+Rc), s	6.0	6.0	5.0	5.0	6.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	3.0	46.0	3.0	26.0	4.0	45.0	4.0	25.0				
Max Q Clear Time (g_c+I1), s	2.3	31.8	2.1	4.6	3.8	30.7	6.0	3.3				
Green Ext Time (p_c), s	0.0	7.0	0.0	0.2	0.0	6.5	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay	27.9											
HCM 6th LOS	C											

Lanes and Geometrics
4: Peoria St./Peoria Pkwy & E 96th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%			0%		
Storage Length (ft)	150		250	220		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt					0.994		0.910			0.902		
Flt Protected	0.950			0.950								0.987
Satd. Flow (prot)	1770	1863	1863	1770	1852	0	0	1695	0	0	1658	0
Flt Permitted	0.950			0.950								0.987
Satd. Flow (perm)	1770	1863	1863	1770	1852	0	0	1695	0	0	1658	0
Link Speed (mph)	45				45		40			40		
Link Distance (ft)	1911				4445		904			2821		
Travel Time (s)	29.0				67.3		15.4			48.1		
Intersection Summary												
Area Type:	Other											

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	39	744	0	1	524	22	0	1	2	11	0	29
Future Vol, veh/h	39	744	0	1	524	22	0	1	2	11	0	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	42	809	0	1	570	24	0	1	2	12	0	32

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	594	0	0	809	0	0	1493	1489	809	1479	1477	582
Stage 1	-	-	-	-	-	-	893	893	-	584	584	-
Stage 2	-	-	-	-	-	-	600	596	-	895	893	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	982	-	-	817	-	-	102	124	380	104	126	513
Stage 1	-	-	-	-	-	-	336	360	-	498	498	-
Stage 2	-	-	-	-	-	-	488	492	-	335	360	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	982	-	-	817	-	-	93	119	380	99	120	513
Mov Cap-2 Maneuver	-	-	-	-	-	-	93	119	-	99	120	-
Stage 1	-	-	-	-	-	-	322	345	-	477	498	-
Stage 2	-	-	-	-	-	-	457	492	-	318	345	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	21.6	23.4
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	220	982	-	-	817	-	-	239
HCM Lane V/C Ratio	0.015	0.043	-	-	0.001	-	-	0.182
HCM Control Delay (s)	21.6	8.8	-	-	9.4	-	-	23.4
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.7

Lanes and Geometrics
5: Peoria Pkwy/Revere St & E. 102nd Pl

Turnberry
07/13/2020



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.960				0.959	
Flt Protected	0.966		0.950			
Satd. Flow (prot)	1727	0	1770	1863	1786	0
Flt Permitted	0.966		0.950			
Satd. Flow (perm)	1727	0	1770	1863	1786	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	820			646	1243	
Travel Time (s)	18.6			14.7	28.3	

Intersection Summary

Area Type: Other

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	24	10	17	55	95	41
Future Vol, veh/h	24	10	17	55	95	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	11	18	60	103	45

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	222	126	148
Stage 1	126	-	-
Stage 2	96	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	766	924	1434
Stage 1	900	-	-
Stage 2	928	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	756	924	1434
Mov Cap-2 Maneuver	756	-	-
Stage 1	888	-	-
Stage 2	928	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	1.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1434	-	799	-	-
HCM Lane V/C Ratio	0.013	-	0.046	-	-
HCM Control Delay (s)	7.5	-	9.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lanes and Geometrics
6: Peoria Pkwy & Quentin St.

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt		0.961			0.912			0.977			0.985	
Flt Protected		0.966			0.983		0.950			0.950		
Satd. Flow (prot)	0	1729	0	0	1670	0	1770	1820	0	1770	1835	0
Flt Permitted		0.966			0.983		0.950			0.950		
Satd. Flow (perm)	0	1729	0	0	1670	0	1770	1820	0	1770	1835	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		548			833			463			646	
Travel Time (s)		12.5			18.9			10.5			14.7	
Intersection Summary												
Area Type:	Other											

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	0	2	6	0	12	4	56	10	21	76	8
Future Vol, veh/h	5	0	2	6	0	12	4	56	10	21	76	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	2	7	0	13	4	61	11	23	83	9
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	215	214	88	210	213	67	92	0	0	72	0	0
Stage 1	134	134	-	75	75	-	-	-	-	-	-	-
Stage 2	81	80	-	135	138	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	742	684	970	747	684	997	1503	-	-	1528	-	-
Stage 1	869	785	-	934	833	-	-	-	-	-	-	-
Stage 2	927	828	-	868	782	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	723	672	970	735	672	997	1503	-	-	1528	-	-
Mov Cap-2 Maneuver	723	672	-	735	672	-	-	-	-	-	-	-
Stage 1	866	773	-	931	831	-	-	-	-	-	-	-
Stage 2	912	826	-	853	770	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	9.7		9.1		0.4		1.5					
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1503	-	-	780	891	1528	-	-				
HCM Lane V/C Ratio	0.003	-	-	0.01	0.022	0.015	-	-				
HCM Control Delay (s)	7.4	-	-	9.7	9.1	7.4	-	-				
HCM Lane LOS	A	-	-	A	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-				

Lanes and Geometrics
7: Peoria Pkwy & E. 101st Ave/E. 101st Ave.

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%		0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt	0.961				0.896		0.974				0.891	
Flt Protected	0.966				0.989		0.950				0.950	
Satd. Flow (prot)	0	1729	0	0	1651	0	1770	1814	0	1770	1660	0
Flt Permitted	0.966				0.989		0.950				0.950	
Satd. Flow (perm)	0	1729	0	0	1651	0	1770	1814	0	1770	1660	0
Link Speed (mph)	30				30		30				30	
Link Distance (ft)	741				863		2821				463	
Travel Time (s)	16.8				19.6		64.1				10.5	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	29	0	12	3	0	9	21	31	6	15	18	50
Future Vol, veh/h	29	0	12	3	0	9	21	31	6	15	18	50
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	32	0	13	3	0	10	23	34	7	16	20	54

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	168	166	47	170	190	38	74	0	0	41	0	0
Stage 1	79	79	-	84	84	-	-	-	-	-	-	-
Stage 2	89	87	-	86	106	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	796	727	1022	794	705	1034	1526	-	-	1568	-	-
Stage 1	930	829	-	924	825	-	-	-	-	-	-	-
Stage 2	918	823	-	922	807	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	774	709	1022	769	687	1034	1526	-	-	1568	-	-
Mov Cap-2 Maneuver	774	709	-	769	687	-	-	-	-	-	-	-
Stage 1	916	821	-	910	813	-	-	-	-	-	-	-
Stage 2	896	811	-	901	799	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.6		8.8		2.7		1.3	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1526	-	-	833 952	1568	-	-
HCM Lane V/C Ratio	0.015	-	-	0.053 0.014	0.01	-	-
HCM Control Delay (s)	7.4	-	-	9.6 8.8	7.3	-	-
HCM Lane LOS	A	-	-	A A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2 0	0	-	-

Lanes and Geometrics
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%		0%		0%		0%		0%		0%		
Storage Length (ft)	500		880	450		300	700		500	800		500	
Storage Lanes	2		1	2		1	1		1	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Ped Bike Factor													
Frt			0.850				0.850		0.850				0.850
Flt Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583	
Flt Permitted	0.133			0.114			0.089			0.391			
Satd. Flow (perm)	481	3539	1583	412	3539	1583	166	3539	1583	728	3539	1583	
Right Turn on Red			Yes				Yes		Yes				Yes
Satd. Flow (RTOR)			257				209		249				209
Link Speed (mph)	45				45				55		55		
Link Distance (ft)	1177				1609				1840		1644		
Travel Time (s)	17.8				24.4				22.8		20.4		

Intersection Summary

Area Type: Other

Timings
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	886	424	722	1261	86	186	492	229	41	1156	158
Future Volume (vph)	139	886	424	722	1261	86	186	492	229	41	1156	158
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	10.0	35.0		10.0	35.0		11.0	48.0		10.0	48.0	
Total Split (s)	10.0	35.0		25.0	50.0		11.0	50.0		10.0	49.0	
Total Split (%)	8.3%	29.2%		20.8%	41.7%		9.2%	41.7%		8.3%	40.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	35.0	30.0	120.0	55.0	45.0	120.0	51.8	46.0	120.0	49.0	43.0	120.0
Actuated g/C Ratio	0.29	0.25	1.00	0.46	0.38	1.00	0.43	0.38	1.00	0.41	0.36	1.00
v/c Ratio	0.57	1.09	0.29	1.13	1.03	0.06	1.34	0.39	0.16	0.13	0.99	0.11
Control Delay	30.0	100.0	0.5	115.0	59.2	0.0	213.0	28.5	0.2	19.2	61.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	100.0	0.5	115.0	59.2	0.0	213.0	28.5	0.2	19.2	61.9	0.1
LOS	C	F	A	F	E	A	F	C	A	B	E	A
Approach Delay		64.2			76.2			59.2			53.4	
Approach LOS		E			E			E			D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.34

Intersection Signal Delay: 65.2

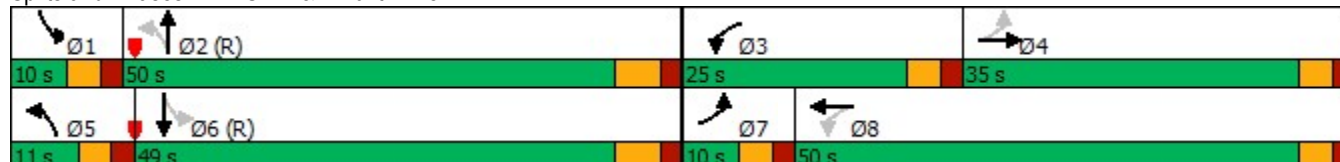
Intersection LOS: E

Intersection Capacity Utilization 104.8%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 1: SH-2 & E 104th Ave



HCM 6th Signalized Intersection Summary

1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	886	424	722	1261	86	186	492	229	41	1156	158
Future Volume (veh/h)	139	886	424	722	1261	86	186	492	229	41	1156	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	151	963	0	785	1371	0	202	535	0	45	1257	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	264	888		696	1333		152	1336		348	1273	
Arrive On Green	0.04	0.25	0.00	0.33	0.75	0.00	0.05	0.38	0.00	0.03	0.36	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	151	963	0	785	1371	0	202	535	0	45	1257	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.9	30.0	0.0	20.0	45.0	0.0	6.0	13.3	0.0	1.9	42.1	0.0
Cycle Q Clear(g_c), s	3.9	30.0	0.0	20.0	45.0	0.0	6.0	13.3	0.0	1.9	42.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	888		696	1333		152	1336		348	1273	
V/C Ratio(X)	0.57	1.08		1.13	1.03		1.33	0.40		0.13	0.99	
Avail Cap(c_a), veh/h	264	888		696	1333		152	1336		365	1273	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.54	0.54	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.2	45.0	0.0	26.6	15.0	0.0	33.1	27.5	0.0	23.4	38.2	0.0
Incr Delay (d2), s/veh	3.0	55.6	0.0	68.0	26.0	0.0	185.3	0.9	0.0	0.2	22.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.0	28.1	0.0	16.7	14.3	0.0	17.0	9.3	0.0	1.4	28.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.2	100.6	0.0	94.6	41.0	0.0	218.4	28.4	0.0	23.6	60.6	0.0
LnGrp LOS	D	F		F	F		F	C		C	E	
Approach Vol, veh/h		1114	A		2156	A		737	A		1302	A
Approach Delay, s/veh		92.1			60.5			80.5			59.3	
Approach LOS		F			E			F			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	51.1	25.0	35.0	11.0	49.0	10.0	50.0				
Change Period (Y+Rc), s	5.0	6.0	5.0	5.0	5.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	5.0	44.0	20.0	30.0	6.0	43.0	5.0	45.0				
Max Q Clear Time (g_c+I1), s	3.9	15.3	22.0	32.0	8.0	44.1	5.9	47.0				
Green Ext Time (p_c), s	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			69.6									
HCM 6th LOS			E									
Notes												
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Lanes and Geometrics
2: Revere St. & E. 104th Ave

Turnberry
07/13/2020

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	 	 			 			 			 		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%				0%				0%		0%		
Storage Length (ft)	330		0	375		0	200		0	100		0	
Storage Lanes	2		1	1		1	1		0	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt			0.850				0.850		0.901				0.850
Flt Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	1678	0	1770	1863	1583	
Flt Permitted	0.064			0.158			0.724			0.628			
Satd. Flow (perm)	231	3539	1583	294	3539	1583	1349	1678	0	1170	1863	1583	
Right Turn on Red			Yes				Yes		Yes				Yes
Satd. Flow (RTOR)			136				136		74				110
Link Speed (mph)	30				30				30		30		
Link Distance (ft)	254				309				225		201		
Travel Time (s)	5.8				7.0				5.1		4.6		

Intersection Summary

Area Type: Other

Timings
2: Revere St. & E. 104th Ave

Turnberry
07/13/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	41	1032	62	45	1651	75	160	40	111	15	101
Future Volume (vph)	41	1032	62	45	1651	75	160	40	111	15	101
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		Free	8		Free	2		6		6
Detector Phase	7	4		3	8		5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5	9.5	22.5	22.5
Total Split (s)	11.0	64.6		14.0	67.6		12.0	30.0	11.4	29.4	29.4
Total Split (%)	9.2%	53.8%		11.7%	56.3%		10.0%	25.0%	9.5%	24.5%	24.5%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max	None	C-Max	C-Max
Act Effect Green (s)	67.9	62.9	120.0	69.1	63.5	120.0	35.2	27.4	33.5	26.6	26.6
Actuated g/C Ratio	0.57	0.52	1.00	0.58	0.53	1.00	0.29	0.23	0.28	0.22	0.22
v/c Ratio	0.15	0.61	0.04	0.19	0.96	0.05	0.41	0.29	0.34	0.04	0.25
Control Delay	10.2	21.8	0.0	10.9	40.8	0.1	35.9	19.8	34.2	38.5	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	21.8	0.0	10.9	40.8	0.1	35.9	19.8	34.2	38.5	8.8
LOS	B	C	A	B	D	A	D	B	C	D	A
Approach Delay		20.2			38.3			29.1		23.2	
Approach LOS		C			D			C		C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 30.5

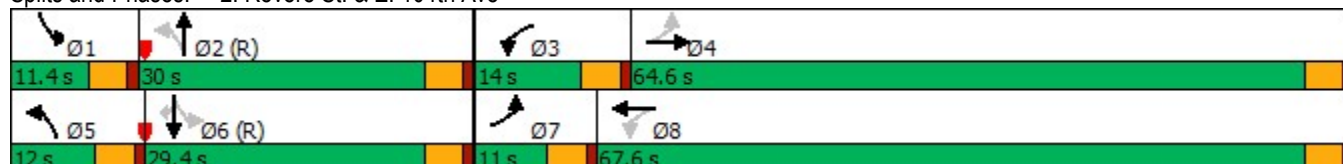
Intersection LOS: C

Intersection Capacity Utilization 72.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Revere St. & E. 104th Ave



