

Gun Club Business Park Traffic Impact Study



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GUN CLUB BUSINESS PARK TRAFFIC IMPACT STUDY

1.0 Introduction

The Fox Tuttle Transportation Group has prepared this traffic impact study for the development of the Gun Club Business Park project. The 188± acres of vacant property are located in the City of Aurora west of Gun Club Road and south of Jewell Avenue. The property is across Gun Club Road from the Murphy Creek Golf Course and adjacent to the recently proposed Aspen Business Industrial Park project. It is understood that the development will serve light industrial businesses and commercial retail. Access to the site is planned to be located on Gun Club Road (SH 30) at two (2) locations with cross access into Aspen Business Park which will have three (3) accesses on Gun Club Road. Majority of the surrounding land is vacant but has been identified for future development of commercial and residential uses for the ever-growing City of Aurora. **Figure 1** provides a vicinity map for the proposed project.

The purpose of this study is to assist in identifying potential traffic impacts within the study area as a result of this project. The traffic study addresses existing, short-term, and long-term peak hour intersection conditions in the study area with and without the project-generated traffic. The information contained in this study is anticipated to be used by the City of Aurora staff in identifying any intersection or roadway deficiencies and potential improvements for the build-out condition and long-term future scenarios. This study focused on the weekday AM and PM peak hours which represents the periods of highest trip generation for the proposed use and adjacent street traffic. The study is consistent with the requirements of the City of Aurora's *Traffic Impact Study Guidelines (June 2015)*. The following supporting documents were reviewed and incorporated into this analysis as appropriate:

- Northeast Area Transportation Study. City of Aurora Planning & Development Services Department. October 2018.
- Murphy Creek East. LSC Transportation Consultants, Inc. March 2019.
- Parklands Master Traffic Study. Fox Tuttle Transportation Group. March 2022.
- Southeast Area Transportation Study. City of Aurora Planning & Development Services Department. August 2007.
- Aspen Business Industrial Park Traffic Impact Study. Fox Tuttle Transportation Group. September 2022.

2.0 Project Description

The Gun Club Business Park project plans to develop vacant land with up to 1,466,170± square feet of light/airport industrial businesses and approximately 19,500 square feet of commercial retail space. The project proposes to construct two (2) accesses on Gun Club Road (SH 30). The primary access is proposed to be full movement and signalized and aligned with the future Addison Avenue that will travel east of Gun Club Road (SH 30). A secondary access (North Access) is planned to be constructed approximately 1,265 feet north of the Addison Avenue and restricted to $\frac{3}{4}$ movement with side-street stop-controlled. There will be cross access from the Gun Club Business Park property into the Aspen Business Park to the south, which has another three (3) accesses on Gun Club Road that could be utilized by traffic to/from the Gun Club Business Park project. Each of those accesses has varying permitted movements, including a full-movement, signalized intersection at Yale Avenue and then one $\frac{3}{4}$ movement access and one right-in, right-out access. Refer to **Section 6.3** for additional discussion on the proposed access. Internally, local streets will be built to provide the most beneficial access into and around the site. For the purpose of this traffic study, it was assumed that the Gun Club Business Park project will be completed by Year 2027. **Figure 2** shows the site plan and proposed access locations.

3.0 Study Considerations

3.1 Data Collection

Intersection turning movement volumes were collected in October/November 2023 at three (3) existing intersections during the weekday AM and PM peak hours, including pedestrians and bicyclists. Daily traffic volumes were also collected on Jewell Avenue west of Gun Club Road and on Gun Club Road south of Jewell Avenue for 72 hours. Existing and historic traffic volumes on the study roadways were gathered from nearby development traffic studies, City of Aurora's NEATS and SEATS reports, Colorado Department of Transportation's (CDOT) Transportation Data Management System (TDMS) and CDOT's Online Transportation Information System (OTIS).

The existing traffic volumes are illustrated on **Figure 3**. The existing intersection geometry and traffic control are also shown on this figure. Count data sheets are provided in the **Appendix**.

3.2 Approved Developments and New Roadways

The East Aurora area is continuing to grow with new developments and new roadways to provide connections for current and future land uses. Adjacent to the Gun Club Business Park property, the following known development projects are approved, in review, or under construction: (1) Murphy Creek East, (2) Parklands I, (3) Parklands II, (4) Waterstone, and (5) Aspen Business Industrial Park. The trips from each of these developments were assumed to be included within the background growth in NEATS and SEATS.

In the future, Yale Avenue will be constructed as a four-lane minor arterial extending east of Gun Club Road to Watkins Road. Addison Avenue will be constructed as a two-lane collector roadway east of Gun Club Road into Murphy Creek. These roadways will likely be built as Murphy Creek is developed.

3.3 Evaluation Methodology

The traffic operations analysis addressed the signalized and unsignalized intersection operations using the procedures and methodologies set forth by the Highway Capacity Manual (HCM)¹. Existing peak hour factors (PHF) by approach and peak hour were applied to the study intersections for the existing scenarios. For long-term future scenarios, the PHF were set to 0.98 on Gun Club Road and 0.92 on other roadways in the future unless the existing PHF was greater than these values. Study intersections were evaluated using Synchro software (v11).

3.4 Level of Service Capacity Analysis

A Level of Service analysis was conducted to determine the existing and future performance of the study area intersections and accesses to determine the most appropriate intersection traffic controls and auxiliary lanes for future conditions.

To measure and describe the operational status of the study intersections, transportation engineers and planners commonly use a grading system referred to as “Level of Service” (LOS) that is defined by the *HCM*. LOS characterizes the operational conditions of an intersections traffic flow, ranging from LOS A (indicating very good, free flow operations) and LOS F (indicating congested and sometimes oversaturated conditions). These grades represent the perspective of drivers and are an indication of the comfort and

¹ Highway Capacity Manual, Highway Research Board Special Report 209, Transportation Research Board, National Research Council, 6th Edition (2016).

convenience associated with traveling through the intersections. The intersection LOS is represented as a delay in seconds per vehicle for the intersection as a whole and for each turning movement.

Typically, LOS A through C is considered to be acceptable for the overall intersection operations and LOS D overall during peak hours is acceptable. Individual movements may be allowed to fall to LOS E at signalized intersections. Minor movements at unsignalized intersections, such as left turns onto a major arterial, may be allowed to fall below LOS D, specifically where there are low volumes and/or no viable alternative per the City of Aurora's Traffic Impact Study Guidelines. Criteria contained in the HCM was applied for these analyses in order to determine peak hour LOS for each scenario. A more detailed discussion of LOS methodology is contained in the **Appendix** for reference.

4.0 Existing Conditions

4.1 Roadways

The study area boundaries are based on the amount of traffic to be generated by the project and potential impact to the existing roadway network. The primary public roadways that serve the project site are discussed in the following text and illustrated on **Figure 1**.

E-470 is a six-lane divided toll highway that provides regional access around the eastern and northern Denver metro area. The toll road currently extends 47 miles from C-470 at I-25 in Douglas County (west of the project site) to I-25 near 160th Avenue in Thornton where it becomes the Northwest Parkway. E-470 connects three counties, six municipalities, and Denver International Airport. E-470 has full-movement interchanges at Jewell Avenue. This expressway has a posted speed limit of 75 miles per hour (mph) and serves approximately 36,000 vehicles per day (vpd) near the interchange with Jewell Avenue (CDOT, Year 2022).

Gun Club Road (State Highway 30) is a two-lane, north-south, regional roadway that provides access through rural, urban, and growing parts of eastern Aurora, connecting the study area to an interchange at I-70/E-470 to the north and transitioning to Aurora Parkway to the south. Adjacent to the project property, Gun Club Road provides access to the Denver-Arapahoe Landfill. Gun Club Road is a CDOT facility that is classified as NR-B north of Yale Avenue and NR-A south of Yale Avenue per data provided in CDOT OTIS database. Adjacent to the project property, this roadway is classified as NR-B. Refer to **Section 6.3** for discussion on access. South of Jewell Avenue this roadway serves roughly 22,310 vpd (Year 2023) and has a posted speed limit of 55 mph.

Jewell Avenue is an east-west roadway that provides local access to the Murphy Creek neighborhood, rural homes to the east, and E-470 to the west. Jewell Avenue has transitions from two-lanes to four-lanes within the study area. Between E-470 and SH 30, Jewell Avenue is a two-lane major arterial with a posted speed limit of 45 mph. East of SH 30, Jewell Avenue becomes four-lanes along the Murphy Creek community (roughly ½ mile) and then narrows back to two lanes with the speed remaining 45 mph. Jewell Ave carries roughly 13,720 vpd between E-470 and Gun Club Road (Year 2023) and 7,300 vpd east of SH 30 (CDOT, Year 2022).

4.2 Intersections

The study area includes three (3) existing intersections that are listed below with the current traffic control and were analyzed for existing and future background year traffic operations:

1. Jewell Avenue at E-470 Southbound Ramps [stop-controlled]
2. Jewell Avenue at E-470 Northbound Ramps [stop-controlled]
3. Gun Club Road (SH 30) at Jewell Avenue [signalized]

The existing lane configuration at each of the study locations is illustrated on **Figure 3**.

4.3 Pedestrian and Bicycle

Currently, there are segments of sidewalk on both sides of Jewell Avenue east of Gun Club Road (SH 30). There are no sidewalks on Jewell Avenue west of Gun Club Road, or on Gun Club Road within the study area.

The High Plains Trail/E-470 Regional Trail follows the alignment of the E-470 toll road to the west of the study area, connecting several communities including the Town of Parker, City of Aurora, and City of Lone Tree. This multi-use path provides access to Chatfield Reservoir, the Platte River Trail, the Cherry Creek Trail, and several local recreational/commuter trails.

There are no on-street bike facilities or designated bike routes within the project study area. Bikes are encouraged to travel on the multi-use paths and are permitted to travel within general purpose lanes or shoulders of the study roadways.

4.4 Transit

The City of Aurora is serviced by Regional Transportation District (RTD). Currently, there is no transit service within the study area.

4.5 Year 2023 Existing Intersection Capacity Analysis

The existing volumes, lane configuration, and traffic control are illustrated on **Figure 3**. The details of LOS for each movement are provided in **Table 1** and the 95th percentile queues are provided in **Table 2** (refer to **Appendix**). The intersection Level of Service worksheets are attached in the **Appendix**. **Currently, the study intersections experience congestion and high delays, based on the capacity analysis.** The following study intersections currently operate at LOS E/F or have movements that operate at LOS E/F during the one of both peak hours:

- **#1 – Jewell Avenue at E-470 Southbound Ramps:** This stop-controlled intersection currently operates overall at LOS A in both peak hours; however, the southbound left-turn/through lane was estimated to operate at LOS F in both peak hours. The 95th percentile queues for this movement were calculated to be up to 60 feet (about three vehicles).

Recommendations: Signalize. The existing volumes at this intersection meet the signal warrant thresholds for Warrant 2 (4-hour) in 10 hours and the Warrant 3 (peak hour) in both peak hours². With the change in traffic control, the overall operations were estimated to be LOS B in both peak hours with all movements operating at LOS D or better in both peak hours. Refer to **Table 1** for the improved level of service and **Table 2** for reduced queues. It is understood that the City of Aurora is installing a temporary signal at this intersection before Year 2025.

- **#2 – Jewell Avenue at E-470 Northbound Ramps:** This stop-controlled intersection currently operates overall at LOS F in AM peak hour and LOS D in the PM peak hour due to the delay calculated for the northbound left-turn/through movement. The 95th percentile queues for this movement were calculated to be up to 445 feet (about 18 vehicles).

Recommendations: Signalize. The existing volumes at this intersection meet the signal warrant thresholds for Warrant 2 (4-hour) in nine (9) hours and the Warrant 3 (peak hour) in both peak hours. With the change in traffic control, the overall operations were estimated to be LOS B in both peak hours with all movements operating at LOS C or better in both peak hours. Refer to **Table 1** for the improved level of service and **Table 2** for reduced queues. It is understood that the City of Aurora is installing a temporary signal at this intersection before Year 2025.

² The Manual on Uniform Traffic Control Devices (MUTCD) signal Warrant 3 for the peak hour was utilized, for planning purposes, to determine if a signal should be considered as the traffic control. These intersections were further analyzed using MUTCD Warrant 2 for Four-Hour Vehicular Volume. Peak hour volumes were extrapolated to previous and later hours by utilizing hourly data provided in the daily roadway counts.

- **#3 – Gun Club Road (SH 30) at Jewell Avenue:** This signalized intersection currently operates overall at LOS E in the AM peak hour and LOS D in the PM peak hour. There are several movements that currently operate at LOS E/F in one or both peak hour due to the high volumes on all approaches and limited green time. During the morning peak hour, the eastbound through, westbound left-turn, and westbound through movements operate at LOS E/F. During the afternoon peak hour, the same movements were estimated to operate at LOS F. The 95th percentile queue in the westbound left-turn lane is anticipated to be maintained in the existing storage length. The eastbound/westbound through movements were estimated to typically clear in two cycle lengths and 95th percentile queues were less than 450 feet.

Recommendations: During the AM peak hour, consider providing an overlap phase for the eastbound right-turn movement and retiming the signal to provide more green time to Jewell Avenue, which can be accomplished without sacrificing operational performance on Gun Club Road (SH 30). If 10 seconds were redistributed from the main through phase to the side-street through phase, then the overall LOS would improve to LOS D and the delay on the eastbound and westbound movements would decrease significantly.

During the PM peak hour, consider providing an overlap phase for the eastbound right-turn movement and retiming the signal to provide more green time to Jewell Avenue, which can be accomplished without sacrificing operational performance on Gun Club Road (SH 30). If 10 seconds were redistributed from the main through phase to the side street through phase, then the delay on the eastbound and westbound movements would decrease significantly. Refer to **Table 1** for the improved level of service and **Table 2** for reduced queues.

5.0 Future Conditions

5.1 Annual Growth Factor and Future Volume Methodology

In order to forecast the future peak hour traffic volumes, background traffic growth assumptions were estimated based on the City's NEATS Refresh report, Murphy Creek East Traffic Study, Parklands Traffic Impact Study, and CDOT 20-year factors. The listed studies incorporated vehicular traffic associated with the Gun Club Business Park project and nearby developments.

Based on CDOT data, the 20-Year factor on Gun Club Road was 1.79 between Jewell Avenue and Hampden Avenue, which equates to an annual growth rate of 3.0%. This was applied to the existing intersection volumes for the Year 2027 background scenario, and this growth is assumed to include some completion of the nearby developments listed in **Section 3.2**.

Year 2050 roadway volumes from the NEATS Refresh was assumed to include the site-generated trips from developments within and near the study area, as well as the trips associated with Gun Club Business Park and adjacent developments. The following methodology was used to attain the Year 2050 background peak hour traffic projections:

1. Utilized the 2040 Background + Project volumes in the Aspen Business Industrial Park Traffic Impact Study through the study intersections for the baseline for forecasting into the long-term future. This adjacent project utilized the forecasts in the Parklands project, which was based on NEATS Refresh roadway volumes to determine the future volumes through the intersections. The turning movements were based on the existing travel patterns and anticipated future roadway network. Refer to **Appendix** for relevant pages.
2. Included the volumes to/from Yale Avenue and Addison Avenue as estimated in the Murphy Creek East Traffic Study (refer to **Appendix** for relevant pages). Adjusted through volumes on Gun Club Road to balance the roadway network.
3. Compared the 'Ultimate Roadway Volumes' from the NEATS Refresh study to determine the anticipated growth by Year 2050. It was calculated that there will be approximately 2.0% annual growth within the study area from Year 2040 to Year 2050. This growth rate was applied to the intersection volumes to estimate the peak hour volumes. This was considered the "Year 2050 background + project" scenario is Gun Club Business Park traffic was included in the regional model.
4. Estimated the site-generated trips for the Gun Club Business Park project and assigned to the roadway network. Refer to **Section 6.0** for more details on trip generation, distribution, and assignment assumptions.
5. Subtracted the Gun Club Business Park trips from the "Year 2050 background + project volumes" from Step 3. These final volumes represent the "Year 2050 background" scenario. This ensures the project trips are not double counted since they were included in the NEATS Refresh forecasts.

Using these assumptions, the Year 2027 background traffic is summarized on **Figure 4** and the Year 2050 background traffic is summarized on **Figure 5**.

5.2 Year 2027 Anticipated Transportation Network

For comparison purposes, this traffic study assumes that some of the planned auxiliary lanes and mitigation measures listed previously would be included in the short-term background scenario. The following roadway and intersection improvements were assumed to be completed by Year 2027:

- **Gun Club Road (SH 30)** – Widen to two (2) lanes per direction.
- **Yale Avenue** – Construct east and west of Gun Club Road. To the east, this roadway will have two (2) lanes per direction and to the west it will be one (1) lane per direction.
- **Addison Avenue** – Construct east of Gun Club Road with one (1) lane per direction.
- **Jewell Avenue at E-470 Southbound Ramps** – Signalize [recommended in Existing scenario].
- **Jewell Avenue at E-470 Northbound Ramps** – Signalize [recommended in Existing scenario].
- **Gun Club Road (SH 30) at Yale Avenue** – Signalize as determined in the *Murphy Creek East Traffic Study*. Construct the east leg with two left-turn lanes and one right-turn lane. Construct one northbound right-turn lane and one southbound left-turn lane.

These roadway and intersection improvements were assumed to be in place in the background condition for the short-term scenario for comparison purposes with the project trips and are shown on **Figure 4**.

5.3 Year 2027 Background Intersection Capacity Analysis

The study area intersections were evaluated to determine baseline operations for the Year 2027 background scenario and to identify any capacity constraints associated with background traffic (refer to **Section 5.1** for growth assumptions). It was assumed that the roadway and intersection improvements listed in **Section 5.2** will be implemented by Year 2027 background. The background volumes, lane configuration, and traffic control are illustrated on **Figure 4**.

The Level of Service criteria discussed previously was applied to the study area intersections to determine the impacts with the short-term background volumes. This analysis assumes signal timing throughout the network would be adjusted to accommodate the additional lanes and changes in traffic volumes. The details of LOS for each movement are provided in **Table 1** and the 95th percentile queues are provided in **Table 2** (refer to **Appendix**). The intersection Level of Service worksheets are attached in the **Appendix**.

In summary, the majority of the study intersections were estimated to operate at LOS D or better in the Year 2027 background condition in both peak hours with majority of movements operating at LOS D or

better. The following intersections or movements were calculated to begin operating at LOS E/F in one or both peak hour in Year 2027 background as described below:

- **#3 – Gun Club Road (SH 30) at Jewell Avenue:** This signalized intersection was calculated to operate overall at LOS D in both peak hours. During the morning peak hour, the eastbound left-turn, westbound left-turn, westbound through, and northbound left-turn movements were estimated to operate at LOS E. During the afternoon peak hour, the eastbound left-turn, eastbound through, westbound left-turn, and northbound left-turn were estimated to operate at LOS E. The 95th percentile queues for the eastbound left-turn were calculated to be up to 122 feet (about five vehicles) and the queues for the westbound left-turn were calculated to be up to 173 feet (about seven vehicles). The 95th percentile queues for the northbound left-turn were calculated to be up to 211 feet (about nine vehicles). All of these queues can be maintained within the existing storage lengths.

Recommendations: No mitigation measures are recommended. The delays are less than the signal cycle length which indicates vehicles can clear in one cycle.

- **#103. Gun Club Road at Addison Avenue:** This future intersection was estimated to operate overall at LOS A in both peak hours with the westbound left-turn estimated to operate at LOS F in the PM peak hour. The high delay is related to the difficulty to turn onto Gun Club Road due to high volumes.

Recommendations: No mitigation measures are recommended. The intersection volumes are not approaching the signal warrant thresholds. If the experienced delays are uncomfortable for drivers, it is likely they will decide to turn right instead of left or use a different route. Monitor this intersection for safety.