HCM 6th Signalized Intersection Summary

2: Revere St. & E. 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	1032	62	45	1651	75	160	40	77	111	15	101
Future Volume (veh/h)	41	1032	62	45	1651	75	160	40	77	111	15	101
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	45	1122	0	49	1795	0	174	43	84	121	16	110
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	251	1855		271	1859		456	134	262	382	434	368
Arrive On Green	0.03	0.52	0.00	0.03	0.52	0.00	0.06	0.24	0.24	0.06	0.23	0.23
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	1781	566	1105	1781	1870	1585
Grp Volume(v), veh/h	45	1122	0	49	1795	0	174	0	127	121	16	110
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1781	0	1671	1781	1870	1585
Q Serve(g_s), s	0.7	26.5	0.0	1.5	58.4	0.0	7.5	0.0	7.5	6.2	0.8	6.9
Cycle Q Clear(g_c), s	0.7	26.5	0.0	1.5	58.4	0.0	7.5	0.0	7.5	6.2	0.8	6.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.66	1.00		1.00
Lane Grp Cap(c), veh/h	251	1855		271	1859		456	0	396	382	434	368
V/C Ratio(X)	0.18	0.60		0.18	0.97		0.38	0.00	0.32	0.32	0.04	0.30
Avail Cap(c_a), veh/h	326	1855		352	1869		456	0	396	382	434	368
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.5	20.0	0.0	15.4	27.6	0.0	33.3	0.0	37.8	32.7	35.7	38.0
Incr Delay (d2), s/veh	0.3	0.6	0.0	0.3	13.5	0.0	0.5	0.0	2.1	0.5	0.2	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	16.2	0.0	1.1	35.6	0.0	7.4	0.0	6.0	4.9	0.7	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	20.6	0.0	15.7	41.1	0.0	33.8	0.0	39.9	33.2	35.9	40.1
LnGrp LOS	C	C		B	D		C	A	D	C	D	D
Approach Vol, veh/h	1167		A	1844		A	301		247			
Approach Delay, s/veh	20.9			40.4			36.4		36.5			
Approach LOS	C			D			D		D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.4	32.9	8.5	67.1	12.0	32.3	8.4	67.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.9	25.5	9.5	60.1	7.5	24.9	6.5	63.1				
Max Q Clear Time (g_c+I1), s	8.2	9.5	3.5	28.5	9.5	8.9	2.7	60.4				
Green Ext Time (p_c), s	0.0	0.6	0.0	10.1	0.0	0.3	0.0	2.4				

Intersection Summary

HCM 6th Ctrl Delay	33.4
HCM 6th LOS	C

Notes

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

Lanes and Geometrics
3: Potomac St & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%			0%		
Storage Length (ft)	575		0	450		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.976				0.910		0.856	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	0	1770	3454	0	1770	1695	0	1770	1595	0
Flt Permitted	0.096			0.104			0.690			0.640		
Satd. Flow (perm)	179	3539	0	194	3454	0	1285	1695	0	1192	1595	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					28				39		100	
Link Speed (mph)	45				45		40		40		40	
Link Distance (ft)	3949				1321		1965		1374			
Travel Time (s)	59.8				20.0		33.5		23.4			

Intersection Summary

Area Type: Other

Timings 3: Potomac St & E 104th Ave

Turnberry
07/13/2020

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	51	1073	28	1818	15	24	351	4
Future Volume (vph)	51	1073	28	1818	15	24	351	4
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	7	4
Switch Phase								
Minimum Initial (s)	3.0	10.0	3.0	10.0	3.0	5.0	3.0	5.0
Minimum Split (s)	9.0	40.0	9.0	28.0	8.0	30.0	8.0	30.0
Total Split (s)	10.0	49.0	10.0	49.0	9.0	31.0	10.0	32.0
Total Split (%)	10.0%	49.0%	10.0%	49.0%	9.0%	31.0%	10.0%	32.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	Max	None	Max
Act Effect Green (s)	49.4	47.0	48.2	45.0	30.0	26.0	34.4	32.4
Actuated g/C Ratio	0.49	0.47	0.48	0.45	0.30	0.26	0.34	0.32
v/c Ratio	0.36	0.70	0.19	1.50	0.04	0.14	0.87	0.18
Control Delay	18.5	24.7	14.3	255.3	21.3	15.2	52.1	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	24.7	14.3	255.3	21.3	15.2	52.1	7.2
LOS	B	C	B	F	C	B	D	A
Approach Delay		24.4		252.3		16.4		42.5
Approach LOS		C		F		B		D

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 67 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.50

Intersection Signal Delay: 156.7

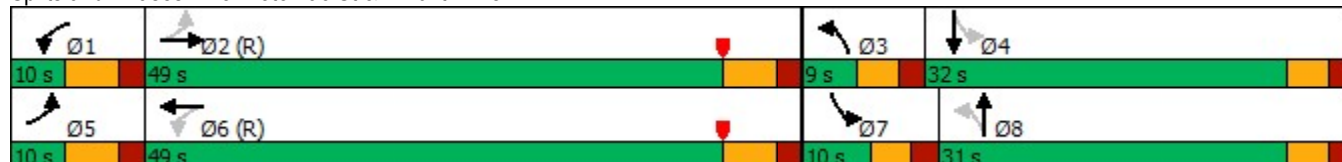
Intersection LOS: F

Intersection Capacity Utilization 96.8%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 3: Potomac St & E 104th Ave



HCM 6th Signalized Intersection Summary

3: Potomac St & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (veh/h)	51	1073	0	28	1818	353	15	24	36	351	4	92
Future Volume (veh/h)	51	1073	0	28	1818	353	15	24	36	351	4	92
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	55	1166	0	30	1976	384	16	26	39	382	4	100
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	123	1610	0	192	1317	248	414	176	263	469	18	459
Arrive On Green	0.03	0.45	0.00	0.02	0.44	0.44	0.01	0.26	0.26	0.05	0.30	0.30
Sat Flow, veh/h	1781	3647	0	1781	2985	561	1781	675	1013	1781	61	1533
Grp Volume(v), veh/h	55	1166	0	30	1150	1210	16	0	65	382	0	104
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1769	1781	0	1688	1781	0	1594
Q Serve(g_s), s	1.7	26.7	0.0	0.9	44.1	44.1	0.7	0.0	3.0	5.0	0.0	4.9
Cycle Q Clear(g_c), s	1.7	26.7	0.0	0.9	44.1	44.1	0.7	0.0	3.0	5.0	0.0	4.9
Prop In Lane	1.00		0.00	1.00		0.32	1.00		0.60	1.00		0.96
Lane Grp Cap(c), veh/h	123	1610	0	192	784	780	414	0	439	469	0	477
V/C Ratio(X)	0.45	0.72	0.00	0.16	1.47	1.55	0.04	0.00	0.15	0.81	0.00	0.22
Avail Cap(c_a), veh/h	143	1610	0	233	784	780	466	0	439	469	0	477
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.2	22.3	0.0	18.4	27.9	27.9	26.8	0.0	28.5	33.9	0.0	26.3
Incr Delay (d2), s/veh	2.1	2.4	0.0	0.4	217.1	254.2	0.0	0.0	0.7	10.6	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	15.4	0.0	0.7	97.2	110.4	0.5	0.0	2.2	12.1	0.0	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.3	24.6	0.0	18.8	245.1	282.1	26.9	0.0	29.2	44.5	0.0	27.3
LnGrp LOS	C	C	A	B	F	F	C	A	C	D	A	C
Approach Vol, veh/h	1221		2390				81			486		
Approach Delay, s/veh	24.7		261.0				28.7			40.8		
Approach LOS	C		F				C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.7	51.3	6.1	34.9	8.9	50.1	10.0	31.0				
Change Period (Y+Rc), s	6.0	6.0	5.0	5.0	6.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	4.0	43.0	4.0	27.0	4.0	43.0	5.0	26.0				
Max Q Clear Time (g_c+I1), s	2.9	28.7	2.7	6.9	3.7	46.1	7.0	5.0				
Green Ext Time (p_c), s	0.0	6.6	0.0	0.5	0.0	0.0	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay	161.8											
HCM 6th LOS	F											

Lanes and Geometrics
4: Peoria St/Revere St & E 96th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%			0%		
Storage Length (ft)	150		250	220		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt				0.998						0.909		
Flt Protected	0.950			0.950							0.984	
Satd. Flow (prot)	1770	1863	1863	1770	1859	0	0	1863	0	0	1666	0
Flt Permitted	0.950			0.950							0.984	
Satd. Flow (perm)	1770	1863	1863	1770	1859	0	0	1863	0	0	1666	0
Link Speed (mph)	45			45			40			40		
Link Distance (ft)	1911			4445			904			2404		
Travel Time (s)	29.0			67.3			15.4			41.0		

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	23.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	640	0	2	1222	15	0	0	0	38	0	77
Future Vol, veh/h	26	640	0	2	1222	15	0	0	0	38	0	77
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	28	696	0	2	1328	16	0	0	0	41	0	84
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1344	0	0	696	0	0	2134	2100	696	2092	2092	1336
Stage 1	-	-	-	-	-	-	752	752	-	1340	1340	-
Stage 2	-	-	-	-	-	-	1382	1348	-	752	752	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	513	-	-	900	-	-	36	52	442	~ 38	52	188
Stage 1	-	-	-	-	-	-	402	418	-	188	221	-
Stage 2	-	-	-	-	-	-	178	219	-	402	418	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	513	-	-	900	-	-	19	49	442	~ 36	49	188
Mov Cap-2 Maneuver	-	-	-	-	-	-	19	49	-	~ 36	49	-
Stage 1	-	-	-	-	-	-	380	395	-	178	221	-
Stage 2	-	-	-	-	-	-	99	219	-	380	395	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0			0			\$ 414		
HCM LOS							A			F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	513	-	-	900	-	-	78				
HCM Lane V/C Ratio	-	0.055	-	-	0.002	-	-	1.603				
HCM Control Delay (s)	0	12.4	-	-	9	-	-	\$ 414				
HCM Lane LOS	A	B	-	-	A	-	-	F				
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	10.4				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s				+: Computation Not Defined				*: All major volume in platoon		

Lanes and Geometrics
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%		0%		0%		0%		0%		0%		
Storage Length (ft)	500		880	450		300	700		500	800		500	
Storage Lanes	2		1	2		1	1		1	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Ped Bike Factor													
Frt			0.850				0.850		0.850				0.850
Flt Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583	
Flt Permitted	0.098			0.098			0.344			0.091			
Satd. Flow (perm)	354	3539	1583	354	3539	1583	641	3539	1583	170	3539	1583	
Right Turn on Red			Yes				Yes		Yes				Yes
Satd. Flow (RTOR)			265				164		523				164
Link Speed (mph)	45				45				55		55		
Link Distance (ft)	1177				1609				1840		1644		
Travel Time (s)	17.8				24.4				22.8		20.4		

Intersection Summary

Area Type: Other

Timings
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	238	1646	244	343	1351	111	629	1312	724	69	475	92
Future Volume (vph)	238	1646	244	343	1351	111	629	1312	724	69	475	92
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	10.0	35.0		10.0	35.0		11.0	48.0		10.0	48.0	
Total Split (s)	10.0	46.0		10.0	46.0		14.0	54.0		10.0	50.0	
Total Split (%)	8.3%	38.3%		8.3%	38.3%		11.7%	45.0%		8.3%	41.7%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	46.0	41.0	120.0	46.0	41.0	120.0	58.2	50.0	120.0	50.0	44.0	120.0
Actuated g/C Ratio	0.38	0.34	1.00	0.38	0.34	1.00	0.48	0.42	1.00	0.42	0.37	1.00
v/c Ratio	0.98	1.48	0.17	1.42	1.21	0.08	1.73	0.97	0.50	0.55	0.40	0.06
Control Delay	79.2	251.5	0.2	235.0	130.8	0.1	362.8	51.9	1.1	32.4	29.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.2	251.5	0.2	235.0	130.8	0.1	362.8	51.9	1.1	32.4	29.3	0.1
LOS	E	F	A	F	F	A	F	D	A	C	C	A
Approach Delay		203.5			142.6			111.5			25.4	
Approach LOS		F			F			F			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.73

Intersection Signal Delay: 138.7

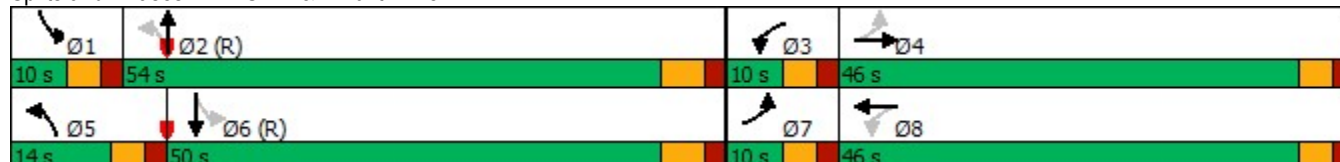
Intersection LOS: F

Intersection Capacity Utilization 120.8%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 1: SH-2 & E 104th Ave



HCM 6th Signalized Intersection Summary

1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	238	1646	244	343	1351	111	629	1312	724	69	475	92
Future Volume (veh/h)	238	1646	244	343	1351	111	629	1312	724	69	475	92
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	259	1789	0	373	1468	0	684	1426	0	75	516	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	264	1214		264	1214		423	1430		131	1303	
Arrive On Green	0.04	0.34	0.00	0.08	0.68	0.00	0.08	0.40	0.00	0.04	0.37	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	259	1789	0	373	1468	0	684	1426	0	75	516	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.0	41.0	0.0	5.0	41.0	0.0	9.0	48.1	0.0	3.1	12.9	0.0
Cycle Q Clear(g_c), s	5.0	41.0	0.0	5.0	41.0	0.0	9.0	48.1	0.0	3.1	12.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	1214		264	1214		423	1430		131	1303	
V/C Ratio(X)	0.98	1.47		1.41	1.21		1.62	1.00		0.57	0.40	
Avail Cap(c_a), veh/h	264	1214		264	1214		423	1430		135	1303	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.67	0.67	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.8	39.5	0.0	35.6	19.0	0.0	35.8	35.8	0.0	30.2	28.2	0.0
Incr Delay (d2), s/veh	50.0	217.6	0.0	200.3	99.5	0.0	288.6	23.1	0.0	5.5	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.6	81.2	0.0	15.1	33.6	0.0	61.0	31.5	0.0	2.6	9.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.8	257.1	0.0	235.9	118.5	0.0	324.5	58.9	0.0	35.7	29.1	0.0
LnGrp LOS	F	F		F	F		F	E		D	C	
Approach Vol, veh/h		2048	A		1841	A		2110	A		591	A
Approach Delay, s/veh		235.4			142.3			145.0			29.9	
Approach LOS		F			F			F			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.7	54.3	10.0	46.0	14.0	50.0	10.0	46.0				
Change Period (Y+Rc), s	5.0	6.0	5.0	5.0	5.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	5.0	48.0	5.0	41.0	9.0	44.0	5.0	41.0				
Max Q Clear Time (g_c+I1), s	5.1	50.1	7.0	43.0	11.0	14.9	7.0	43.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	162.0
HCM 6th LOS	F

Notes

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

Lanes and Geometrics
2: Revere St & E 104th Ave

Turnberry
07/13/2020

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%		0%		0%		0%		0%		0%		
Storage Length (ft)	330		0	375		300	200		0	100		0	
Storage Lanes	2		1	1		1	1		0	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt			0.850				0.850		0.891				0.850
Flt Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	1660	0	1770	1863	1583	
Flt Permitted	0.086			0.055			0.725			0.618			
Satd. Flow (perm)	311	3539	1583	102	3539	1583	1350	1660	0	1151	1863	1583	
Right Turn on Red			Yes				Yes		Yes				Yes
Satd. Flow (RTOR)			136				136		77				95
Link Speed (mph)	45				45				30		30		
Link Distance (ft)	1609				3949				939		852		
Travel Time (s)	24.4				59.8				21.3		19.4		

Intersection Summary

Area Type: Other

Timings 2: Revere St & E 104th Ave

Turnberry
07/13/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	 	 			 						
Traffic Volume (vph)	118	2049	177	122	1435	88	121	27	143	45	64
Future Volume (vph)	118	2049	177	122	1435	88	121	27	143	45	64
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		Free	8		Free	2		6		6
Detector Phase	7	4		3	8		5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5	9.5	22.5	22.5
Total Split (s)	10.0	77.2		10.4	77.6		9.6	22.8	9.6	22.8	22.8
Total Split (%)	8.3%	64.3%		8.7%	64.7%		8.0%	19.0%	8.0%	19.0%	19.0%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max	None	C-Max	C-Max
Act Effect Green (s)	78.2	72.7	120.0	79.0	73.1	120.0	23.4	18.3	23.4	18.3	18.3
Actuated g/C Ratio	0.65	0.61	1.00	0.66	0.61	1.00	0.20	0.15	0.20	0.15	0.15
v/c Ratio	0.37	1.00	0.12	0.89	0.72	0.06	0.47	0.33	0.62	0.17	0.22
Control Delay	14.5	40.1	0.0	74.3	18.9	0.1	46.2	19.0	53.2	46.1	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	40.1	0.0	74.3	18.9	0.1	46.2	19.0	53.2	46.1	5.8
LOS	B	D	A	E	B	A	D	B	D	D	A
Approach Delay		35.6			22.0			34.1		39.8	
Approach LOS		D			C			C		D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 30.6

Intersection LOS: C

Intersection Capacity Utilization 89.2%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 2: Revere St & E 104th Ave

							
Ø1	Ø2 (R)		Ø3	Ø4		Ø5	Ø6 (R)
9.6 s	22.8 s		10.4 s	77.2 s		9.6 s	22.8 s
							
Ø7	Ø8						
10 s	77.6 s						

HCM 6th Signalized Intersection Summary

2: Revere St & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	2049	177	122	1435	88	121	27	71	143	45	64
Future Volume (veh/h)	118	2049	177	122	1435	88	121	27	71	143	45	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	128	2134	0	133	1560	0	132	29	77	155	49	70
Peak Hour Factor	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	462	2153		150	2182		301	69	183	257	285	242
Arrive On Green	0.04	0.61	0.00	0.05	0.61	0.00	0.04	0.15	0.15	0.04	0.15	0.15
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	1781	453	1202	1781	1870	1585
Grp Volume(v), veh/h	128	2134	0	133	1560	0	132	0	106	155	49	70
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1781	0	1654	1781	1870	1585
Q Serve(g_s), s	1.6	71.1	0.0	4.7	36.3	0.0	5.1	0.0	7.0	5.1	2.7	4.7
Cycle Q Clear(g_c), s	1.6	71.1	0.0	4.7	36.3	0.0	5.1	0.0	7.0	5.1	2.7	4.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.73	1.00		1.00
Lane Grp Cap(c), veh/h	462	2153		150	2182		301	0	252	257	285	242
V/C Ratio(X)	0.28	0.99		0.89	0.72		0.44	0.00	0.42	0.60	0.17	0.29
Avail Cap(c_a), veh/h	478	2153		150	2182		301	0	252	257	285	242
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.00	0.09	0.09	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.2	23.3	0.0	35.9	15.9	0.0	43.0	0.0	46.0	46.0	44.3	45.1
Incr Delay (d2), s/veh	0.0	4.1	0.0	6.2	0.1	0.0	1.0	0.0	5.1	3.9	1.3	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	29.4	0.0	5.1	14.8	0.0	2.0	0.0	5.8	4.0	2.5	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	27.4	0.0	42.0	16.0	0.0	44.0	0.0	51.1	49.9	45.6	48.1
LnGrp LOS	B	C		D	B		D	A	D	D	D	D
Approach Vol, veh/h	2262		A	1693		A	238		274			
Approach Delay, s/veh	26.7			18.1			47.2		48.7			
Approach LOS	C			B			D		D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	22.8	10.4	77.2	9.6	22.8	9.4	78.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	18.3	5.9	72.7	5.1	18.3	5.5	73.1				
Max Q Clear Time (g_c+I1), s	7.1	9.0	6.7	73.1	7.1	6.7	3.6	38.3				
Green Ext Time (p_c), s	0.0	0.3	0.0	0.0	0.0	0.3	0.1	14.8				

Intersection Summary

HCM 6th Ctrl Delay 25.9
HCM 6th LOS C

Notes

User approved pedestrian interval to be less than phase max green.

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

Lanes and Geometrics
3: Potomac St & E 104th Ave

Turnberry
07/13/2020

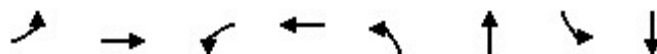
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%			0%		
Storage Length (ft)	575		0	450		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.999			0.977			0.906			0.853		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3536	0	1770	3458	0	1770	1688	0	1770	1589	0
Flt Permitted	0.096			0.103			0.692			0.615		
Satd. Flow (perm)	179	3536	0	192	3458	0	1289	1688	0	1146	1589	0
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)	1			25			35			98		
Link Speed (mph)	45			45			40			40		
Link Distance (ft)	3949			1321			1965			1374		
Travel Time (s)	59.8			20.0			33.5			23.4		

Intersection Summary

Area Type: Other

Timings 3: Potomac St & E 104th Ave

Turnberry
07/13/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	↑↑	←	↑↑	←	↑	←	↑
Traffic Volume (vph)	105	2237	19	1736	6	19	373	2
Future Volume (vph)	105	2237	19	1736	6	19	373	2
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	7	4
Switch Phase								
Minimum Initial (s)	3.0	10.0	3.0	10.0	3.0	5.0	3.0	5.0
Minimum Split (s)	9.0	40.0	9.0	28.0	8.0	30.0	8.0	30.0
Total Split (s)	10.0	50.0	9.0	49.0	8.0	30.0	11.0	33.0
Total Split (%)	10.0%	50.0%	9.0%	49.0%	8.0%	30.0%	11.0%	33.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	Max	None	Max
Act Effect Green (s)	51.0	49.4	46.0	43.0	28.0	25.0	35.6	34.4
Actuated g/C Ratio	0.51	0.49	0.46	0.43	0.28	0.25	0.36	0.34
v/c Ratio	0.74	1.40	0.16	1.48	0.02	0.12	0.91	0.16
Control Delay	43.7	207.7	14.1	245.1	21.2	15.6	56.3	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.7	207.7	14.1	245.1	21.2	15.6	56.3	6.4
LOS	D	F	B	F	C	B	E	A
Approach Delay		200.4		243.0		16.2		46.4
Approach LOS		F		F		B		D

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 67 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.48

Intersection Signal Delay: 201.5

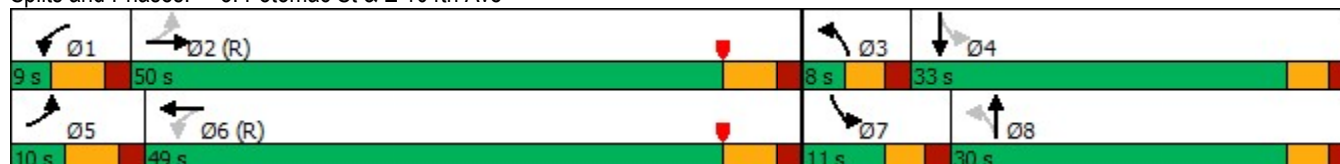
Intersection LOS: F

Intersection Capacity Utilization 107.0%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 3: Potomac St & E 104th Ave



HCM 6th Signalized Intersection Summary

3: Potomac St & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (veh/h)	105	2237	9	19	1736	306	6	19	32	373	2	90
Future Volume (veh/h)	105	2237	9	19	1736	306	6	19	32	373	2	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	2432	10	21	1887	333	7	21	35	405	2	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	143	1658	7	96	1305	223	405	158	263	481	10	475
Arrive On Green	0.04	0.46	0.46	0.01	0.43	0.43	0.01	0.25	0.25	0.06	0.30	0.30
Sat Flow, veh/h	1781	3630	15	1781	3034	520	1781	630	1051	1781	32	1558
Grp Volume(v), veh/h	114	1190	1252	21	1082	1138	7	0	56	405	0	100
Grp Sat Flow(s),veh/h/ln	1781	1777	1868	1781	1777	1777	1781	0	1681	1781	0	1590
Q Serve(g_s), s	3.6	45.7	45.7	0.7	43.0	43.0	0.3	0.0	2.6	6.0	0.0	4.7
Cycle Q Clear(g_c), s	3.6	45.7	45.7	0.7	43.0	43.0	0.3	0.0	2.6	6.0	0.0	4.7
Prop In Lane	1.00		0.01	1.00		0.29	1.00		0.63	1.00		0.98
Lane Grp Cap(c), veh/h	143	812	853	96	764	764	405	0	420	481	0	484
V/C Ratio(X)	0.80	1.47	1.47	0.22	1.42	1.49	0.02	0.00	0.13	0.84	0.00	0.21
Avail Cap(c_a), veh/h	143	812	853	125	764	764	449	0	420	481	0	484
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.16	0.16	0.16	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.3	27.2	27.2	24.9	28.5	28.5	27.8	0.0	29.1	33.7	0.0	25.8
Incr Delay (d2), s/veh	5.0	210.8	211.7	1.1	194.7	227.5	0.0	0.0	0.7	12.7	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.4	90.5	95.3	0.5	86.9	98.6	0.2	0.0	2.0	12.6	0.0	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.3	237.9	238.8	26.1	223.2	256.0	27.9	0.0	29.8	46.5	0.0	26.8
LnGrp LOS	C	F	F	C	F	F	C	A	C	D	A	C
Approach Vol, veh/h	2556			2241			63			505		
Approach Delay, s/veh	229.1			238.0			29.5			42.6		
Approach LOS	F			F			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.3	51.7	5.5	35.5	10.0	49.0	11.0	30.0				
Change Period (Y+Rc), s	6.0	6.0	5.0	5.0	6.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	3.0	44.0	3.0	28.0	4.0	43.0	6.0	25.0				
Max Q Clear Time (g_c+I1), s	2.7	47.7	2.3	6.7	5.6	45.0	8.0	4.6				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay	212.9											
HCM 6th LOS	F											

Lanes and Geometrics
4: Peoria St/Revere St & E 96th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%		0%		0%		0%		0%		0%	
Storage Length (ft)	150		250	220		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt					0.992				0.910		0.904	
Flt Protected	0.950			0.950							0.986	
Satd. Flow (prot)	1770	1863	1863	1770	1848	0	0	1695	0	0	1660	0
Flt Permitted	0.950			0.950							0.986	
Satd. Flow (perm)	1770	1863	1863	1770	1848	0	0	1695	0	0	1660	0
Link Speed (mph)	45				45				40		40	
Link Distance (ft)	1911				4445				904		2404	
Travel Time (s)	29.0				67.3				15.4		41.0	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	27.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	86	1276	0	2	883	49	0	2	4	25	0	61
Future Vol, veh/h	86	1276	0	2	883	49	0	2	4	25	0	61
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	93	1387	0	2	960	53	0	2	4	27	0	66

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1013	0	0	1387	0	0	2597	2590	1387	2567	2564	987
Stage 1	-	-	-	-	-	-	1573	1573	-	991	991	-
Stage 2	-	-	-	-	-	-	1024	1017	-	1576	1573	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	684	-	-	494	-	-	17	25	175	~ 17	26	300
Stage 1	-	-	-	-	-	-	138	170	-	296	324	-
Stage 2	-	-	-	-	-	-	284	315	-	138	170	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	684	-	-	494	-	-	12	22	175	~ 14	22	300
Mov Cap-2 Maneuver	-	-	-	-	-	-	12	22	-	~ 14	22	-
Stage 1	-	-	-	-	-	-	119	147	-	256	323	-
Stage 2	-	-	-	-	-	-	220	314	-	115	147	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	82.2	\$ 742.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	53	684	-	-	494	-	-	43
HCM Lane V/C Ratio	0.123	0.137	-	-	0.004	-	-	2.174
HCM Control Delay (s)	82.2	11.1	-	-	12.3	-	-	\$ 742.3
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	0.4	0.5	-	-	0	-	-	9.9

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes and Geometrics
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%		0%		0%		0%		0%		0%	
Storage Length (ft)	500		880	450		300	700		500	800		500
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt	0.850		0.850		0.850		0.850		0.850		0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.133			0.114			0.089			0.400		
Satd. Flow (perm)	481	3539	1583	412	3539	1583	166	3539	1583	745	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			256			209			257			209
Link Speed (mph)	45				45			55			55	
Link Distance (ft)	1177				1609			1840			1644	
Travel Time (s)	17.8				24.4			22.8			20.4	

Intersection Summary

Area Type: Other

Timings
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	901	424	743	1305	89	186	492	236	42	1156	158
Future Volume (vph)	139	901	424	743	1305	89	186	492	236	42	1156	158
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	10.0	35.0		10.0	35.0		11.0	48.0		10.0	48.0	
Total Split (s)	10.0	35.0		25.0	50.0		12.0	50.0		10.0	48.0	
Total Split (%)	8.3%	29.2%		20.8%	41.7%		10.0%	41.7%		8.3%	40.0%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	35.0	30.0	120.0	55.0	45.0	120.0	52.6	46.0	120.0	48.0	42.0	120.0
Actuated g/C Ratio	0.29	0.25	1.00	0.46	0.38	1.00	0.44	0.38	1.00	0.40	0.35	1.00
v/c Ratio	0.57	1.11	0.29	1.17	1.07	0.06	1.22	0.39	0.16	0.14	1.02	0.11
Control Delay	30.0	106.2	0.5	122.8	81.8	0.1	166.1	28.5	0.2	19.4	68.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	106.2	0.5	122.8	81.8	0.1	166.1	28.5	0.2	19.4	68.4	0.1
LOS	C	F	A	F	F	A	F	C	A	B	E	A
Approach Delay		68.3			92.6			49.2			58.9	
Approach LOS		E			F			D			E	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.22