5.4 Year 2050 Planned Transportation Network

For comparison purposes, this traffic study assumes that some of the planned roadways in NEATS Refresh and SEATS reports, as well as a new intersection and auxiliary lanes shown in other development traffic studies will be completed by Year 2050 background. If the future scenarios were evaluated with the existing roadway network, then it would be difficult to compare intersection operates when many of the intersections will be altered due to future volumes, capacity, and routing that are not associated with the project.

In addition to the improvements listed for Year 2027, the following roadway and intersection improvements were assumed to be completed by Year 2050:

- **Gun Club Road (SH 30)** – Widen to three (3) lanes per direction.
- **Jewell Avenue** – Widen to three (3) lanes per direction.
- **Jewell Avenue at E-470 Southbound Ramps** – Provide two (2) westbound left-turn lanes. With the widening of Jewell Avenue, continue to provide one (1) eastbound right-turn lane. The southbound right-turn lane volume indicated the need for channelization.
- **Jewell Avenue at E-470 Northbound Ramps** – Provide two (2) eastbound left-turn lanes. With the widening of Jewell Avenue, continue to provide one (1) westbound right-turn lane. The northbound right-turn lane volume indicated the need for channelization.
- **Gun Club Road (SH 30) at Jewell Avenue** – Provide two (2) left-turn lanes, three (3) through lanes, and one (1) right-turn lane on all four approaches. Consider constructing the northbound and eastbound right-turn as channelized. Optimize signal timing for future conditions.
- **Gun Club Road (SH 30) at Yale Avenue** – Provide a second southbound left-turn lane.

These roadway and intersection improvements were assumed to be in place in the background condition for the long-term scenario for comparison purposes with the project trips and are shown on **Figure 5**.

5.5 Year 2050 Background Intersection Capacity Analysis

The study area intersections were evaluated to determine baseline operations for the Year 2050 background scenario and to identify any capacity constraints associated with background traffic in the long-term scenario (refer to **Section 5.1** for growth assumptions). The long-term background volumes, lane configuration, and traffic control are illustrated on **Figure 5**.

The Level of Service criteria discussed previously was applied to the study area intersections to determine the impacts with the long-term background volumes. The analysis assumed the signal timing at all signalized intersections would be adjusted to accommodate the additional lanes and change in traffic volumes. It should be noted that the peak hour factors were adjusted to 0.98 on Gun Club Road and 0.92 on other roadways (if the existing factor is less than these values) since it is assumed that the peak periods will become longer with peak hour traffic spread more evenly over the hour as traffic increases than is experienced today.

The details of LOS for each movement are provided in **Table 1** and the 95th percentile queues are provided in **Table 2** (refer to **Appendix**). The intersection Level of Service worksheets are attached in the **Appendix**.

In summary, majority of the of the study intersections were estimated to operate overall at LOS D or better in both peak periods and the majority of movements were calculated to operate at LOS D or better. The following intersections or movements were calculated to operate at LOS E/F in one or both peak hour in Year 2050 background as described below:

- **#3 – Gun Club Road (SH 30) at Jewell Avenue:** This signalized intersection was estimated to operate at LOS F in both peak hours due to several movements operating at LOS E/F during one or both peak hours. All four left-turn movements were calculated to operate at LOS E/F in both peak hours due to the high volumes, protected only phasing, and limited green time. The 95th percentile queues for the eastbound left-turn were calculated to be up to 389 feet and for the westbound left-turn the queues were calculated to be up to 488 feet. The 95th percentile queues for the northbound left-turn were calculated to be up to 298 feet and for the southbound left-turn the queues were calculated to be up to 451 feet. During the AM peak hour, the westbound through, northbound through, and southbound through movements were estimated to operate below LOS D. During the PM peak hour, the through movements on all four (4) approaches were estimated to operate at LOS E/F.

Recommendations: No mitigation measures recommended. This intersection is built out with the auxiliary lanes necessary to accommodate the volumes. It is expected that protected-only left-turns will operate below LOS D at large intersections with limited green time to serve the high volumes on all approaches. When this intersection is widened, ensure the auxiliary lanes have adequate storage length to minimize impacts between adjacent turn and through lanes. If this level of delay is experienced, then there is potential that this intersection will need to be redesigned with non-traditional or grade-separated options to reduce safety concerns and improve efficiency. The exact intersection design was not evaluated as part of this traffic study.

6.0 Future Conditions with the Development

The Gun Club Business Park is anticipated to include light industrial uses and a small area of commercial retail space and for the purpose of this traffic study, it was assumed that the entire project will be complete by Year 2027.

6.1 Trip Generation

A trip generation estimate was performed to determine the traffic characteristics of the proposed development. The trip rates contained in the Institute of Transportation Engineers (ITE) *Trip Generation Handbook and Manual*³ were applied to estimate the traffic. The exact type of industrial land use is not known at this time; therefore, this traffic study applied the trip rates for “Industrial Park” [ITE #130], “Strip Retail Plaza (<40k)” [ITE 822], and “Fast Casual Restaurant” [ITE 930]. For the purpose of this analysis, it was assumed that the site will be constructed and occupied by Year 2027.

Table 3 provides the detailed trip generation estimates for the Gun Club Business Park project (refer to the **Appendix**). The proposed project is expected to experience mostly new trips, also known as ‘primary trips’, as well as non-auto trips which are discussed below:

Primary Trips. These trips are made specifically to visit the site and are considered “new” trips. Primary trips would not have been made if the proposed project did not exist. Therefore, this is the only trip type that increases the total number of trips made on a regional basis.

Non-Auto Trips. These trips are those that are completed by carpool, walking, biking, or transit. The non-auto trips were assumed to be 5% which includes any trips that remain internal to the site between two businesses.

Multi-Use (Internal) Trips. These internal trips occur from one land use or building to another within the site boundaries. Multi-use or multi-purpose trips typically do not affect the exterior site access points, nor add any additional traffic volumes to the adjacent street network. It is anticipated there will be some internal trips within Gun Club Business Park due to the mix of uses, especially between commercial businesses. ITE recommends that the internal capture calculations be conducted with the methodology presented in National Cooperative Highway Research Program’s (NCHRP) *Report 684: Enhancing Internal Trip Capture Estimation for Mixed-*

³ *Trip Generation Handbook and Manual, 11th Edition*, Institute of Transportation Engineers, 2021.

Use Developments⁴ which were utilized in this traffic study. Based on this methodology, it was calculated that the morning peak hour will have an internal capture rate of 1% and the evening peak hour will have an internal capture rate of 8%, which were applied to the trip estimate.

Pass-By Trips. A pass-by trip is an intermediate stop on route from an origin to the ultimate trip destination without route diversion. These are drivers that already utilize the adjacent roadways and choose to make a stop within the site and then continue to their destination. Pass-by trips do not create any increase in the traffic volumes within the primary impact area. In fact, the only impact of the pass-by trips is at the site driveways and adjacent intersections where through movements become turning movements into and out of the site. Therefore, pass-by trips have no additional impact on the road system beyond the site's driveways or immediately adjacent intersections. With or without pass-by trips, the total trips to/from a project will remain the same. Pass-by was only applied to the commercial retail portion of the project. Per ITE data, the pass-by percentage for retail is 40% and for the restaurant is 43% in the PM peak hour. For pass-by trips, the methodology set forth in the Trip Generation Manual (Chapter 10) was utilized. Calculations are provided in the **Appendix**.

The Gun Club Business Park project was estimated to generate approximately 5,004 daily trips with 507 trips in the AM peak hour and 521 trips in the PM peak hour. Per the ITE Trip Generation data, truck traffic is approximately 7% of the daily site traffic and 3% during the AM and PM peak hours. This is detailed on **Table 3**.

6.2 Trip Distribution and Assignment

The estimated trip volumes were distributed onto the study area street network based on existing traffic characteristics, land uses, and traffic patterns in the area, as well as regional growth and future roadway infrastructure. The existing volumes were utilized to determine where vehicles are coming from and going to within the study area, plus the route to get to major highways and anticipated destinations.

⁴ NCHRP Report 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments. Bochner, B., K. Hooper, B. Sperry, and R. Dunphy. Washington, DC: Transportation Research Board, 2011.

The following distributions were assumed for this project and are shown on **Figure 6**:

- North E-470 via Jewell Avenue: 20%
- South E-470 via Jewell Avenue: 15%
- North Gun Club Road (SH 30): 15%
- South Gun Club Road (SH 30): 30%
- West Jewell Avenue via Gun Club Road: 10%
- East Jewell Avenue via Gun Club Road: 10%

Using the distribution assumptions, the projected site traffic was assigned to the study area roadway network for the weekday AM and PM peak hour periods. The different land uses were assumed to use different access points to have the shortest route to their destination. The trip distribution for the industrial land use is shown on **Figure 7A**, the trip distribution for commercial retail is shown on **Figure 7B**, and the pass-by trip distribution is shown on **Figure 7C**.

6.3 Proposed Roadway Network and Access

Access to the Gun Club Business Park site is planned via two (2) driveways along Gun Club Road (SH 30). Additionally, project traffic will have the opportunity to use the three (3) accesses on Gun Club Road that will be constructed with the Aspen Business Industrial Park project due to an internal roadway connection. The primary access (middle access) is proposed to align with the future Addison Avenue which will be signalized in the long-term scenario per the Murphy Creek East Traffic Study. With the Gun Club Business Park project, it is anticipated that their primary access will need to include one eastbound left-turn lane, one eastbound through/right-turn lane, one northbound left-turn lane, and one southbound right-turn lane (based on auxiliary lane volume thresholds). The secondary access is proposed to be located on the north edge of the property and be restricted to $\frac{3}{4}$ movement. Trips from the Gun Club Business Park are anticipated to also use the north access ($\frac{3}{4}$ movement) of Aspen Business Industrial Park and the signal at Yale Avenue.

A secondary access (north access) is anticipated to need one eastbound left-turn lane, one eastbound through/right-turn lane, one northbound left-turn lane, and one southbound right-turn lane (based on auxiliary lane volume thresholds).

Gun Club Road (SH 30) is a CDOT facility and classified as NR-B along the project property per the CDOT OTIS database. The State Highway Access Code (March 2002) states that one (1) access will be granted per parcel and additional access will be allowed to relieve congestion on the roadway system, to maintain good highway design, and to maintain good land use design without causing hardship to an adjacent property or roadway system. The proposed accesses for the Gun Club Business Park project are anticipated to serve the site and future adjacent developments, provide good internal circulation, provide emergency access to all buildings, and reduce the width of the Addison Avenue approaches without impacting the roadway system or highway traffic flow, as described below:

- **Addison Avenue/Middle Access** is proposed to be the only full movement access for this project and be signalized. This access will also serve the future development of Murphy Creek to the east of Gun Club Road and provide additional east-west connectivity for the City of Aurora. This full movement access is approximately one-half mile from the signalized intersection at Jewell Avenue (to the north) and one-half mile from the future signal at Yale Avenue (to the south).
- **North Access** is proposed to be restricted to $\frac{3}{4}$ movement access and located approximately $\frac{1}{4}$ mile (1,265 feet) north of Addison Avenue/Middle Access and approximately 0.3-mile (1,520 feet) south of Jewell Avenue. This access will provide a second left-turn into the site and reduce southbound traffic on Gun Club Road as site traffic can enter the property prior to the Addison Avenue signal. The proposed southbound right-turn will reduce the impact of site-generated trips on the through traffic. The analysis indicates that this access will not negatively impact Gun Club Road (SH 30) or the traffic flow.
- **South Access** is proposed to be restricted to $\frac{3}{4}$ movement access (per Aspen Business Park Traffic Impact Study) and located approximately 1,125 feet south of the Addison Avenue/Middle Access. This access will be shared with Aspen Business Park. This access will provide another left-turn into the site and reduce northbound traffic on Gun Club Road. The proposed southbound right-turn will reduce the impact of site-generated trips on the through traffic. The analysis indicates that this access will not negatively impact Gun Club Road (SH 30) or the traffic flow.

All proposed accesses will require an access permit for approval by CDOT. The access permits will be submitted separately.

The proposed access intersections to accommodate the proposed trip volume are illustrated on **Figure 7**. The anticipated lane configuration and traffic control at the access and internal intersections are shown on **Figure 8** for Year 2027 and **Figure 9** for Year 2050. The need for turn lanes was based on turn volume, opposing volume, operations, and roadway classification. Internally, the circulating streets will be

constructed to provide the most beneficial access into and around the site with pedestrian and bicycle friendly amenities.

6.4 Future Multi-Modal Facilities

The Gun Club Business Park project proposes to have sidewalks throughout the property to connect internally and externally. Sidewalks will be included along the project frontage on Gun Club Road. Refer to the design plans for the locations, widths, and connections of the pedestrian and bicycle facilities associated with this project.

According to NEATS Refresh report, Jewell Avenue has been identified to be a primary bike route and provide future high frequency transit services. An enhanced grade-separated crossing was identified to be installed on Jewell Avenue at Murphy Creek trail. Gun Club Road is identified as a route for high frequency transit services in the future and pedestrian/bicyclist travel is anticipated to be off-street on parallel multi-use trails along Murphy Creek and E-470.

6.5 Year 2027 Background + Project Intersection Capacity Analysis

This section discusses impacts associated with the addition of the Gun Club Business Park development trips in the short-term scenario. The site-generated volumes were added to the Year 2027 background volumes and are illustrated on **Figure 8**. This figure also illustrates the necessary traffic control and lane configurations for all of the study intersections and proposed accesses. The recommended improvements in the Year 2027 background scenario were assumed to be implemented.

The study intersections are anticipated to operate similarly to the background conditions with the addition of project trips since the majority of the intersection and movement levels of service remain the same letter grade. The details of LOS for each movement are provided in **Table 1** and the 95th percentile queues are provided in **Table 2** (refer to **Appendix**). The intersection Level of Service worksheets are attached in the **Appendix**.

The following intersections are anticipated to have one or more movements that begin to operate below LOS D with the additional project trips:

- **#3 – Gun Club Road (SH 30) at Jewell Avenue:** This signalized intersection was estimated to continue to operate at LOS D in both peak hours. During the PM peak hour, the northbound left-turn was estimated to begin operating at LOS F. This is due to the limited capacity of two busy roadways. The 95th percentile queue was calculated to be up to 374 feet.

Recommendations: No mitigation measures recommended since this intersection is built out and it is typical for arterial-arterial intersections to have several movements experiencing delays equating to LOS E/F due to limited green time to serve several high-volume movements. Adjust the signal timing and phasing as traffic grows and patterns change to reduce delays as most appropriate.

6.6 Year 2050 Background + Project Intersection Capacity Analysis

This section discusses impacts associated with the addition of the Gun Club Business Park development trips in the long-term scenario. The site-generated volumes were added to the Year 2050 background volumes and are illustrated on **Figure 9**. This figure also illustrates the necessary traffic control and lane configurations for all of the study intersections and proposed accesses. The recommended improvements in the Year 2050 background scenario were assumed to be implemented.

The study intersections are anticipated to operate similarly to the background conditions with the project trips. The majority of the intersection and movement levels of service were estimated to the same letter grade with the majority of increased delays under 20 seconds. The details of LOS for each movement are provided in **Table 1** and the 95th percentile queues are provided in **Table 2** (refer to **Appendix**). The intersection Level of Service worksheets are attached in the **Appendix**.

The following intersections are anticipated to have one or more movements that begin to operate below LOS D with the additional project trips:

- **#3 – Gun Club Road (SH 30) at Jewell Avenue:** This signalized intersection was estimated to continue to operate at LOS F in both peak hours. Similar to the background scenario, several movements are expected to operate at LOS E/F in one or both peak hours due to high volumes on all approaches. The added trips increase the delays on already congested movements with the most impact on the northbound left-turn and northbound through movements in the PM peak hour. The northbound left-turn was estimated to begin to need at least two cycle lengths to clear the queue and the northbound through movement was estimated to experience an additional 10 seconds of delay that changes the letter grade from LOS E to LOS F.

The 95th percentile queue was calculated on the left-turn lanes were calculated to be up to 500 feet and the longest queue was calculated to be on the northbound through movement at approximately 1,095 feet in the AM peak hour.

Recommendations: No mitigation measures recommended since this intersection is built out and it is typical for arterial-arterial intersections to have several movements experiencing delays equating to LOS E/F due to limited green time to serve several high-volume movements. When this intersection is widened, ensure the auxiliary lanes have adequate storage length to minimize impacts between adjacent turn and through lanes. Adjust the signal timing and phasing as traffic grows and patterns change to reduce delays as most appropriate. If this level of delay is experienced, then there is potential that this intersection will need to be redesigned with non-traditional or grade-separated options to reduce safety concerns and improve efficiency. The exact intersection design was not evaluated as part of this traffic study.

- **#104 – Gun Club Road at the North Access [3/4 movement]:** This project intersection was estimated to operate overall at LOS A in both peak periods. During the morning peak hour, the northbound left-turn was estimated to operate at LOS F and the 95th percentile queue was calculated to be approximately 23 feet (one vehicle). During the afternoon peak hour, the eastbound right-turn and the northbound left-turn were calculated to operate at LOS E and LOS F, respectively. The 95th percentile queues for these two movements were calculated to be 20 feet (one vehicle).

Recommendations: No mitigation measures recommended. The queues are minimum and can be maintained within the future storage lengths. It is typical for a minor intersection to experience delay on an arterial roadway.

7.0 Queuing Analysis

A queuing analysis was performed to determine if the 95th percentile queues would be accommodated by the existing storage length, to determine the storage lengths for future auxiliary lanes, and if any of the queues would impact an upstream intersection/access. **Table 2** provides the existing and proposed storage lengths, as well as the 95th percentile queues for each existing and future scenario as calculated by Synchro (assuming each vehicle utilizes 25 feet of space). It should be noted that the 95th percentile queue length is a theoretical queue that is 1.65 standard deviations above the average queue length. In theory, the 95th percentile queue would be exceeded 5% of the time based on the average queue length, but it is also possible that a queue this long may not occur.

As shown in **Table 2**, majority of the queues are shorter than the provided storage length in all scenarios. The project trips do not significantly increase queues at the existing study intersections. The study

intersections that are at or near capacity will experience longer queues with any additional traffic. The queues between the proposed access intersections were evaluated to determine if queued vehicles would impact an upstream intersection. It was determined that the proposed intersections will not have queues that extend into or near adjacent intersections.

Recommended turn lanes storage lengths and taper lengths are also listed in **Table 2**, which are based on the volume thresholds set forth in the CDOT State Highway Access Code for the assumed posted speed of each study roadway. Gun Club Road (SH 30) is classified as NR-B adjacent to the Gun Club Business Park property.

8.0 Sensitivity Analysis

A sensitivity analysis was performed to address some of the CDOT concerns with truck volume conversion to passenger-car-equivalents at the access intersections on Gun Club Road. For this sensitivity analysis, the proposed accesses were evaluated to ensure the recommended traffic control and design can adequately accommodate the Gun Club Business Park trucks and the adjacent Aspen Business Park project.

The Gun Club Business Park project plans to have two (2) accesses adjacent to the property (as described in **Section 6.3**) and share the $\frac{3}{4}$ movement access at the property line with Aspen Business Industrial Park. The truck volume was multiplied by three (3) in the peak hours at each of the proposed accesses. The Gun Club Business Park project was estimated to have 13 trucks in the AM peak hour (8 entering and 5 exiting) and up to 13 trucks in the PM peak hour (7 entering and 6 exiting). Per ITE, the truck volumes are a subset of the vehicle trips and does not increase the total volume estimated for the project. The truck volumes were multiplied by three (3) and a capacity analysis was performed for Year 2027 and Year 2050 at the three (3) access intersections to understand if there are impacts due to truck traffic. Refer to **Table A2** for the summary of level of service and 95th percentile queues at the proposed accesses.