Intersection Signal Delay: 72.0

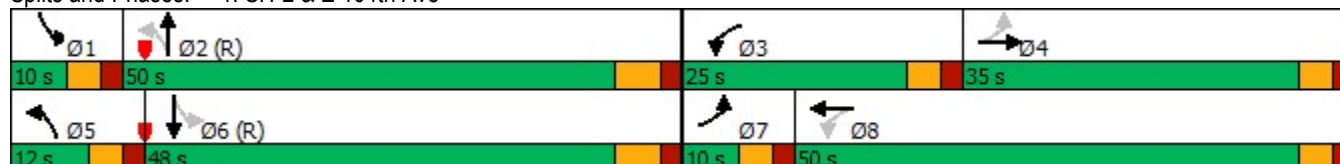
Intersection LOS: E

Intersection Capacity Utilization 105.9%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 1: SH-2 & E 104th Ave



HCM 6th Signalized Intersection Summary

1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	901	424	743	1305	89	186	492	236	42	1156	158
Future Volume (veh/h)	139	901	424	743	1305	89	186	492	236	42	1156	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	151	979	0	808	1418	0	202	535	0	46	1257	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	264	888		696	1333		164	1335		349	1244	
Arrive On Green	0.04	0.25	0.00	0.17	0.38	0.00	0.06	0.38	0.00	0.03	0.35	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	151	979	0	808	1418	0	202	535	0	46	1257	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.9	30.0	0.0	20.0	45.0	0.0	7.0	13.3	0.0	2.0	42.0	0.0
Cycle Q Clear(g_c), s	3.9	30.0	0.0	20.0	45.0	0.0	7.0	13.3	0.0	2.0	42.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	888		696	1333		164	1335		349	1244	
V/C Ratio(X)	0.57	1.10		1.16	1.06		1.23	0.40		0.13	1.01	
Avail Cap(c_a), veh/h	264	888		696	1333		164	1335		365	1244	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.2	45.0	0.0	36.6	37.5	0.0	31.1	27.5	0.0	23.9	39.0	0.0
Incr Delay (d2), s/veh	3.0	62.1	0.0	87.8	43.6	0.0	146.2	0.9	0.0	0.2	28.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.0	29.4	0.0	23.1	36.5	0.0	15.5	9.3	0.0	1.4	29.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.2	107.1	0.0	124.4	81.1	0.0	177.3	28.4	0.0	24.1	67.2	0.0
LnGrp LOS	D	F		F	F		F	C		C	F	
Approach Vol, veh/h		1130	A		2226	A		737	A		1303	A
Approach Delay, s/veh		97.9			96.8			69.2			65.6	
Approach LOS		F			F			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	51.1	25.0	35.0	12.0	48.0	10.0	50.0				
Change Period (Y+Rc), s	5.0	6.0	5.0	5.0	5.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	5.0	44.0	20.0	30.0	7.0	42.0	5.0	45.0				
Max Q Clear Time (g_c+l1), s	4.0	15.3	22.0	32.0	9.0	44.0	5.9	47.0				
Green Ext Time (p_c), s	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	85.7
HCM 6th LOS	F

Notes

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

Lanes and Geometrics
2: Revere St & E 104th Ave

Turnberry
07/13/2020

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	 	 			 			 			 		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%				0%				0%		0%		
Storage Length (ft)	330		0	375		300	200		0	100		0	
Storage Lanes	2		1	1		1	1		0	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt			0.850				0.850		0.901				0.850
Flt Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	1678	0	1770	1863	1583	
Flt Permitted	0.062			0.163			0.668			0.523			
Satd. Flow (perm)	224	3539	1583	304	3539	1583	1244	1678	0	974	1863	1583	
Right Turn on Red			Yes				Yes		Yes				Yes
Satd. Flow (RTOR)			136				136		72				110
Link Speed (mph)	30				30				30		30		
Link Distance (ft)	1727				1743				1045		913		
Travel Time (s)	39.3				39.6				23.8		20.8		

Intersection Summary

Area Type: Other

Timings 2: Revere St & E 104th Ave

Turnberry
07/13/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	41	1032	85	56	1651	75	228	57	111	20	101
Future Volume (vph)	41	1032	85	56	1651	75	228	57	111	20	101
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		Free	8		Free	2		6		6
Detector Phase	7	4		3	8		5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5	9.5	22.5	22.5
Total Split (s)	9.5	69.3		10.2	70.0		16.0	26.5	14.0	24.5	24.5
Total Split (%)	7.9%	57.8%		8.5%	58.3%		13.3%	22.1%	11.7%	20.4%	20.4%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max	None	C-Max	C-Max
Act Effect Green (s)	68.4	64.4	120.0	69.5	65.0	120.0	36.4	24.9	31.5	22.4	22.4
Actuated g/C Ratio	0.57	0.54	1.00	0.58	0.54	1.00	0.30	0.21	0.26	0.19	0.19
v/c Ratio	0.17	0.59	0.06	0.25	0.91	0.05	0.58	0.45	0.38	0.06	0.29
Control Delay	10.2	20.4	0.1	11.4	33.0	0.1	40.5	30.2	35.4	42.9	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	20.4	0.1	11.4	33.0	0.1	40.5	30.2	35.4	42.9	10.1
LOS	B	C	A	B	C	A	D	C	D	D	B
Approach Delay		18.5			30.8			36.1		25.0	
Approach LOS		B			C			D		C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 27.0

Intersection LOS: C

Intersection Capacity Utilization 75.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: Revere St & E 104th Ave

				
Ø1	Ø2 (R)	Ø3	Ø4	
14 s	26.5 s	10.2 s	69.3 s	
				
Ø5	Ø6 (R)	Ø7	Ø8	
16 s	24.5 s	9.5 s	70 s	

HCM 6th Signalized Intersection Summary

2: Revere St & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	1032	85	56	1651	75	228	57	111	111	20	101
Future Volume (veh/h)	41	1032	85	56	1651	75	228	57	111	111	20	101
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	45	1122	0	61	1738	0	248	62	121	121	22	110
Peak Hour Factor	0.92	0.92	0.92	0.92	0.95	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	274	1867		278	1881		461	124	242	331	360	305
Arrive On Green	0.03	0.53	0.00	0.04	0.53	0.00	0.10	0.22	0.22	0.07	0.19	0.19
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	1781	566	1105	1781	1870	1585
Grp Volume(v), veh/h	45	1122	0	61	1738	0	248	0	183	121	22	110
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1781	0	1671	1781	1870	1585
Q Serve(g_s), s	0.7	26.3	0.0	1.9	54.1	0.0	11.5	0.0	11.5	6.5	1.2	7.2
Cycle Q Clear(g_c), s	0.7	26.3	0.0	1.9	54.1	0.0	11.5	0.0	11.5	6.5	1.2	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.66	1.00		1.00
Lane Grp Cap(c), veh/h	274	1867		278	1881		461	0	366	331	360	305
V/C Ratio(X)	0.16	0.60		0.22	0.92		0.54	0.00	0.50	0.37	0.06	0.36
Avail Cap(c_a), veh/h	307	1919		299	1940		461	0	366	348	360	305
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	19.7	0.0	15.2	26.0	0.0	35.1	0.0	41.1	35.4	39.6	42.0
Incr Delay (d2), s/veh	0.3	0.5	0.0	0.4	7.9	0.0	1.3	0.0	4.8	0.7	0.3	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	16.1	0.0	1.4	31.8	0.0	10.4	0.0	9.0	5.2	1.0	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.2	20.2	0.0	15.6	33.9	0.0	36.3	0.0	45.9	36.1	39.9	45.3
LnGrp LOS	C	C		B	C		D	A	D	D	D	D
Approach Vol, veh/h		1167	A		1799	A		431			253	
Approach Delay, s/veh		20.4			33.3			40.4			40.4	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.8	30.8	8.8	67.6	16.0	27.6	8.4	68.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	9.5	22.0	5.7	64.8	11.5	20.0	5.0	65.5				
Max Q Clear Time (g_c+I1), s	8.5	13.5	3.9	28.3	13.5	9.2	2.7	56.1				
Green Ext Time (p_c), s	0.0	0.6	0.0	10.5	0.0	0.3	0.0	7.5				

Intersection Summary

HCM 6th Ctrl Delay 30.5
HCM 6th LOS C

Notes

User approved pedestrian interval to be less than phase max green.

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

Lanes and Geometrics
3: Potomac St & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%			0%		
Storage Length (ft)	575		0	450		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.976		0.910			0.856		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	0	1770	3454	0	1770	1695	0	1770	1595	0
Flt Permitted	0.096			0.098			0.689			0.640		
Satd. Flow (perm)	179	3539	0	183	3454	0	1283	1695	0	1192	1595	0
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)					28		39			101		
Link Speed (mph)	45				45		40			40		
Link Distance (ft)	3949				1321		1965			1374		
Travel Time (s)	59.8				20.0		33.5			23.4		

Intersection Summary

Area Type: Other

Timings 3: Potomac St & E 104th Ave

Turnberry
07/13/2020

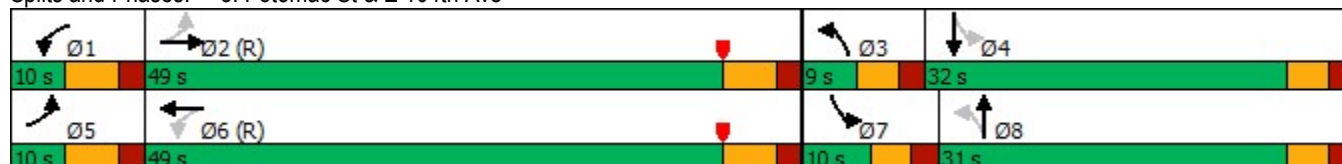
								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	53	1105	28	1829	15	24	351	4
Future Volume (vph)	53	1105	28	1829	15	24	351	4
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	7	4
Switch Phase								
Minimum Initial (s)	3.0	10.0	3.0	10.0	3.0	5.0	3.0	5.0
Minimum Split (s)	9.0	40.0	9.0	28.0	8.0	30.0	8.0	30.0
Total Split (s)	10.0	49.0	10.0	49.0	9.0	31.0	10.0	32.0
Total Split (%)	10.0%	49.0%	10.0%	49.0%	9.0%	31.0%	10.0%	32.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	Max	None	Max
Act Effect Green (s)	49.4	47.0	48.2	45.0	30.0	26.0	34.4	32.4
Actuated g/C Ratio	0.49	0.47	0.48	0.45	0.30	0.26	0.34	0.32
v/c Ratio	0.38	0.72	0.20	1.51	0.04	0.14	0.87	0.18
Control Delay	19.2	25.3	14.5	258.6	21.3	15.2	52.1	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	25.3	14.5	258.6	21.3	15.2	52.1	7.2
LOS	B	C	B	F	C	B	D	A
Approach Delay		25.0		255.6		16.4		42.4
Approach LOS		C		F		B		D

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 67 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.51
 Intersection Signal Delay: 157.8
 Intersection Capacity Utilization 97.1%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service F

Splits and Phases: 3: Potomac St & E 104th Ave



HCM 6th Signalized Intersection Summary

3: Potomac St & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (veh/h)	53	1105	0	28	1829	353	15	24	36	351	4	93
Future Volume (veh/h)	53	1105	0	28	1829	353	15	24	36	351	4	93
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	58	1201	0	30	1988	384	16	26	39	382	4	101
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	126	1610	0	183	1314	246	413	176	263	469	18	459
Arrive On Green	0.03	0.45	0.00	0.02	0.44	0.44	0.01	0.26	0.26	0.05	0.30	0.30
Sat Flow, veh/h	1781	3647	0	1781	2988	559	1781	675	1013	1781	61	1534
Grp Volume(v), veh/h	58	1201	0	30	1156	1216	16	0	65	382	0	105
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	1770	1781	0	1688	1781	0	1594
Q Serve(g_s), s	1.8	27.9	0.0	0.9	44.0	44.0	0.7	0.0	3.0	5.0	0.0	4.9
Cycle Q Clear(g_c), s	1.8	27.9	0.0	0.9	44.0	44.0	0.7	0.0	3.0	5.0	0.0	4.9
Prop In Lane	1.00		0.00	1.00		0.32	1.00		0.60	1.00		0.96
Lane Grp Cap(c), veh/h	126	1610	0	183	781	778	413	0	439	469	0	477
V/C Ratio(X)	0.46	0.75	0.00	0.16	1.48	1.56	0.04	0.00	0.15	0.81	0.00	0.22
Avail Cap(c_a), veh/h	143	1610	0	224	781	778	465	0	439	469	0	477
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.2	22.6	0.0	18.8	28.0	28.0	26.8	0.0	28.5	33.9	0.0	26.3
Incr Delay (d2), s/veh	2.6	3.2	0.0	0.4	222.5	259.7	0.0	0.0	0.7	10.6	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	16.8	0.0	0.7	98.9	112.1	0.5	0.0	2.2	12.1	0.0	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	25.8	0.0	19.2	250.5	287.7	26.9	0.0	29.2	44.5	0.0	27.3
LnGrp LOS	C	C	A	B	F	F	C	A	C	D	A	C
Approach Vol, veh/h	1259					2402		81		487		
Approach Delay, s/veh	25.8					266.4		28.7		40.8		
Approach LOS	C					F		C		D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.7	51.3	6.1	34.9	9.0	50.0	10.0	31.0				
Change Period (Y+Rc), s	6.0	6.0	5.0	5.0	6.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	4.0	43.0	4.0	27.0	4.0	43.0	5.0	26.0				
Max Q Clear Time (g_c+I1), s	2.9	29.9	2.7	6.9	3.8	46.0	7.0	5.0				
Green Ext Time (p_c), s	0.0	6.4	0.0	0.5	0.0	0.0	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay	164.3											
HCM 6th LOS	F											

Lanes and Geometrics
4: Peoria St./Peoria Pkwy & E 96th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%			0%		
Storage Length (ft)	150		250	220		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt					0.997							
Flt Protected	0.950			0.950							0.984	
Satd. Flow (prot)	1770	1863	1863	1770	1857	0	0	1863	0	0	1668	0
Flt Permitted	0.950			0.950							0.984	
Satd. Flow (perm)	1770	1863	1863	1770	1857	0	0	1863	0	0	1668	0
Link Speed (mph)	45			45			40			40		
Link Distance (ft)	1911			4445			904			2821		
Travel Time (s)	29.0			67.3			15.4			48.1		