In summary, the proposed accesses will operate the same as previously evaluated and discussed. The overall LOS remains the same with minor increases in delay on the eastbound movements at all access intersections in the Year 2027 Background + Project scenario. It was calculated that the 95th percentile queues will be similar with some increase on the northbound left-turn and southbound right-turn movements. **The proposed accesses and recommended roadway improvements can accommodate the truck trips.**

9.0 Roadway Capacity

The City of Aurora defines the roadway capacity in the *Northeast Aurora Transportation Study (NEATS Refresh)* report. Roadway capacity can be defined as “the maximum traffic volume that a roadway can carry at a desired level of service”. Roadway capacity varies for different roadway classifications, surface types, number of lanes, geometric widths, area type (rural, urban), and terrain type (level, rolling, mountainous). *NEATS Refresh* provides acceptable buildout performance (LOS D-E threshold) based on classification, number of lanes and the Year 2050 daily volume. **Table 4** provides the roadway level of service within the Gun Club Business Park study area.

Table 4: Year 2050 Roadway Level of Service Summary

| Roadway | NEATS Classification | Lanes per Direction | Segment | 2050 | |
|---------------|----------------------|---------------------|---------------------------------|--------|-----|
| | | | | Volume | LOS |
| Jewell Avenue | Major Arterial | 3 | E-470 to Gun Club Road | 57,190 | D |
| | | | East of Gun Club Road | 59,030 | D |
| Gun Club Road | Major Arterial | 3 | Jewell Avenue to Addison Avenue | 51,540 | C |
| | | | Addison Avenue to Yale Avenue | 44,480 | B |

10.0 Conclusions

The Gun Club Business Park project plans to develop vacant land with up to 1,466,170± square feet of light/airport industrial businesses and approximately 19,500 square feet of commercial retail space. The project proposes to construct two (2) accesses on Gun Club Road (SH 30). The primary access is proposed to be full movement and signalized and aligned with the future Addison Avenue that will travel east of Gun Club Road (SH 30). A secondary access (North Access) is planned to be constructed approximately 1,265 feet north of the Addison Avenue and restricted to $\frac{3}{4}$ movement with side-street stop-controlled. There will be cross access from the Gun Club Business Park property into the Aspen Business Park to the south, which has another three (3) accesses on Gun Club Road that could be utilized by traffic to/from the Gun Club Business Park project. Each of those accesses has varying permitted movements, including a full-movement, signalized intersection at Yale Avenue and then one $\frac{3}{4}$ movement access and one right-in, right-out access. Refer to **Section 6.3** for additional discussion on the proposed access. Internally, local

streets will be built to provide the most beneficial access into and around the site. For the purpose of this traffic study, it was assumed that the Gun Club Business Park project will be completed by Year 2027.

The Gun Club Business Park is estimated to generate approximately 5,004 daily trips with about 507 trips occurring in the AM peak hour and 521 trips occurring in the PM peak hour at full build-out. **It was determined that the proposed roadway system can adequately accommodate the projected traffic volumes for buildout conditions.** It is acknowledged that the adjacent study intersections will continue to be congested and delays will be increased with any additional traffic in the peak periods. The recommendations listed on the following pages should be considered.

Existing/Background Conditions (Non-Project Related):

- **Yale Avenue** – Construct east of Gun Club Road with two lanes per direction. *[Short-term Background]*
- **Addison Avenue** – Construct east of Gun Club Road with one lane per direction. *[Short-term Background]*
- **Gun Club Road** – Widen to two lanes per direction. *[Short-term Background]*. Widen to three lanes per direction. *[Long-term Background]*
- **Jewell Avenue** – Widen to three lanes per direction. *[Long-term Background]*
- **Jewell Avenue at E-470 Southbound Ramps:** Signalize. *[Existing]* Provide two westbound left-turn lanes and continue to provide one eastbound right-turn lane. Channelize the southbound right-turn. *[Long-term Background]*
- **Jewell Avenue at E-470 Northbound Ramps:** Signalize. *[Existing]* Provide two eastbound left-turn lanes and continue to provide one westbound right-turn lane. Channelize the northbound right-turn. *[Long-term Background]*
- **Gun Club Road (SH 30) at Jewell Avenue:** During both peak periods, provide an overlap phase for the eastbound right-turn movement and increase green time for the through movements on Jewell Avenue by 10 seconds by reducing the through phase on Gun Club Road. *[Existing]* Provide two left-turn lanes, three through lanes, and one right-turn lane on all four approaches. Consider constructing the eastbound right-turn and northbound right-turn as channelized. *[Long-term Background]*

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- **Gun Club Road (SH 30) at Yale Avenue** – Signalize. Per *Murphy Creek East Traffic Study*, construct the two westbound left-turn lanes, one westbound right-turn lane, one northbound right-turn lane, and one southbound left-turn lane. *[Short-term Background]* Provide a second southbound left-turn. *[Long-term Background]*
 - **All signalized intersections:** Adjust signal timing as appropriate for increases in volume. Balance the green time to serve all the movements and pedestrian crossings.

Project Conditions:

- **North Access (3/4 movement) on Gun Club Road (SH 30):** Construct with one inbound and outbound lane. Construct one northbound left-turn lane and one southbound right-turn lane.
- **Gun Club Road (SH 30) at Addison Avenue:** Align with the future Addison Avenue and signalize. With the Gun Club Business Park, construct the eastbound approach with one eastbound left-turn lane, one eastbound through/right-turn lane. Construct one northbound left-turn lane and one southbound right-turn lane.

The proposed lengths of auxiliary lanes are listed in **Table 2**. Note that the traffic study provides technical information and evaluates the need for transportation mitigation as traffic grows, but it does not address infrastructure commitments or obligations of the Gun Club Business Park development.

Tables and Figures:

Table 1 – Peak Hour Intersection LOS Summary for Existing Intersections

Table 2 – Peak Hour Estimated Queues and Proposed Auxiliary Lanes

Table 3 – Trip Generation Summary

Table 4 – Year 2050 Roadway Level of Service Summary [IN REPORT]