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	58.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	37	640	0	2	1222	21	0	0	0	55	0	111
Future Vol, veh/h	37	640	0	2	1222	21	0	0	0	55	0	111
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	40	696	0	2	1328	23	0	0	0	60	0	121

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1351	0	0	696	0	0	2180	2131	696	2120	2120	1340
Stage 1	-	-	-	-	-	-	776	776	-	1344	1344	-
Stage 2	-	-	-	-	-	-	1404	1355	-	776	776	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	509	-	-	900	-	-	33	50	442	~ 37	50	187
Stage 1	-	-	-	-	-	-	390	407	-	187	220	-
Stage 2	-	-	-	-	-	-	173	218	-	390	407	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	509	-	-	900	-	-	11	46	442	~ 35	46	187
Mov Cap-2 Maneuver	-	-	-	-	-	-	11	46	-	~ 35	46	-
Stage 1	-	-	-	-	-	-	359	375	-	172	220	-
Stage 2	-	-	-	-	-	-	61	218	-	359	375	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	0	\$ 729
HCM LOS			A	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	509	-	-	900	-	-	77
HCM Lane V/C Ratio	-	0.079	-	-	0.002	-	-	2.343
HCM Control Delay (s)	0	12.7	-	-	9	-	-	\$ 729
HCM Lane LOS	A	B	-	-	A	-	-	F
HCM 95th %tile Q(veh)	-	0.3	-	-	0	-	-	16.9

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes and Geometrics
5: Peoria Pkwy/Revere St & E. 102nd Pl

Turnberry
07/13/2020



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.961				0.988	
Flt Protected	0.966		0.950			
Satd. Flow (prot)	1729	0	1770	1863	1840	0
Flt Permitted	0.966		0.950			
Satd. Flow (perm)	1729	0	1770	1863	1840	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	820			646	1243	
Travel Time (s)	18.6			14.7	28.3	

Intersection Summary

Area Type: Other

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	36	15	5	311	121	12
Future Vol, veh/h	36	15	5	311	121	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	16	5	338	132	13
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	487	139	145	0	-	0
Stage 1	139	-	-	-	-	-
Stage 2	348	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	540	909	1437	-	-	-
Stage 1	888	-	-	-	-	-
Stage 2	715	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	538	909	1437	-	-	-
Mov Cap-2 Maneuver	538	-	-	-	-	-
Stage 1	885	-	-	-	-	-
Stage 2	715	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.5	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1437	-	611	-	-	
HCM Lane V/C Ratio	0.004	-	0.091	-	-	
HCM Control Delay (s)	7.5	-	11.5	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.3	-	-	

Lanes and Geometrics
6: Peoria Pkwy & Quentin St

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt		0.963			0.909			0.999			0.998	
Flt Protected		0.965			0.984		0.950			0.950		
Satd. Flow (prot)	0	1731	0	0	1666	0	1770	1861	0	1770	1859	0
Flt Permitted		0.965			0.984		0.950			0.950		
Satd. Flow (perm)	0	1731	0	0	1666	0	1770	1861	0	1770	1859	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		504			833			463			646	
Travel Time (s)		11.5			18.9			10.5			14.7	
Intersection Summary												
Area Type:	Other											

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	0	3	9	0	19	1	290	3	6	128	2
Future Vol, veh/h	7	0	3	9	0	19	1	290	3	6	128	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	0	3	10	0	21	1	315	3	7	139	2
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	483	474	140	475	474	317	141	0	0	318	0	0
Stage 1	154	154	-	319	319	-	-	-	-	-	-	-
Stage 2	329	320	-	156	155	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	494	489	908	500	489	724	1442	-	-	1242	-	-
Stage 1	848	770	-	693	653	-	-	-	-	-	-	-
Stage 2	684	652	-	846	769	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	478	486	908	496	486	724	1442	-	-	1242	-	-
Mov Cap-2 Maneuver	478	486	-	496	486	-	-	-	-	-	-	-
Stage 1	847	765	-	692	652	-	-	-	-	-	-	-
Stage 2	664	651	-	838	764	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.6		11		0		0.3					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1442	-	-	557	631	1242	-	-				
HCM Lane V/C Ratio	0.001	-	-	0.02	0.048	0.005	-	-				
HCM Control Delay (s)	7.5	-	-	11.6	11	7.9	-	-				
HCM Lane LOS	A	-	-	B	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-				

Lanes and Geometrics
7: Peoria Pkwy & E. 101st Ave.

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt		0.959			0.899			0.999			0.984	
Flt Protected		0.966			0.988		0.950			0.950		
Satd. Flow (prot)	0	1726	0	0	1655	0	1770	1861	0	1770	1833	0
Flt Permitted		0.966			0.988		0.950			0.950		
Satd. Flow (perm)	0	1726	0	0	1655	0	1770	1861	0	1770	1833	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		741			863			2821			463	
Travel Time (s)		16.8			19.6			64.1			10.5	
Intersection Summary												
Area Type:	Other											

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	44	0	19	5	0	14	6	236	2	5	121	15
Future Vol, veh/h	44	0	19	5	0	14	6	236	2	5	121	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	48	0	21	5	0	15	7	257	2	5	132	16

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	430	423	140	433	430	258	148	0	0	259	0	0
Stage 1	150	150	-	272	272	-	-	-	-	-	-	-
Stage 2	280	273	-	161	158	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	535	522	908	533	518	781	1434	-	-	1306	-	-
Stage 1	853	773	-	734	685	-	-	-	-	-	-	-
Stage 2	727	684	-	841	767	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	521	517	908	518	513	781	1434	-	-	1306	-	-
Mov Cap-2 Maneuver	521	517	-	518	513	-	-	-	-	-	-	-
Stage 1	849	770	-	730	682	-	-	-	-	-	-	-
Stage 2	709	681	-	819	764	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.8		10.4		0.2		0.3	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1434	-	-	598	689	1306	-
HCM Lane V/C Ratio	0.005	-	-	0.115	0.03	0.004	-
HCM Control Delay (s)	7.5	-	-	11.8	10.4	7.8	-
HCM Lane LOS	A	-	-	B	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	0	-

Lanes and Geometrics
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 			 		 	 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%		0%		0%		0%		0%		0%	
Storage Length (ft)	500		880	450		300	700		500	800		500
Storage Lanes	2		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850				0.850		0.850		0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.098			0.098			0.344			0.091		
Satd. Flow (perm)	354	3539	1583	354	3539	1583	641	3539	1583	170	3539	1583
Right Turn on Red			Yes				Yes		Yes		Yes	
Satd. Flow (RTOR)			265				164		519		164	
Link Speed (mph)	45				45				55		55	
Link Distance (ft)	1177				1609				1840		1644	
Travel Time (s)	17.8				24.4				22.8		20.4	

Intersection Summary

Area Type: Other

Timings
1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 			 		 	 	
Traffic Volume (vph)	238	1696	244	357	1380	113	629	1312	747	73	475	92
Future Volume (vph)	238	1696	244	357	1380	113	629	1312	747	73	475	92
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		Free	2		Free	6		Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	10.0	35.0		10.0	35.0		11.0	48.0		10.0	48.0	
Total Split (s)	10.0	46.0		10.0	46.0		14.0	54.0		10.0	50.0	
Total Split (%)	8.3%	38.3%		8.3%	38.3%		11.7%	45.0%		8.3%	41.7%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	6.0		5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effect Green (s)	46.0	41.0	120.0	46.0	41.0	120.0	58.2	50.0	120.0	50.0	44.0	120.0
Actuated g/C Ratio	0.38	0.34	1.00	0.38	0.34	1.00	0.48	0.42	1.00	0.42	0.37	1.00
v/c Ratio	0.98	1.52	0.17	1.48	1.24	0.08	1.73	0.97	0.51	0.58	0.40	0.06
Control Delay	79.2	270.8	0.2	257.6	150.5	0.1	362.8	51.9	1.2	34.6	29.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.2	270.8	0.2	257.6	150.5	0.1	362.8	51.9	1.2	34.6	29.3	0.1
LOS	E	F	A	F	F	A	F	D	A	C	C	A
Approach Delay		219.5			162.0			110.6			25.7	
Approach LOS		F			F			F			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.73

Intersection Signal Delay: 148.4

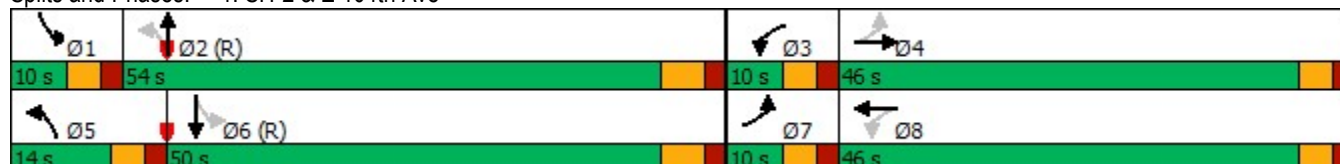
Intersection LOS: F

Intersection Capacity Utilization 122.5%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 1: SH-2 & E 104th Ave



HCM 6th Signalized Intersection Summary

1: SH-2 & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	238	1696	244	357	1380	113	629	1312	747	73	475	92
Future Volume (veh/h)	238	1696	244	357	1380	113	629	1312	747	73	475	92
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	259	1843	0	388	1500	0	684	1426	0	79	516	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	264	1214		264	1214		423	1424		133	1303	
Arrive On Green	0.04	0.34	0.00	0.04	0.34	0.00	0.08	0.40	0.00	0.04	0.37	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	259	1843	0	388	1500	0	684	1426	0	79	516	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.0	41.0	0.0	5.0	41.0	0.0	9.0	48.1	0.0	3.3	12.9	0.0
Cycle Q Clear(g_c), s	5.0	41.0	0.0	5.0	41.0	0.0	9.0	48.1	0.0	3.3	12.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	1214		264	1214		423	1424		133	1303	
V/C Ratio(X)	0.98	1.52		1.47	1.24		1.62	1.00		0.59	0.40	
Avail Cap(c_a), veh/h	264	1214		264	1214		423	1424		134	1303	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.8	39.5	0.0	36.3	39.5	0.0	35.9	36.0	0.0	30.1	28.2	0.0
Incr Delay (d2), s/veh	50.0	237.3	0.0	230.9	113.2	0.0	288.6	24.2	0.0	6.8	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.6	86.7	0.0	16.6	52.3	0.0	61.0	31.8	0.0	2.8	9.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.8	276.8	0.0	267.2	152.7	0.0	324.5	60.2	0.0	36.9	29.1	0.0
LnGrp LOS	F	F		F	F		F	F		D	C	
Approach Vol, veh/h		2102	A		1888	A		2110	A		595	A
Approach Delay, s/veh		253.3			176.2			145.9			30.1	
Approach LOS		F			F			F			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	54.1	10.0	46.0	14.0	50.0	10.0	46.0				
Change Period (Y+Rc), s	5.0	6.0	5.0	5.0	5.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	5.0	48.0	5.0	41.0	9.0	44.0	5.0	41.0				
Max Q Clear Time (g_c+I1), s	5.3	50.1	7.0	43.0	11.0	14.9	7.0	43.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay 177.9
HCM 6th LOS F

Notes

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

Lanes and Geometrics
2: Revere St & E 104th Ave

Turnberry
07/13/2020

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%				0%				0%		0%		
Storage Length (ft)	330		0	375		300	200		0	100		0	
Storage Lanes	2		1	1		1	1		0	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt			0.850				0.850		0.893				0.850
Flt Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	1663	0	1770	1863	1583	
Flt Permitted	0.091			0.056			0.711			0.484			
Satd. Flow (perm)	329	3539	1583	104	3539	1583	1324	1663	0	902	1863	1583	
Right Turn on Red			Yes				Yes		Yes				Yes
Satd. Flow (RTOR)			136				136		86				95
Link Speed (mph)	30				30				30		30		
Link Distance (ft)	1727				1743				1045		913		
Travel Time (s)	39.3				39.6				23.8		20.8		

Intersection Summary

Area Type: Other

Timings 2: Revere St & E 104th Ave

Turnberry
07/13/2020

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	118	2049	254	161	1435	88	166	38	143	64	64
Future Volume (vph)	118	2049	254	161	1435	88	166	38	143	64	64
Turn Type	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		Free	8		Free	2		6		6
Detector Phase	7	4		3	8		5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5	9.5	22.5	22.5
Total Split (s)	12.0	75.2		12.0	75.2		12.0	20.8	12.0	20.8	20.8
Total Split (%)	10.0%	62.7%		10.0%	62.7%		10.0%	17.3%	10.0%	17.3%	17.3%
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Max	None	C-Max	C-Max
Act Effect Green (s)	77.5	70.7	120.0	78.9	71.4	120.0	23.8	16.3	23.8	16.3	16.3
Actuated g/C Ratio	0.65	0.59	1.00	0.66	0.60	1.00	0.20	0.14	0.20	0.14	0.14
v/c Ratio	0.33	1.07	0.17	1.02	0.72	0.06	0.62	0.48	0.67	0.28	0.24
Control Delay	8.5	66.1	0.2	103.2	19.8	0.1	51.1	26.3	55.0	49.9	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.5	66.1	0.2	103.2	19.8	0.1	51.1	26.3	55.0	49.9	6.3
LOS	A	E	A	F	B	A	D	C	D	D	A
Approach Delay		56.4			26.9			40.1		42.2	
Approach LOS		E			C			D		D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 44.1

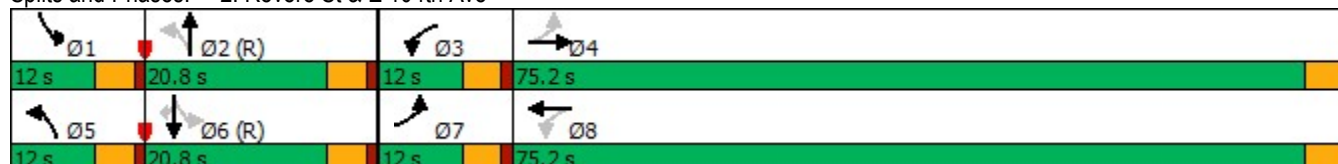
Intersection LOS: D

Intersection Capacity Utilization 96.3%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 2: Revere St & E 104th Ave