Figure 1 – Vicinity Map

Figure 2 – Site Plan and Access Locations

Figure 3 – Existing Traffic Volumes

Figure 4 – Year 2027 Background Traffic Volumes

Figure 5 – Year 2050 Background Traffic Volumes

Figure 6A – Trip Distribution – Industrial

Figure 6B – Trip Distribution – Retail

Figure 6C – Trip Distribution – Retail Pass-By

Figure 7 – Site-Generated Traffic Volumes

Figure 8 – Year 2027 Background + Project Traffic Volumes

Figure 9 – Year 2050 Background + Project Traffic Volumes

Table 1 - Peak Hour Intersection Level of Service Summary

| Intersection and Lanes Groups | 2023 Existing | | | | 2023 Existing with Improvements | | | | 2027 Background | | | | 2027 Bkgrd + Project | | | | 2050 Background | | | | 2050 Bkgrd + Project | | | | |
|---|--------------------------|-----|---------|-----|---------------------------------|-------|---------|-------|------------------------|-------|---------|-------|------------------------|-------|---------|-------|------------------------|-------|---------|-------|------------------------|-------|---------|----|---|
| | AM Peak | | PM Peak | | AM Peak | | PM Peak | | AM Peak | | PM Peak | | AM Peak | | PM Peak | | AM Peak | | PM Peak | | AM Peak | | PM Peak | | |
| | Delay | LOS | Delay | LOS | Imprv. | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS | | |
| STOP SIGN CONTROL | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Jewell Ave at E-470 Southbound Ramps | 6 | A | 5 | A | | | | | | | | | | | | | | | | | | | | | |
| Eastbound Through | 0 | A | 0 | A | Refer to Signal Section | | | | Analyzed as Signalized | | | | Analyzed as Signalized | | | | Analyzed as Signalized | | | | Analyzed as Signalized | | | | |
| Eastbound Right | 0 | A | 0 | A | | | | | | | | | | | | | | | | | | | | | |
| Westbound Left | 10 | A | 11 | B | | | | | | | | | | | | | | | | | | | | | |
| Westbound Through | 0 | A | 0 | A | | | | | | | | | | | | | | | | | | | | | |
| Southbound Left+Through | 94 | F | 77 | F | | | | | | | | | | | | | | | | | | | | | |
| Southbound Right | 25 | C | 21 | C | | | | | | | | | | | | | | | | | | | | | |
| 2. Jewell Ave at E-470 Northbound Ramps | 81 | F | 31 | D | | | | | | | | | | | | | | | | | | | | | |
| Eastbound Left | 11 | B | 10 | B | Refer to Signal Section | | | | Analyzed as Signalized | | | | Analyzed as Signalized | | | | Analyzed as Signalized | | | | Analyzed as Signalized | | | | |
| Eastbound Through | 0 | A | 0 | A | | | | | | | | | | | | | | | | | | | | | |
| Westbound Through | 0 | A | 0 | A | | | | | | | | | | | | | | | | | | | | | |
| Westbound Right | 0 | A | 0 | A | | | | | | | | | | | | | | | | | | | | | |
| Northbound Left+Through | >120 | F | >120 | F | | | | | | | | | | | | | | | | | | | | | |
| Northbound Right | 11 | B | 13 | B | | | | | | | | | | | | | | | | | | | | | |
| 101. Gun Club Rd at Aspen Business Park Access (3/4 Mvmt) | | | | | | | | | | 0 | A | 0 | A | 1 | A | 0 | A | 0 | A | 0 | A | 0 | A | | |
| Eastbound Right | Future Intersection | | | | Not Applicable | | | | 13 | B | 15 | B | 13 | B | 16 | C | 12 | B | 15 | B | 12 | B | 16 | C | |
| Northbound Left | | | | | | | | | 12 | B | 13 | B | 13 | B | 13 | B | 12 | B | 12 | B | 11 | B | 13 | B | |
| Northbound Through | | | | | | | | | 0 | A | 0 | A | 0 | A | 0 | A | 0 | A | 0 | A | 0 | A | 0 | A | |
| Southbound Through | | | | | | | | | 0 | A | 0 | A | 0 | A | 0 | A | 0 | A | 0 | A | 0 | A | 0 | A | |
| Southbound Right | | | | | | | | | 0 | A | 0 | A | 0 | A | 0 | A | 0 | A | 0 | A | 0 | A | 0 | A | |
| 103. Gun Club Rd at Addison Avenue | | | | | | | | | | 0 | A | 3 | A | | | | | | | 0 | A | 0 | A | | |
| Westbound Left | Future Intersection | | | | Not Applicable | | | | 19 | C | >120 | F | Analyzed as Signalized | | | | Not Applicable | | | | 12 | B | 13 | B | |
| Westbound Right | | | | | | | | | 11 | B | 16 | C | | | | | | | | | 11 | B | 11 | B | |
| Northbound Through | | | | | | | | | 0 | A | 0 | A | | | | | | | | | 0 | A | 0 | A | |
| Northbound Right | | | | | | | | | 0 | A | 0 | A | | | | | | | | | 0 | A | 0 | A | |
| Southbound Left | | | | | | | | | 9 | A | 14 | B | | | | | | | | | 0 | A | 0 | A | |
| Southbound Through | | | | | | | | | 0 | A | 0 | A | | | | | | | | | 0 | A | 0 | A | |
| 104. Gun Club Rd at North Access [3/4 Mvmt] | | | | | | | | | | | | | | 0 | A | 0 | A | | | 0 | A | 0 | A | | |
| Eastbound Right | Project Intersection | | | | Not Applicable | | | | Project Intersection | | | | 15 | C | 13 | B | Project Intersection | | | | 25 | D | 36 | E | |
| Northbound Left | | | | | | | | | | | | | 14 | B | 10 | A | | | | | 55 | F | 70 | F | |
| Northbound Through | | | | | | | | | | | | | 0 | A | 0 | A | | | | | 0 | A | 0 | A | |
| Southbound Through | | | | | | | | | | | | | 0 | A | 0 | A | | | | | 0 | A | 0 | A | |
| Southbound Right | | | | | | | | | | | | | 0 | A | 0 | A | | | | | 0 | A | 0 | A | |
| | | | | | | | | | | | | | 0 | A | 0 | A | | | | | 0 | A | 0 | A | 0 |
| SIGNAL CONTROL | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Jewell Ave at E-470 Southbound Ramps | | | | | 12 | B | 17 | B | 15 | B | 22 | C | 18 | B | 24 | C | 10 | B | 17 | B | 12 | B | 21 | C | |
| Eastbound Through | Analyzed as Stop-Control | | | | Signalize | 18 | B | 21 | C | 23 | C | 33 | C | 26 | C | 36 | D | 20 | B | 23 | C | 20 | B | 28 | C |
| Eastbound Right | | | | | | 13 | B | 14 | B | 13 | B | 16 | B | 14 | B | 16 | B | 16 | B | 12 | B | 16 | B | 13 | B |
| Westbound Left | | | | | | 11 | B | 13 | B | 14 | B | 19 | B | 15 | B | 29 | C | 16 | B | 36 | D | 17 | B | 52 | D |
| Westbound Through | | | | | | 1 | A | 1 | A | 1 | A | 0 | A | 1 | A | 0 | A | 0 | A | 0 | A | 0 | A | 0 | A |
| Southbound Left+Through | | | | | | 28 | C | 28 | C | 32 | C | 29 | C | 38 | D | 30 | C | 38 | D | 54 | D | 52 | D | 54 | D |
| Southbound Right | | | | | | 38 | D | 46 | D | 42 | D | 54 | D | 42 | D | 54 | D | 0 | A | 0 | A | 0 | A | 0 | A |

Table 1 - Peak Hour Intersection Level of Service Summary

| Intersection and Lanes Groups | 2023 Existing | | | | 2023 Existing with Improvements | | | | 2027 Background | | | | 2027 Bkgrd + Project | | | | 2050 Background | | | | 2050 Bkgrd + Project | | | | | | | | | | | | | | | |
|---|---------------------|-----|--------------|-----|---|-------|---------|-------|-----------------|--------------------------|---------|-------|----------------------|-------|---------|-------|-----------------|-------|---------|-------|----------------------|-------|---------|-------|-----|-----|---|----|-----|---|----|-----|---|----|--|---|
| | AM Peak | | PM Peak | | AM Peak | | PM Peak | | AM Peak | | PM Peak | | AM Peak | | PM Peak | | AM Peak | | PM Peak | | AM Peak | | PM Peak | | | | | | | | | | | | | |
| | Delay | LOS | Delay | LOS | Imprv. | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS | | | | | | | | | | | |
| SIGNAL CONTROL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Jewell Ave at E-470 Northbound Ramps | | | | | 19 | | B | 14 | | B | 24 | | C | 22 | | C | 28 | | C | 29 | | C | 26 | | C | 14 | | B | 28 | | C | 15 | | B | | |
| Eastbound Left | Analyzed as | | Stop-Control | | Signalize | 18 | B | 13 | B | 32 | C | 26 | C | 40 | D | 48 | D | 30 | C | 24 | C | 30 | C | 25 | C | | | | | | | | | | | |
| Eastbound Through | | | | | | 1 | A | 1 | A | 1 | A | 1 | A | 1 | A | 0 | A | 1 | A | 1 | A | 1 | A | | | | | | | | | | | | | |
| Westbound Through | | | | | | 24 | C | 21 | C | 34 | C | 35 | C | 44 | D | 50 | D | 40 | D | 28 | C | 45 | D | 29 | C | | | | | | | | | | | |
| Westbound Right | | | | | | 12 | B | 12 | B | 13 | B | 14 | B | 13 | B | 14 | B | 16 | B | 21 | C | 16 | B | 22 | C | | | | | | | | | | | |
| Northbound Left+Through | | | | | | 34 | C | 31 | C | 37 | D | 32 | C | 37 | D | 34 | C | 53 | D | 34 | C | 53 | D | 34 | C | | | | | | | | | | | |
| Northbound Right | | | | | | 28 | C | 29 | C | 34 | C | 30 | C | 39 | D | 34 | C | 0 | A | 0 | A | 0 | A | 0 | A | | | | | | | | | | | |
| 3. Gun Club Rd at Jewell Ave | 73 | E | 45 | D | 38 | | D | 36 | | D | 40 | | D | 40 | | D | 44 | | D | 47 | | D | 102 | | F | 116 | | F | 104 | | F | 128 | | F | | |
| Eastbound Left | 45 | D | 43 | D | Provide overlap phase for EB Right; increase EBWB Thru phase by 10 sec. by reducing NB/SB Thru phase. | 47 | D | 45 | D | 74 | E | 63 | E | 73 | E | 62 | E | >150 | F | 91 | F | >150 | F | 90 | F | | | | | | | | | | | |
| Eastbound Through | >120 | F | 81 | F | | 52 | D | 60 | E | 48 | D | 58 | E | 45 | D | 57 | E | 46 | D | 110 | F | 48 | D | 110 | F | | | | | | | | | | | |
| Eastbound Right | 52 | D | 47 | D | | 32 | C | 38 | D | 35 | D | 29 | C | 50 | D | 28 | C | 0 | A | 0 | A | 0 | A | 0 | A | | | | | | | | | | | |
| Westbound Left | 63 | E | 86 | F | | 38 | D | 49 | D | 59 | E | 68 | E | 62 | E | 70 | E | 78 | E | >150 | F | 79 | E | >150 | F | | | | | | | | | | | |
| Westbound Through | >120 | F | 123 | F | | 66 | E | 55 | D | 57 | E | 55 | D | 46 | D | 53 | D | 114 | F | 97 | F | 114 | F | 97 | F | | | | | | | | | | | |
| Westbound Right | 46 | D | 43 | D | | 37 | D | 38 | D | 34 | C | 36 | D | 31 | C | 36 | D | 33 | C | 38 | D | 33 | C | 38 | D | | | | | | | | | | | |
| Northbound Left | 16 | B | 24 | C | | 24 | C | 30 | C | 63 | E | 63 | E | 67 | E | 104 | F | 86 | F | 85 | F | 108 | F | >150 | F | | | | | | | | | | | |
| Northbound Through | 23 | C | 20 | C | | 34 | C | 23 | C | 24 | C | 20 | B | 28 | C | 21 | C | 94 | F | 73 | E | 97 | F | 83 | F | | | | | | | | | | | |
| Northbound Right | 12 | B | 16 | B | | 16 | B | 18 | B | 19 | B | 21 | C | 22 | C | 23 | C | 0 | A | 0 | A | 0 | A | 0 | A | | | | | | | | | | | |
| Southbound Left | 18 | B | 16 | B | | 25 | C | 18 | B | 24 | C | 22 | C | 28 | C | 25 | C | >150 | F | >150 | F | >150 | F | >150 | F | | | | | | | | | | | |
| Southbound Through | 23 | C | 29 | C | | 32 | C | 34 | C | 31 | C | 34 | C | 38 | D | 39 | D | 62 | E | 84 | F | 67 | E | 103 | F | | | | | | | | | | | |
| Southbound Right | 17 | B | 17 | B | | 24 | C | 19 | B | 29 | C | 28 | C | 34 | C | 31 | C | 53 | D | 29 | C | 53 | D | 30 | C | | | | | | | | | | | |
| 102. Gun Club Rd at Yale Ave | | | | | | | | | | | | | 26 | | C | 23 | | C | 12 | | B | 27 | | C | 30 | | C | 38 | | D | 33 | | C | 36 | | D |
| Eastbound Left | Future Intersection | | | | Not Applicable | | | | | 51 | D | 50 | D | 51 | D | 50 | D | 35 | C | 32 | C | 35 | C | 32 | C | | | | | | | | | | | |
| Eastbound Through+Right | | | | | | | | | | 54 | D | 37 | D | 54 | D | 37 | D | 37 | D | 33 | C | 37 | D | 33 | C | | | | | | | | | | | |
| Westbound Left | | | | | | | | | | 51 | D | 35 | C | 51 | D | 35 | C | 38 | D | 33 | C | 38 | D | 33 | C | | | | | | | | | | | |
| Westbound Through+Right | | | | | | | | | | 53 | D | 38 | D | 53 | D | 38 | D | 36 | D | 36 | D | 36 | D | 36 | D | | | | | | | | | | | |
| Northbound Left | | | | | | | | | | 7 | A | 14 | B | 8 | A | 16 | B | 18 | B | 29 | C | 19 | B | 30 | C | | | | | | | | | | | |
| Northbound Through | | | | | | | | | | 11 | B | 19 | B | 11 | B | 20 | B | 34 | C | 41 | D | 40 | D | 43 | D | | | | | | | | | | | |
| Northbound Right | | | | | | | | | | 7 | A | 13 | B | 7 | A | 13 | B | 19 | B | 40 | D | 20 | B | 40 | D | | | | | | | | | | | |
| Southbound Left | | | | | | | | | | 7 | A | 14 | B | 8 | A | 15 | B | 39 | D | 46 | D | 43 | D | 46 | D | | | | | | | | | | | |
| Southbound Through | | | | | | | | | | 10 | A | 19 | B | 10 | B | 27 | C | 22 | C | 35 | C | 22 | C | 30 | C | | | | | | | | | | | |
| Southbound Right | | | | | | | | | | 8 | A | 11 | B | 8 | A | 15 | B | 17 | B | 20 | B | 18 | B | 15 | B | | | | | | | | | | | |
| 103. Gun Club Rd at Addison Avenue | | | | | | | | | | | | | 14 | | B | 17 | | B | 5 | | A | 7 | | A | 15 | | B | 23 | | C | | | | | | |
| Eastbound Left | Future Intersection | | | | Not Applicable | | | | | Analyzed as Stop-Control | | | | 38 | D | 47 | D | | | | | 49 | D | 51 | D | | | | | | | | | | | |
| Eastbound Through+Right | | | | | | | | | | | | | | 41 | D | 36 | D | | | | | 52 | D | 46 | D | | | | | | | | | | | |
| Westbound Left | | | | | | | | | | | | | | 36 | D | 34 | C | 53 | D | 51 | D | 47 | D | 49 | D | | | | | | | | | | | |
| Westbound Through+Right | | | | | | | | | | | | | | 41 | D | 39 | D | 0 | A | 0 | A | 50 | D | 52 | D | | | | | | | | | | | |
| Northbound Left | | | | | | | | | | | | | | 11 | B | 15 | B | | | | | 11 | B | 22 | C | | | | | | | | | | | |
| Northbound Through | | | | | | | | | | | | | | 12 | B | 5 | A | | | | | 7 | A | 9 | A | 15 | B | 15 | B | | | | | | | |
| Northbound Right | | | | | | | | | | | | | | 8 | A | 0 | A | 4 | A | 5 | A | 8 | A | 9 | A | | | | | | | | | | | |
| Southbound Left | | | | | | | | | | | | | | 9 | A | 10 | B | 9 | A | 13 | B | 20 | C | 31 | C | | | | | | | | | | | |
| Southbound Through | | | | | | | | | | | | | | 14 | B | 23 | C | 2 | A | 4 | A | 12 | B | 25 | C | | | | | | | | | | | |
| Southbound Right | | | | | | | | | | | | | | 10 | B | 12 | B | | | | | 9 | A | 13 | B | | | | | | | | | | | |