HCM 6th Signalized Intersection Summary

2: Revere St & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	2049	254	161	1435	88	166	38	94	143	64	64
Future Volume (veh/h)	118	2049	254	161	1435	88	166	38	94	143	64	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	128	2227	0	175	1511	0	180	41	102	155	70	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.95	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	479	2094		171	2170		299	65	161	239	254	215
Arrive On Green	0.04	0.59	0.00	0.06	0.61	0.00	0.06	0.14	0.14	0.06	0.14	0.14
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	1781	475	1182	1781	1870	1585
Grp Volume(v), veh/h	128	2227	0	175	1511	0	180	0	143	155	70	70
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1781	0	1658	1781	1870	1585
Q Serve(g_s), s	1.7	70.7	0.0	7.5	34.6	0.0	7.5	0.0	9.8	7.5	4.0	4.8
Cycle Q Clear(g_c), s	1.7	70.7	0.0	7.5	34.6	0.0	7.5	0.0	9.8	7.5	4.0	4.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.71	1.00		1.00
Lane Grp Cap(c), veh/h	479	2094		171	2170		299	0	225	239	254	215
V/C Ratio(X)	0.27	1.06		1.02	0.70		0.60	0.00	0.64	0.65	0.28	0.33
Avail Cap(c_a), veh/h	553	2094		171	2170		299	0	225	239	254	215
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.8	24.7	0.0	40.3	15.8	0.0	44.3	0.0	49.0	44.4	46.5	46.9
Incr Delay (d2), s/veh	0.3	39.2	0.0	74.5	1.0	0.0	3.4	0.0	12.9	6.0	2.7	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	51.9	0.0	13.6	19.6	0.0	2.9	0.0	8.5	2.2	3.7	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.1	63.8	0.0	114.8	16.8	0.0	47.7	0.0	61.9	50.4	49.2	50.9
LnGrp LOS	B	F		F	B		D	A	E	D	D	D
Approach Vol, veh/h	2355		A	1686		A	323				295	
Approach Delay, s/veh	61.1			27.0			54.0				50.2	
Approach LOS	E			C			D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	20.8	12.0	75.2	12.0	20.8	9.4	77.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.5	16.3	7.5	70.7	7.5	16.3	7.5	70.7				
Max Q Clear Time (g_c+I1), s	9.5	11.8	9.5	72.7	9.5	6.8	3.7	36.6				
Green Ext Time (p_c), s	0.0	0.3	0.0	0.0	0.0	0.3	0.1	15.8				

Intersection Summary

HCM 6th Ctrl Delay 47.6
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

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

Lanes and Geometrics
3: Potomac St & E 104th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%			0%		
Storage Length (ft)	575		0	450		0	200		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.999			0.978			0.906			0.853		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3536	0	1770	3461	0	1770	1688	0	1770	1589	0
Flt Permitted	0.089			0.093			0.691			0.665		
Satd. Flow (perm)	166	3536	0	173	3461	0	1287	1688	0	1239	1589	0
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)	1			26			35			100		
Link Speed (mph)	45			45			40			40		
Link Distance (ft)	3949			1321			1965			1374		
Travel Time (s)	59.8			20.0			33.5			23.4		

Intersection Summary

Area Type: Other

Timings 3: Potomac St & E 104th Ave

Turnberry
07/13/2020

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	106	2258	19	1773	6	19	373	2
Future Volume (vph)	106	2258	19	1773	6	19	373	2
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	3	8	7	4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	3	8	7	4
Switch Phase								
Minimum Initial (s)	3.0	10.0	3.0	10.0	3.0	5.0	3.0	5.0
Minimum Split (s)	9.0	40.0	9.0	28.0	8.0	30.0	8.0	30.0
Total Split (s)	9.0	53.0	9.0	53.0	8.0	30.0	8.0	30.0
Total Split (%)	9.0%	53.0%	9.0%	53.0%	8.0%	30.0%	8.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	C-Max	None	Max	None	Max
Act Effect Green (s)	53.6	52.4	50.0	47.0	28.0	25.0	32.0	31.4
Actuated g/C Ratio	0.54	0.52	0.50	0.47	0.28	0.25	0.32	0.31
v/c Ratio	0.84	1.33	0.16	1.38	0.02	0.12	0.98	0.18
Control Delay	62.2	176.8	12.6	199.7	22.8	15.6	75.6	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.2	176.8	12.6	199.7	22.8	15.6	75.6	7.0
LOS	E	F	B	F	C	B	E	A
Approach Delay		171.7		198.0		16.4		61.8
Approach LOS		F		F		B		E

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 67 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.38

Intersection Signal Delay: 170.7

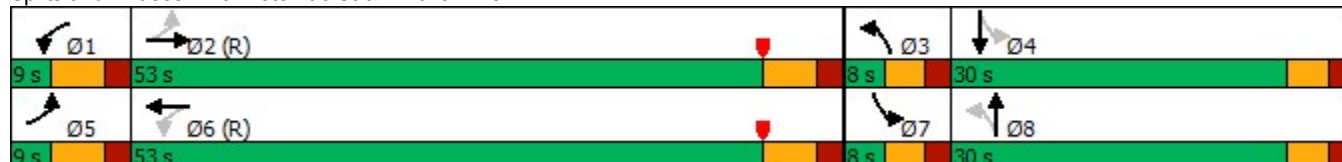
Intersection LOS: F

Intersection Capacity Utilization 107.5%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 3: Potomac St & E 104th Ave



HCM 6th Signalized Intersection Summary

3: Potomac St & E 104th Ave

Turnberry
07/13/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (veh/h)	106	2258	9	19	1773	306	6	19	32	373	2	92
Future Volume (veh/h)	106	2258	9	19	1773	306	6	19	32	373	2	92
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	2454	10	21	1927	333	7	21	35	405	2	100
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	125	1767	7	96	1431	240	372	158	263	428	9	428
Arrive On Green	0.03	0.49	0.49	0.01	0.47	0.47	0.01	0.25	0.25	0.03	0.27	0.27
Sat Flow, veh/h	1781	3630	15	1781	3044	511	1781	630	1051	1781	31	1559
Grp Volume(v), veh/h	115	1200	1264	21	1101	1159	7	0	56	405	0	102
Grp Sat Flow(s),veh/h/ln	1781	1777	1868	1781	1777	1778	1781	0	1681	1781	0	1590
Q Serve(g_s), s	3.0	48.7	48.7	0.6	47.0	47.0	0.3	0.0	2.6	3.0	0.0	5.0
Cycle Q Clear(g_c), s	3.0	48.7	48.7	0.6	47.0	47.0	0.3	0.0	2.6	3.0	0.0	5.0
Prop In Lane	1.00		0.01	1.00		0.29	1.00		0.63	1.00		0.98
Lane Grp Cap(c), veh/h	125	865	909	96	835	836	372	0	420	428	0	437
V/C Ratio(X)	0.92	1.39	1.39	0.22	1.32	1.39	0.02	0.00	0.13	0.95	0.00	0.23
Avail Cap(c_a), veh/h	125	865	909	125	835	836	416	0	420	428	0	437
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.5	25.7	25.7	24.6	26.5	26.5	27.9	0.0	29.1	38.1	0.0	28.1
Incr Delay (d2), s/veh	55.4	181.7	182.3	1.1	151.7	181.4	0.0	0.0	0.7	30.4	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.8	92.3	97.0	0.5	77.8	89.3	0.2	0.0	2.0	17.7	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.9	207.4	207.9	25.7	178.2	207.9	27.9	0.0	29.8	68.6	0.0	29.4
LnGrp LOS	F	F	F	C	F	F	C	A	C	E	A	C
Approach Vol, veh/h	2579			2281			63			507		
Approach Delay, s/veh	202.1			191.9			29.5			60.7		
Approach LOS	F			F			C			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.3	54.7	5.5	32.5	9.0	53.0	8.0	30.0				
Change Period (Y+Rc), s	6.0	6.0	5.0	5.0	6.0	6.0	5.0	5.0				
Max Green Setting (Gmax), s	3.0	47.0	3.0	25.0	3.0	47.0	3.0	25.0				
Max Q Clear Time (g_c+I1), s	2.6	50.7	2.3	7.0	5.0	49.0	5.0	4.6				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay	182.6											
HCM 6th LOS	F											

Lanes and Geometrics
4: Peoria St./Peoria Pkwy & E 96th Ave

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%			
Storage Length (ft)	150			250	220			0	0			0
Storage Lanes	1			1	1			0	0			0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt					0.989				0.910		0.905	
Flt Protected	0.950				0.950						0.985	
Satd. Flow (prot)	1770	1863	1863	1770	1842	0	0	1695	0	0	1660	0
Flt Permitted	0.950				0.950						0.985	
Satd. Flow (perm)	1770	1863	1863	1770	1842	0	0	1695	0	0	1660	0
Link Speed (mph)	45				45				40		40	
Link Distance (ft)	1911				4445				904		2821	
Travel Time (s)	29.0				67.3				15.4		48.1	

Intersection Summary

Area Type: Other

HCM 6th TWSC
4: Peoria St./Peoria Pkwy & E 96th Ave

Turnberry
07/13/2020

Intersection												
Int Delay, s/veh	74.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	125	1276	0	2	883	68	0	2	4	36	0	84
Future Vol, veh/h	125	1276	0	2	883	68	0	2	4	36	0	84
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	136	1387	0	2	960	74	0	2	4	39	0	91

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1034	0	0	1387	0	0	2706	2697	1387	2663	2660	997
Stage 1	-	-	-	-	-	-	1659	1659	-	1001	1001	-
Stage 2	-	-	-	-	-	-	1047	1038	-	1662	1659	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	672	-	-	494	-	-	14	21	175	~ 15	23	296
Stage 1	-	-	-	-	-	-	123	155	-	293	321	-
Stage 2	-	-	-	-	-	-	276	308	-	123	155	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	672	-	-	494	-	-	8	17	175	~ 11	18	296
Mov Cap-2 Maneuver	-	-	-	-	-	-	8	17	-	~ 11	18	-
Stage 1	-	-	-	-	-	-	98	124	-	234	320	-
Stage 2	-	-	-	-	-	-	190	307	-	94	124	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0	103.1	\$ 1517.2
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	43	672	-	-	494	-	-	34
HCM Lane V/C Ratio	0.152	0.202	-	-	0.004	-	-	3.836
HCM Control Delay (s)	103.1	11.7	-	-	12.3	-	-	\$ 1517.2
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	0.5	0.8	-	-	0	-	-	15.3

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes and Geometrics
5: Peoria Pkwy/Revere St & E. 102nd Pl

Turnberry
07/13/2020



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.960				0.986	
Flt Protected	0.966		0.950			
Satd. Flow (prot)	1727	0	1770	1863	1837	0
Flt Permitted	0.966		0.950			
Satd. Flow (perm)	1727	0	1770	1863	1837	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	820			646	1243	
Travel Time (s)	18.6			14.7	28.3	

Intersection Summary

Area Type: Other

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	24	10	17	222	353	41
Future Vol, veh/h	24	10	17	222	353	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	11	18	241	384	45

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	684	407	429	0	-	0
Stage 1	407	-	-	-	-	-
Stage 2	277	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	414	644	1130	-	-	-
Stage 1	672	-	-	-	-	-
Stage 2	770	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	407	644	1130	-	-	-
Mov Cap-2 Maneuver	407	-	-	-	-	-
Stage 1	661	-	-	-	-	-
Stage 2	770	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.6	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1130	-	456	-	-
HCM Lane V/C Ratio	0.016	-	0.081	-	-
HCM Control Delay (s)	8.2	-	13.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Lanes and Geometrics
6: Peoria Pkwy & Quentin St.

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt		0.961			0.912			0.993			0.996	
Flt Protected		0.966			0.983		0.950			0.950		
Satd. Flow (prot)	0	1729	0	0	1670	0	1770	1850	0	1770	1855	0
Flt Permitted		0.966			0.983		0.950			0.950		
Satd. Flow (perm)	0	1729	0	0	1670	0	1770	1850	0	1770	1855	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			833			463			646	
Travel Time (s)		11.9			18.9			10.5			14.7	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	5	0	2	6	0	12	4	223	10	21	334	8
Future Vol, veh/h	5	0	2	6	0	12	4	223	10	21	334	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	2	7	0	13	4	242	11	23	363	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	676	675	368	671	674	248	372	0	0	253	0	0
Stage 1	414	414	-	256	256	-	-	-	-	-	-	-
Stage 2	262	261	-	415	418	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	367	376	677	370	376	791	1186	-	-	1312	-	-
Stage 1	616	593	-	749	696	-	-	-	-	-	-	-
Stage 2	743	692	-	615	591	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	355	368	677	363	368	791	1186	-	-	1312	-	-
Mov Cap-2 Maneuver	355	368	-	363	368	-	-	-	-	-	-	-
Stage 1	614	582	-	747	694	-	-	-	-	-	-	-
Stage 2	728	690	-	602	580	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	13.9		11.6		0.1		0.5	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1186	-	-	411 568	1312	-	-
HCM Lane V/C Ratio	0.004	-	-	0.019 0.034	0.017	-	-
HCM Control Delay (s)	8	-	-	13.9 11.6	7.8	-	-
HCM Lane LOS	A	-	-	B B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1 0.1	0.1	-	-

Lanes and Geometrics
7: Peoria Pkwy & E. 101st Ave.