Note: Delay represented in average seconds per vehicle.

Table 2 - Peak Hour 95th Percentile Queue Summary and Proposed Auxiliary Lanes

| Intersection and Lanes Groups | Existing Storage Length (Feet) | 2023 Existing | | 2023 Existing with Improvement | | | 2027 Background | | 2027 Bkgrd + Project | | 2050 Background | | 2050 Bkgrd + Project | | Max. Queue | City and CDOT SHAC Requirement (NR-B) | | | | Proposed Minimum Future Storage |
|--|--------------------------------|---------------------|------|---|------|------|------------------|------|----------------------|------|------------------|-------|----------------------|-------|------------|---------------------------------------|--------------|----------------|--------------|---------------------------------|
| | | AM | PM | Imprv. | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | | Speed (mph) | Total (feet) | Storage (feet) | Taper (feet) | |
| 1. Jewell Ave at E-470 Southbound Ramps | | Side-Street Stop | | Signalized | | | Signalized | | Signalized | | Signalized | | Signalized | | | | | | | |
| Eastbound Through | - | 0' | 0' | Signalize | 336' | 472' | 466' | 667' | 565' | 687' | 327' | 826' | 339' | 909' | - | - | - | - | - | - |
| Eastbound Right | 300' | 0' | 0' | | 31' | 40' | 33' | 41' | 33' | 41' | 40' | 49' | 40' | 72' | 72' | 45 | 435 | 273' | 162 | 273' |
| Westbound Left | 250' | 13' | 13' | | 25' | 38' | 26' | 92' | 45' | 128' | 75' | 117' | 79' | 139' | 139' | 45 | 435 | 273' | 162 | 273' |
| Westbound Through | - | 0' | 0' | | 143' | 236' | 141' | 226' | 136' | 211' | 428' | 161' | 426' | 164' | - | - | - | - | - | - |
| Southbound Left+Through | - | 60' | 50' | | 47' | 44' | 139' | 64' | 229' | 88' | 232' | 250' | 354' | 256' | - | - | - | - | - | - |
| Southbound Right | - | 73' | 80' | | 48' | 51' | 81' | 90' | 83' | 103' | 148' | 380' | 148' | 303' | 303' | 35 | 310 | 190' | 120 | 305' |
| 2. Jewell Ave at E-470 Northbound Ramps | | Side-Street Stop | | | | | Signalized | | Signalized | | Signalized | | Signalized | | | | | | | |
| Eastbound Left | 250' | 25' | 20' | Signalize | 175' | 47' | 184' | 106' | 156' | 113' | 91' | 69' | 77' | 67' | 77' | 45 | 435 | 273' | 162 | 273' |
| Eastbound Through | - | 0' | 0' | | 109' | 48' | 250' | 59' | 312' | 77' | 41' | 177' | 54' | 176' | - | - | - | - | - | - |
| Westbound Through | - | 0' | 0' | | 471' | 417' | 683' | 724' | 719' | 811' | 7020' | 450' | 714' | 549' | - | - | - | - | - | - |
| Westbound Right | 250' | 0' | 0' | | 3' | 15' | 13' | 35' | 22' | 40' | 57' | 10' | 60' | 80' | 80' | 45 | 435 | 273' | 162 | 273' |
| Northbound Left+Through | - | 445' | 263' | | 160' | 102' | 181' | 112' | 181' | 115' | 350' | 161' | 350' | 246' | - | - | - | - | - | - |
| Northbound Right | 175' | 8' | 13' | | 0' | 9' | 42' | 25' | 50' | 32' | 149' | 179' | 203' | 314' | 314' | 35 | 310 | 190' | 120 | 315' |
| 3. Gun Club Rd at Jewell Ave | | Signalized | | | | | Signalized | | Signalized | | Signalized | | Signalized | | | | | | | |
| Eastbound Left | 220' | 144' | 163' | Provide overlap phase for EB Right. Increase EBWB Thru phase by 10 sec. by reducing NB/SB Thru phase. | 155' | 151' | 122' | 117' | 122' | 117' | 389' | 389' | 389' | 389' | 389' | 45 | 435 | 273' | 162 | 390' |
| Eastbound Through | - | 374' | 420' | | 255' | 326' | 273' | 364' | 275' | 364' | 438' | 1031' | 438' | 1031' | - | - | - | - | - | - |
| Eastbound Right | 330' | 16' | 58' | | 11' | 60' | 194' | 125' | 404' | 174' | 0' | 0' | 0' | 0' | 0' | 45 | 435 | 273' | 162 | 273' |
| Westbound Left | 300' | 267' | 273' | | 789' | 159' | 173' | 157' | 194' | 173' | 300' | 488' | 327' | 505' | 505' | 45 | 435 | 273' | 162 | 510' |
| Westbound Through | - | 637' | 520' | | 412' | 327' | 402' | 365' | 402' | 365' | 1095' | 792' | 1095' | 792' | - | - | - | - | - | - |
| Westbound Right | - | 0' | 0' | | 0' | 0' | 0' | 0' | 0' | 0' | 396' | 404' | 396' | 404' | 404' | 45 | 435 | 273' | 162 | 400' |
| Northbound Left | 485' | 88' | 98' | | 118' | 243' | 148' | 211' | 169' | 374' | 298' | 203' | 352' | 402' | 402' | 55 | 600 | 378' | 222 | 400' |
| Northbound Through | - | 369' | 445' | | 463' | 532' | 336' | 273' | 273' | 300' | 732' | 590' | 745' | 632' | - | - | - | - | - | - |
| Northbound Right | 360' | 8' | 42' | | 0' | 50' | 47' | 55' | 7' | 57' | 0' | 0' | 0' | 0' | 0' | 55 | 600 | 378' | 222 | 378' |
| Southbound Left | 200' | 22' | 13' | | 29' | 17' | 38' | 17' | 38' | 17' | 277' | 451' | 277' | 451' | 451' | 55 | 600 | 378' | 222 | 450' |
| Southbound Through | - | 376' | 585' | | 451' | 756' | 287' | 453' | 323' | 485' | 420' | 721' | 474' | 736' | - | - | - | - | - | - |
| Southbound Right | 325' | 36' | 35' | | 43' | 42' | 47' | 54' | 47' | 54' | 244' | 189' | 244' | 189' | 244' | 55 | 600 | 378' | 222 | 378' |
| 101. Gun Club Rd at Aspen Business Park Access (3/4 Mvmt) | | | | | | | Side-Street Stop | | Side-Street Stop | | Side-Street Stop | | Side-Street Stop | | | | | | | |
| Eastbound Right | | Future Intersection | | Not Applicable | | | 0' | 5' | 3' | 10' | 0' | 5' | 3' | 10' | 10' | 30 | 250 | 154' | 96 | 154' |
| Northbound Left | | | | | | | 8' | 0' | 13' | 3' | 8' | 0' | 10' | 3' | 10' | 55 | 600 | 378' | 222 | 378' |
| Northbound Through | | | | | | | 0' | 0' | 0' | 0' | 0' | 0' | 0' | 0' | - | - | - | - | - | - |
| Southbound Through | | | | | | | 0' | 0' | 0' | 0' | 0' | 0' | 0' | 0' | - | - | - | - | - | - |
| Southbound Right | | | | | | | 0' | 0' | 0' | 0' | 0' | 0' | 0' | 0' | 0' | 55 | 600 | 378' | 222 | 378' |
| 102. Gun Club Rd at Yale Ave | | | | | | | Signalized | | Signalized | | Signalized | | Signalized | | | | | | | |
| Eastbound Left | | Future Intersection | | Not Applicable | | | 70' | 318' | 70' | 318' | 61' | 333' | 61' | 333' | 333' | 35 | 310 | 190' | 120 | 330' |
| Eastbound Through+Right | | | | | | | 27' | 42' | 28' | 43' | 22' | 42' | 23' | 43' | - | - | - | - | - | - |
| Westbound Left | | | | | | | 77' | 88' | 77' | 88' | 155' | 182' | 155' | 182' | 182' | 35 | 310 | 190' | 120 | 190' |
| Westbound Through+Right | | | | | | | 17' | 13' | 17' | 13' | 89' | 246' | 90' | 246' | 246' | 35 | 310 | 190' | 120 | 250' |
| Northbound Left | | | | | | | 45' | 11' | 48' | 12' | 62' | 18' | 70' | 19' | 70' | 55 | 600 | 378' | 222 | 378' |
| Northbound Through | | | | | | | 318' | 351' | 370' | 370' | 694' | 438' | 761' | 455' | - | - | - | - | - | - |
| Northbound Right | | | | | | | 0' | 0' | 0' | 0' | 52' | 81' | 52' | 87' | 87' | 55 | 600 | 378' | 222 | 378' |
| Southbound Left | | | | | | | 33' | 48' | 36' | 25' | 123' | 244' | 123' | 248' | 248' | 55 | 600 | 378' | 222 | 378' |
| Southbound Through | | | | | | | 377' | 393' | 280' | 510' | 327' | 561' | 336' | 635' | - | - | - | - | - | - |
| Southbound Right | | | | | | | 59' | 0' | 29' | 0' | 35' | 0' | 35' | 0' | 35' | 55 | 600 | 378' | 222 | 378' |