Turnberry
07/13/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor												
Frt		0.961			0.896			0.995			0.977	
Flt Protected		0.966			0.989		0.950			0.950		
Satd. Flow (prot)	0	1729	0	0	1651	0	1770	1853	0	1770	1820	0
Flt Permitted		0.966			0.989		0.950			0.950		
Satd. Flow (perm)	0	1729	0	0	1651	0	1770	1853	0	1770	1820	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		741			863			2821			463	
Travel Time (s)		16.8			19.6			64.1			10.5	
Intersection Summary												
Area Type:	Other											

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	0	12	3	0	9	21	198	6	15	276	50
Future Vol, veh/h	29	0	12	3	0	9	21	198	6	15	276	50
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	32	0	13	3	0	10	23	215	7	16	300	54
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	629	627	327	631	651	219	354	0	0	222	0	0
Stage 1	359	359	-	265	265	-	-	-	-	-	-	-
Stage 2	270	268	-	366	386	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	395	400	714	394	388	821	1205	-	-	1347	-	-
Stage 1	659	627	-	740	689	-	-	-	-	-	-	-
Stage 2	736	687	-	653	610	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	381	388	714	378	376	821	1205	-	-	1347	-	-
Mov Cap-2 Maneuver	381	388	-	378	376	-	-	-	-	-	-	-
Stage 1	646	619	-	726	676	-	-	-	-	-	-	-
Stage 2	713	674	-	633	603	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	14.1		10.8			0.8			0.3			
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1205	-	-	441	635	1347	-	-				
HCM Lane V/C Ratio	0.019	-	-	0.101	0.021	0.012	-	-				
HCM Control Delay (s)	8	-	-	14.1	10.8	7.7	-	-				
HCM Lane LOS	A	-	-	B	B	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.1	0	-	-				

APPENDIX “C”

TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

Traffic Signal Warrant Analysis Traffic Volumes

		Minor Street (Revere St.)				Major Street Total Both Approaches				
		SB - Revere St.				EB/WB - 104th Ave.				Rank
Hour of Day		2018 SB Approach Hourly Counts	Hourly Distribution % of Daily Volume	2022 Background SB Approach Forecast Hourly Counts	2040 Background SB Approach Forecast Hourly Counts	2018 Hourly Counts	Hourly Distribution % of Daily Volume	2022 Background Both Approaches Forecast Hourly Counts	2040 Background Both Approaches Forecast Hourly Counts	
0	to 1	4	0.34%	5	9	117	0.55%	134	250	22
1	to 2	5	0.43%	6	11	71	0.33%	82	152	24
2	to 3	5	0.43%	6	11	80	0.37%	92	171	23
3	to 4	4	0.34%	5	9	126	0.59%	145	270	21
4	to 5	14	1.20%	16	30	239	1.12%	274	512	19
5	to 6	45	3.87%	52	96	624	2.92%	717	1336	16
6	to 7	95	8.18%	109	203	1325	6.20%	1522	2837	7
7	to 8	115	9.90%	132	246	1555	7.28%	1786	3329	3
8	to 9	65	5.59%	75	139	1391	6.51%	1597	2978	6
9	to 10	45	3.87%	52	96	954	4.46%	1096	2043	13
10	to 11	46	3.96%	53	98	918	4.30%	1054	1965	14
11	to 12	52	4.48%	60	111	1027	4.81%	1179	2199	12
12	to 13	58	4.99%	67	124	1170	5.47%	1344	2505	8
13	to 14	60	5.16%	69	128	1107	5.18%	1271	2370	10
14	to 15	60	5.16%	69	128	1156	5.41%	1328	2475	9
15	to 16	64	5.51%	73	137	1533	7.17%	1760	3282	4
16	to 17	62	5.34%	71	133	1855	8.68%	2130	3972	1
17	to 18	105	9.04%	121	225	1853	8.67%	2128	3967	2
18	to 19	92	7.92%	106	197	1429	6.69%	1641	3059	5
19	to 20	67	5.77%	77	143	1098	5.14%	1261	2351	11
20	to 21	49	4.22%	56	105	751	3.51%	862	1608	15
21	to 22	27	2.32%	31	58	474	2.22%	544	1015	17
22	to 23	16	1.38%	18	34	326	1.53%	374	698	18
23	to 24	7	0.60%	8	15	192	0.90%	220	411	20
		1162	100.00%	1334	2488	21371	100.00%	24542	45755	

2018 Existing Traffic Signal Warrant Summary Worksheet

70%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: E 104th Ave and Revere St

County: Adams County

City: Commerce City

Major Street: E 104th Ave

Critical Approach Speed: 45 mph

Lanes: 2 or more lanes

Minor Street: Revere St

Critical Approach Speed: 30 mph

Lanes: 2 or more lanes

% Right Turns Included

From North (SB) 0%

From East (WB) 0%

From South (NB) 0%

From West (EB) 0%

In built-up area of isolated community of < 10,000 population? No

Total number of approaches at intersection? 4 or more

If it is a "T" intersection, inflate minor threshold to 150%? No

Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	No
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	Yes
Warrant 3: Peak Hour Volume	Yes
Warrant 4: Pedestrian Volume	0
Criterion A: Four-Hour	0
Criterion B: Peak-Hour	0
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:

Name: BSL

Agency: HKS

Date: 3/11/2020

Warrant 1: Eight - Hour Vehicular Volume

70%

Warrant Evaluated? Yes

Condition A : Min. Veh. Volume		
Volume Level	70%	56%
Major Rd. Req	420	336
Minor Rd. Req	140	112
Number of Hours	0	1

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	70%	56%
Major Rd. Req	630	504
Minor Rd. Req	70	56
Number of Hours	4	11

Satisfied? No

Condition C: Combination of A & B at 56%		
---	--	--

Satisfied? No

Warrant Satisfied? No

Manually Set To:

6:00 AM		Enter Start Time (Military Time) (HH:MM)			Total
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	
1	6:00	7:00	1325	95	1420
2	7:00	8:00	1555	115	1670
3	8:00	9:00	1391	65	1456
4	9:00	10:00	954	45	999
5	10:00	11:00	918	46	964
6	11:00	12:00	1027	52	1079
7	12:00	13:00	1170	58	1228
8	13:00	14:00	1107	60	1167
9	14:00	15:00	1156	60	1216
10	15:00	16:00	1533	64	1597
11	16:00	17:00	1855	62	1917
12	17:00	18:00	1853	105	1958
13	18:00	19:00	1429	92	1521
14	19:00	20:00	1098	67	1165
15	20:00	21:00	751	49	800
16	21:00	22:00	474	27	501

Warrant 2: Four-Hour Volume

70%

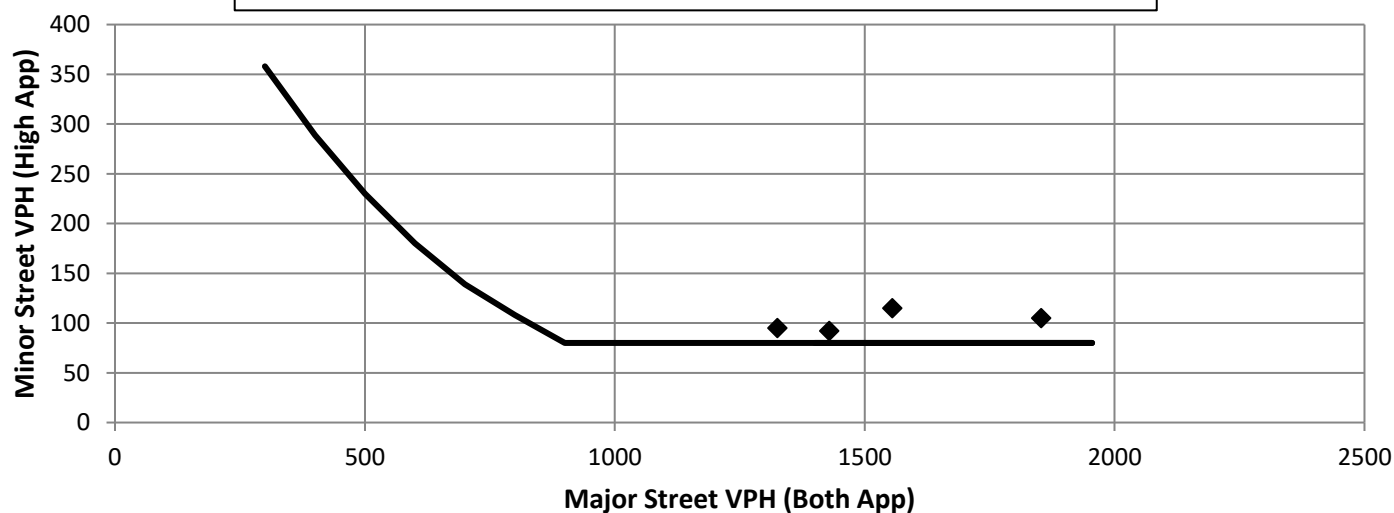
Warrant Evaluated? Yes

Warrant Satisfied? Yes

Manually Set To:

Hour Start	17:00	7:00	18:00	6:00
Major Road Vol.	1853	1555	1429	1325
Minor Road Vol.	105	115	92	95

Figure 4C-2 Warrant 2, Four-Hour Vehicular Volume (70% Factor)



Warrant 3: Peak Hour Volume

70%

Warrant Evaluated? Yes

Warrant Satisfied? Yes

Manually Set To:

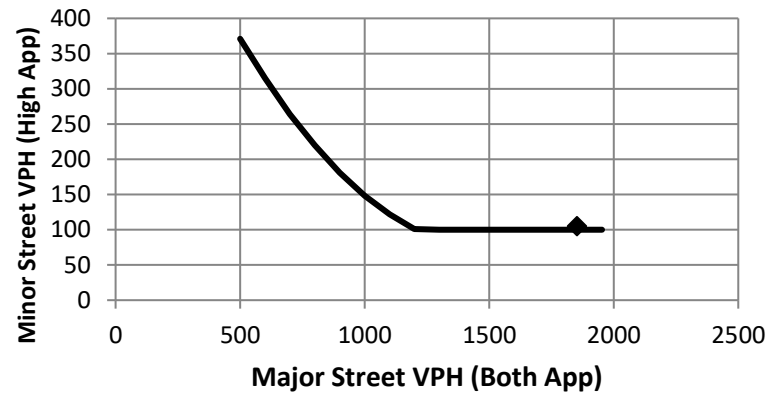
Condition justifying use of warrant:

Criteria		Met?
Delay on Minor Approach	5	No
Volume on Minor Approach	150	
Total Entering Volume (veh/h)	800	

Manually Set Peak Hour? No

Peak Hour	Major Road Vol. (Both App.)	Minor Road Vol. (High App.)
17:00	1853	105

Figure 4C-4 Warrant 3, Peak Hour (70% Factor)



2022 Background Traffic Signal Warrant Summary Worksheet

70%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: E 104th Ave and Revere St

County: Adams County

City: Commerce City

Major Street: E 104th Ave

Critical Approach Speed: 45 mph

Lanes: 2 or more lanes

Minor Street: Revere St

Critical Approach Speed: 30 mph

Lanes: 2 or more lanes

% Right Turns Included

From North (SB) 0%

From East (WB) 0%

From South (NB) 0%

From West (EB) 0%

In built-up area of isolated community of < 10,000 population? No

Total number of approaches at intersection? 4 or more

If it is a "T" intersection, inflate minor threshold to 150%? No

Manually set volume level? No

Analysis based on **PROJECTED** volume data.

Forecast Year	Within 5 Years of Construction?	Time (HH:MM)			
		From	AM / PM	To	AM / PM
2022	Yes				

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	Yes
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	Yes
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	Yes
Warrant 3: Peak Hour Volume	Yes
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	0
Criterion B: Peak-Hour	0
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:

Name: BSL

Agency: HKS

Date: 3/11/2020

Warrant 1: Eight - Hour Vehicular Volume

70%

Warrant Evaluated? Yes

Warrant Satisfied? Yes

Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	70%	56%
Major Rd. Req	420	336
Minor Rd. Req	140	112
Number of Hours	0	2

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	70%	56%
Major Rd. Req	630	504
Minor Rd. Req	70	56
Number of Hours	8	13

Satisfied? Yes

Condition C: Combination of A & B at 56%		
---	--	--

Satisfied? No

6:00 AM		Enter Start Time (Military Time) (HH:MM)			Total
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	
1	6:00	7:00	1522	109	1631
2	7:00	8:00	1786	132	1918
3	8:00	9:00	1597	75	1672
4	9:00	10:00	1096	52	1148
5	10:00	11:00	1054	53	1107
6	11:00	12:00	1179	60	1239
7	12:00	13:00	1344	67	1411
8	13:00	14:00	1271	69	1340
9	14:00	15:00	1328	69	1397
10	15:00	16:00	1760	73	1833
11	16:00	17:00	2130	71	2201
12	17:00	18:00	2128	121	2249
13	18:00	19:00	1641	106	1747
14	19:00	20:00	1261	77	1338
15	20:00	21:00	862	56	918
16	21:00	22:00	544	31	575

Warrant 2: Four-Hour Volume

70%

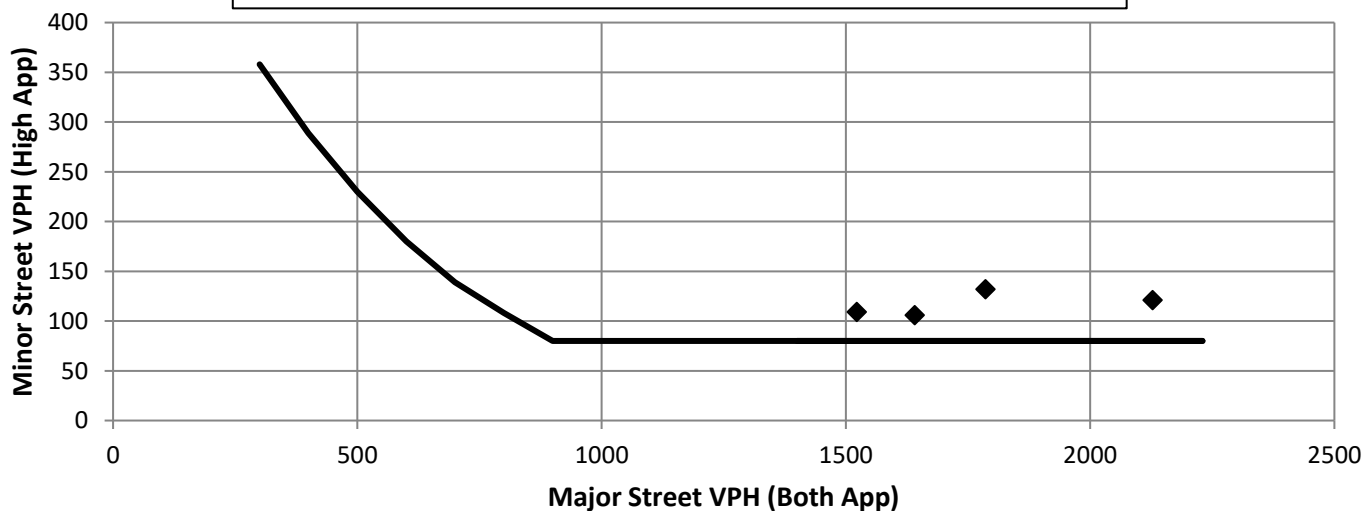
Warrant Evaluated? Yes

Warrant Satisfied? Yes

Manually Set To:

Hour Start	17:00	7:00	18:00	6:00
Major Road Vol.	2128	1786	1641	1522
Minor Road Vol.	121	132	106	109

Figure 4C-2 Warrant 2, Four-Hour Vehicular Volume (70% Factor)



Warrant 3: Peak Hour Volume

70%

Warrant Evaluated? Yes

Warrant Satisfied? Yes

Manually Set To:

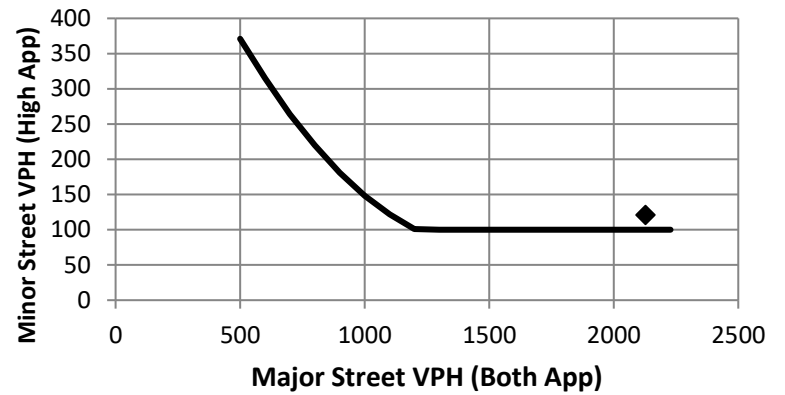
Condition justifying use of warrant:

Criteria		Met?
Delay on Minor Approach	5	No
Volume on Minor Approach	150	
Total Entering Volume (veh/h)	800	

Manually Set Peak Hour? No

Peak Hour	Major Road Vol. (Both App.)	Minor Road Vol. (High App.)
17:00	2128	121

Figure 4C-4 Warrant 3, Peak Hour (70% Factor)



2040 Background Traffic Signal Warrant Summary Worksheet

70%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: E 104th Ave and Revere St

County: Adams County

City: Commerce City

Major Street: E 104th Ave

Critical Approach Speed: 45 mph

Lanes: 2 or more lanes

Minor Street: Revere St

Critical Approach Speed: 30 mph

Lanes: 2 or more lanes

% Right Turns Included

From North (SB) 0%

From East (WB) 0%

From South (NB) 0%

From West (EB) 0%

In built-up area of isolated community of < 10,000 population? No

Total number of approaches at intersection? 4 or more

If it is a "T" intersection, inflate minor threshold to 150%? No

Manually set volume level? No

Analysis based on **PROJECTED** volume data.

Forecast Year	Within 5 Years of Construction?	Time (HH:MM)			
		From	AM / PM	To	AM / PM
2040	No				

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	Yes
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	Yes
Condition C: Combination: 80% of A and B	Yes
Warrant 2: Four-Hour Volume	Yes
Warrant 3: Peak Hour Volume	Yes
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	0
Criterion B: Peak-Hour	0
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:

Name: BSL

Agency: HKS

Date: 3/11/2020

Warrant 1: Eight - Hour Vehicular Volume

70%

Warrant Evaluated? Yes

Warrant Satisfied? Yes

Manually Set To:

Condition A : Min. Veh. Volume		
Volume Level	70%	56%
Major Rd. Req	420	336
Minor Rd. Req	140	112
Number of Hours	4	10

Satisfied? No

Condition B: Interruption of Continuous Traffic		
Volume Level	70%	56%
Major Rd. Req	630	504
Minor Rd. Req	70	56
Number of Hours	14	15

Satisfied? Yes

Condition C: Combination of A & B at 56%		
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Satisfied? Yes

6:00 AM		Enter Start Time (Military Time) (HH:MM)			Total
Time Period	From	To	Major Road: Both App. (VPH)	Minor Road: High App. (VPH)	
1	6:00	7:00	2837	203	3040
2	7:00	8:00	3329	246	3575
3	8:00	9:00	2978	139	3117
4	9:00	10:00	2043	96	2139
5	10:00	11:00	1965	98	2063
6	11:00	12:00	2199	111	2310
7	12:00	13:00	2505	124	2629
8	13:00	14:00	2370	128	2498
9	14:00	15:00	2475	128	2603
10	15:00	16:00	3282	137	3419
11	16:00	17:00	3972	133	4105
12	17:00	18:00	3967	225	4192
13	18:00	19:00	2351	143	2494
14	19:00	20:00	1608	105	1713
15	20:00	21:00	1015	58	1073
16	21:00	22:00	698	34	732

Warrant 2: Four-Hour Volume

70%

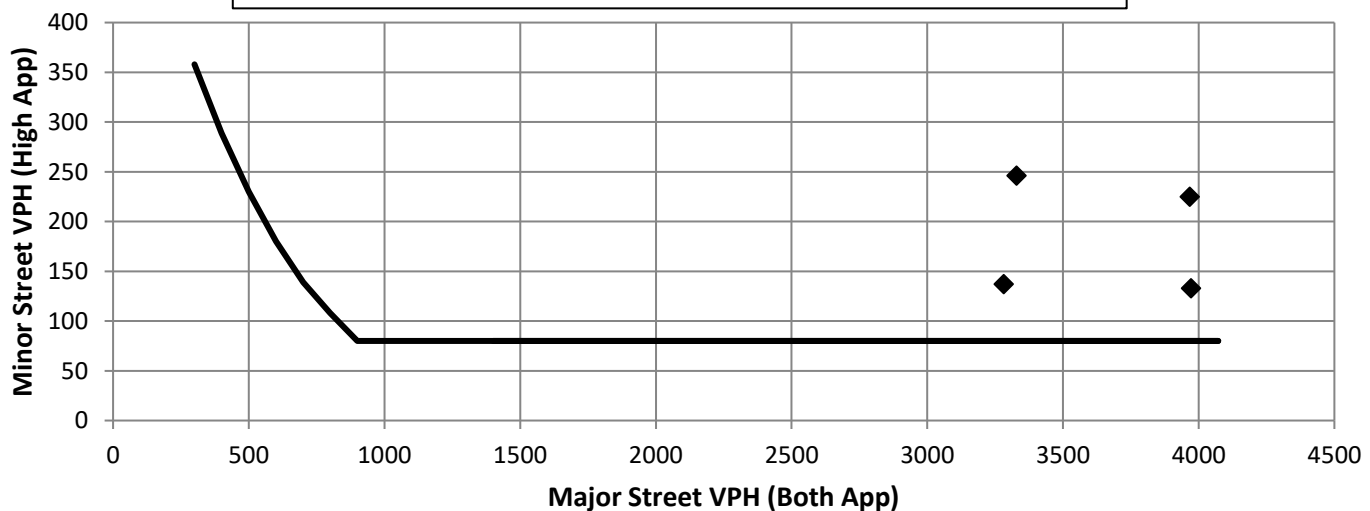
Warrant Evaluated? Yes

Warrant Satisfied? Yes

Manually Set To:

Hour Start	17:00	16:00	7:00	15:00
Major Road Vol.	3967	3972	3329	3282
Minor Road Vol.	225	133	246	137

Figure 4C-2 Warrant 2, Four-Hour Vehicular Volume (70% Factor)



Warrant 3: Peak Hour Volume

70%

Warrant Evaluated? Yes

Warrant Satisfied? Yes

Manually Set To:

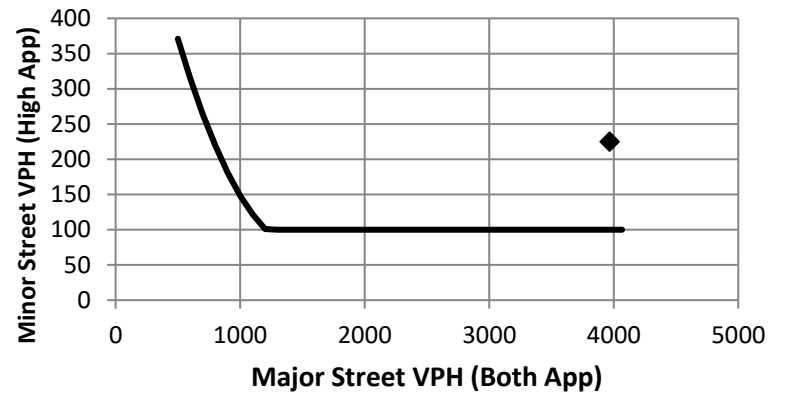
Condition justifying use of warrant:

Criteria		Met?
Delay on Minor Approach	5	Yes
Volume on Minor Approach	150	
Total Entering Volume (veh/h)	800	

Manually Set Peak Hour? No

Peak Hour	Major Road Vol. (Both App.)	Minor Road Vol. (High App.)
17:00	3967	225

Figure 4C-4 Warrant 3, Peak Hour (70% Factor)



2018 Existing Traffic Signal Warrant Summary Worksheet

70%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: E 96th Ave and Peoria St

County: Adams County

City: Commerce City

Major Street: E 96th Ave

Critical Approach Speed: 45 mph

Lanes: 2 or more lanes

Minor Street: Peoria St

Critical Approach Speed: 40 mph

Lanes: 2 or more lanes

% Right Turns Included

From North (SB) 0%

From East (WB) 0%

From South (NB) 0%

From West (EB) 0%

In built-up area of isolated community of < 10,000 population? No

Total number of approaches at intersection? 4 or more

If it is a "T" intersection, inflate minor threshold to 150%? No

Manually set volume level? No

Analysis based on EXISTING volume data.

Date	Day of the Week	Time (HH:MM)			
		From	AM / PM	To	AM / PM

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	N/A
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	N/A
Warrant 3: Peak Hour Volume	No
Warrant 4: Pedestrian Volume	0
Criterion A: Four-Hour	0
Criterion B: Peak-Hour	0
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:

Name: BSL

Agency: HKS

Date: 3/11/2020

Warrant 3: Peak Hour Volume

70%

Warrant Evaluated? Yes

Warrant Satisfied? No

Manually Set To:

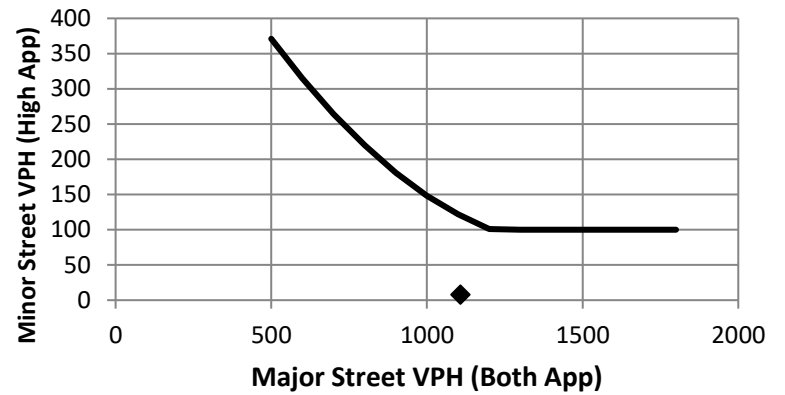
Condition justifying use of warrant:

Criteria		Met?
Delay on Minor Approach	5	No
Volume on Minor Approach	150	
Total Entering Volume (veh/h)	800	

Manually Set Peak Hour? No

Peak Hour	Major Road Vol. (Both App.)	Minor Road Vol. (High App.)
17:00	1108	8

Figure 4C-4 Warrant 3, Peak Hour (70% Factor)



2022 Total Traffic Signal Warrant Summary Worksheet

70%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: E 96th Ave and Peoria St

County: Adams County

City: Commerce City

Major Street: E 96th Ave

Critical Approach Speed: 45 mph

Lanes: 2 or more lanes

Minor Street: Peoria St

Critical Approach Speed: 40 mph

Lanes: 2 or more lanes

% Right Turns Included

From North (SB) 0%

From East (WB) 0%

From South (NB) 0%

From West (EB) 0%

In built-up area of isolated community of < 10,000 population? No

Total number of approaches at intersection? 4 or more

If it is a "T" intersection, inflate minor threshold to 150%? No

Manually set volume level? No

Analysis based on **PROJECTED** volume data.

Forecast Year	Within 5 Years of Construction?	Time (HH:MM)			
		From	AM / PM	To	AM / PM
2022	Yes				

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	N/A
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	N/A
Warrant 3: Peak Hour Volume	Yes
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	0
Criterion B: Peak-Hour	0
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:

Name: BSL

Agency: HKS

Date: 3/11/2020

Warrant 3: Peak Hour Volume

70%

Warrant Evaluated? Yes

Warrant Satisfied? Yes

Manually Set To:

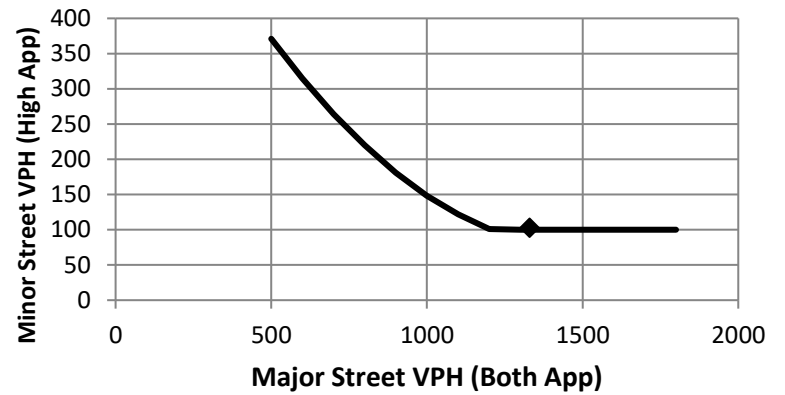
Condition justifying use of warrant:

Criteria		Met?
Delay on Minor Approach	5	No
Volume on Minor Approach	150	
Total Entering Volume (veh/h)	800	

Manually Set Peak Hour? No

Peak Hour	Major Road Vol. (Both App.)	Minor Road Vol. (High App.)
17:00	1330	103

Figure 4C-4 Warrant 3, Peak Hour (70% Factor)



2040 Total Traffic Signal Warrant Summary Worksheet

70%

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: E 96th Ave and Peoria St

County: Adams County

City: Commerce City

Major Street: E 96th Ave

Critical Approach Speed: 45 mph

Lanes: 2 or more lanes

Minor Street: Peoria St

Critical Approach Speed: 40 mph

Lanes: 2 or more lanes

% Right Turns Included

From North (SB) 0%

From East (WB) 0%

From South (NB) 0%

From West (EB) 0%

In built-up area of isolated community of < 10,000 population? No

Total number of approaches at intersection? 4 or more

If it is a "T" intersection, inflate minor threshold to 150%? No

Manually set volume level? No

Analysis based on **PROJECTED** volume data.

Forecast Year	Within 5 Years of Construction?	Time (HH:MM)			
		From	AM / PM	To	AM / PM
2040	No				

Warrant Evaluation Summary	Warrant Met:
Warrant 1: Eight - Hour Vehicular Volume	N/A
Condition A: Minimum Vehicular Volume	No
Condition B: Interruption of Continuous Traffic	No
Condition C: Combination: 80% of A and B	No
Warrant 2: Four-Hour Volume	N/A
Warrant 3: Peak Hour Volume	Yes
Warrant 4: Pedestrian Volume	N/A
Criterion A: Four-Hour	0
Criterion B: Peak-Hour	0
Warrant 5: School Crossing	N/A
Warrant 6: Coordinated Signal System	N/A
Warrant 7: Crash Experience	N/A
Warrant 8: Roadway Network	N/A
Warrant 9: Intersection Near a Grade Crossing	N/A

Warrant Analysis Conducted By:

Name: BSL

Agency: HKS

Date: 3/11/2020

Warrant 3: Peak Hour Volume

70%

Warrant Evaluated? Yes

Warrant Satisfied? Yes

Manually Set To:

Condition justifying use of warrant:

Criteria		Met?
Delay on Minor Approach	5	Yes
Volume on Minor Approach	150	
Total Entering Volume (veh/h)	800	

Manually Set Peak Hour? No

Peak Hour	Major Road Vol. (Both App.)	Minor Road Vol. (High App.)
17:00	2355	126

Figure 4C-4 Warrant 3, Peak Hour (70% Factor)