Table 2 - Peak Hour 95th Percentile Queue Summary and Proposed Auxiliary Lanes

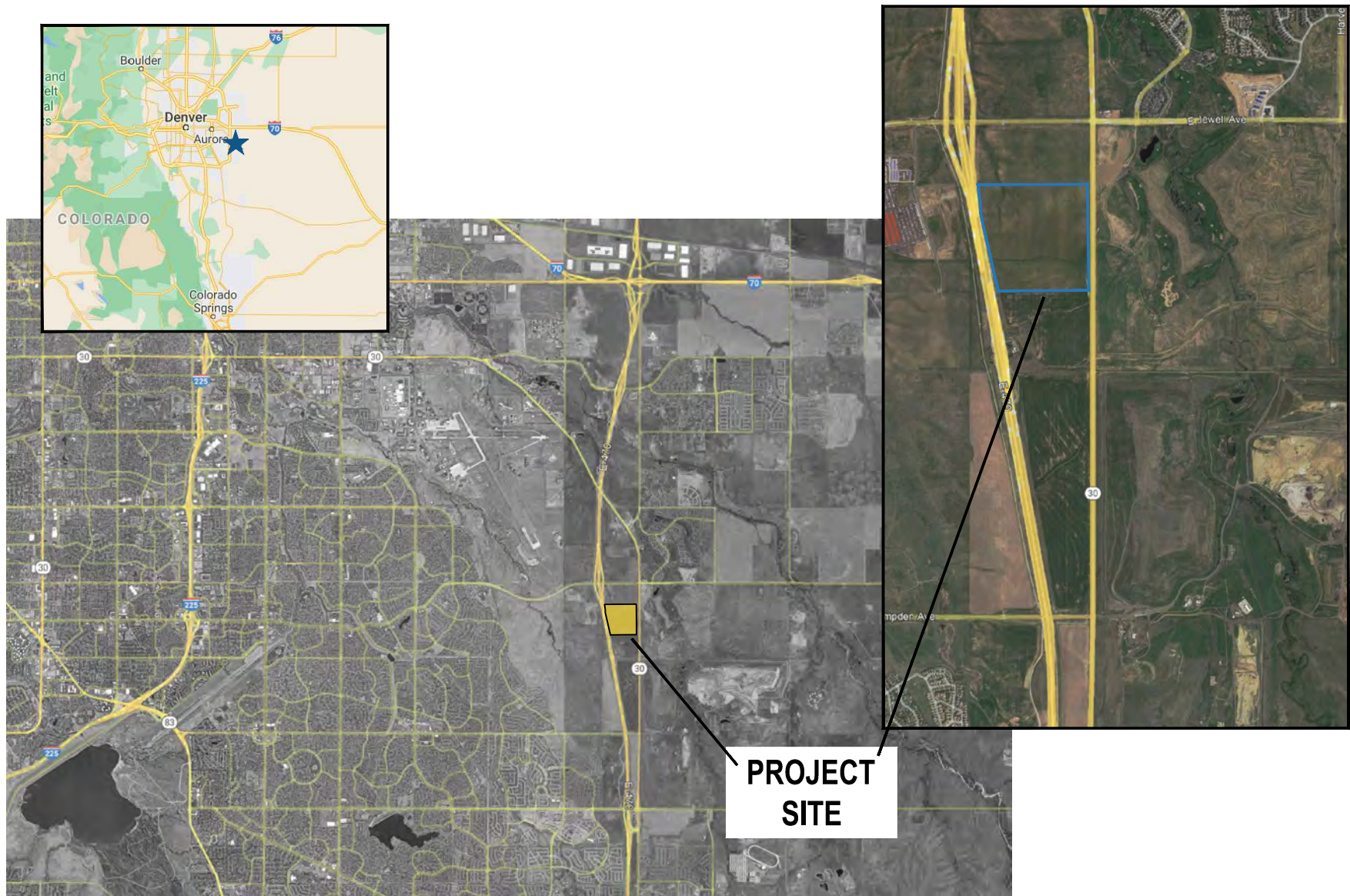
| Intersection and Lanes Groups | Existing Storage Length (Feet) | 2023 Existing | | 2023 Existing with Improvement | | | 2027 Background | | 2027 Bkgrd + Project | | 2050 Background | | 2050 Bkgrd + Project | | Max. Queue | City and CDOT SHAC Requirement (NR-B) | | | | Proposed Minimum Future Storage |
|--|--------------------------------|----------------------|----|--------------------------------|----|----|----------------------|-----|----------------------|------|----------------------|------|----------------------|------|------------|---------------------------------------|--------------|----------------|--------------|---------------------------------|
| | | AM | PM | Imprv. | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | | Speed (mph) | Total (feet) | Storage (feet) | Taper (feet) | |
| 103. Gun Club Rd at Addison Avenue | | | | | | | Side-Street Stop | | Signalized | | Signalized | | Signalized | | | | | | | |
| Eastbound Left | | Future Intersection | | Not Applicable | | | | | 76' | 260' | | | 94' | 337' | 337' | 30 | 250 | 154' | 96 | 340' |
| Eastbound Through+Right | | | | | | | | | 23' | 42' | | | 27' | 48' | - | - | - | - | - | - |
| Westbound Left | | | | | | | 3' | 78' | 11' | 30' | 42' | 104' | 42' | 103' | 103' | 30 | 250 | 154' | 96 | 154' |
| Westbound Right | | | | | | | 3' | 8' | | | 0' | 0' | 6' | 13' | - | - | - | - | - | - |
| Westbound Through+Right | | | | | | | | | 21' | 27' | | | 0' | 0' | - | - | - | - | - | - |
| Northbound Left | | | | | | | | | 29' | 10' | | | 39' | 22' | 39' | 55 | 600 | 378' | 222 | 378' |
| Northbound Through | | | | | | | 0' | 0' | 287' | 247' | 304' | 324' | 569' | 589' | - | - | - | - | - | - |
| Northbound Right | | | | | | | 0' | 0' | 0' | 0' | 11' | 15' | 0' | 0' | - | - | - | - | - | - |
| Southbound Left | | | | | | | 3' | 8' | 12' | 19' | 45' | 87' | 65' | 116' | 116' | 55 | 600 | 378' | 222 | 378' |
| Southbound Through | | | | | | | 0' | 0' | 361' | 528' | 99' | 196' | 378' | 623' | 623' | 55 | 600 | 378' | 222 | 620' |
| Southbound Right | | | | | | | | | 34' | 0' | | | 36' | 0' | 36' | 55 | 600 | 378' | 222 | 378' |
| 104. Gun Club Rd at North Access [3/4 Mvmt] | | | | | | | | | Side-Street Stop | | | | Side-Street Stop | | | | | | | |
| Eastbound Right | | Project Intersection | | Not Applicable | | | Project Intersection | | 3' | 5' | Project Intersection | | 3' | 20' | 20' | 30 | 250 | 154' | 96 | 154' |
| Northbound Left | | | | | | | | | 5' | 3' | | | 23' | 20' | 23' | 55 | 600 | 378' | 222 | 378' |
| Northbound Through | | | | | | | | | 0' | 0' | | | 0' | 0' | - | - | - | - | - | - |
| Southbound Through | | | | | | | | | 0' | 0' | | | 0' | 0' | - | - | - | - | - | - |
| Southbound Right | | | | | | | | | 0' | 0' | | | 0' | 0' | 0' | 55 | 600 | 378' | 222 | 378' |

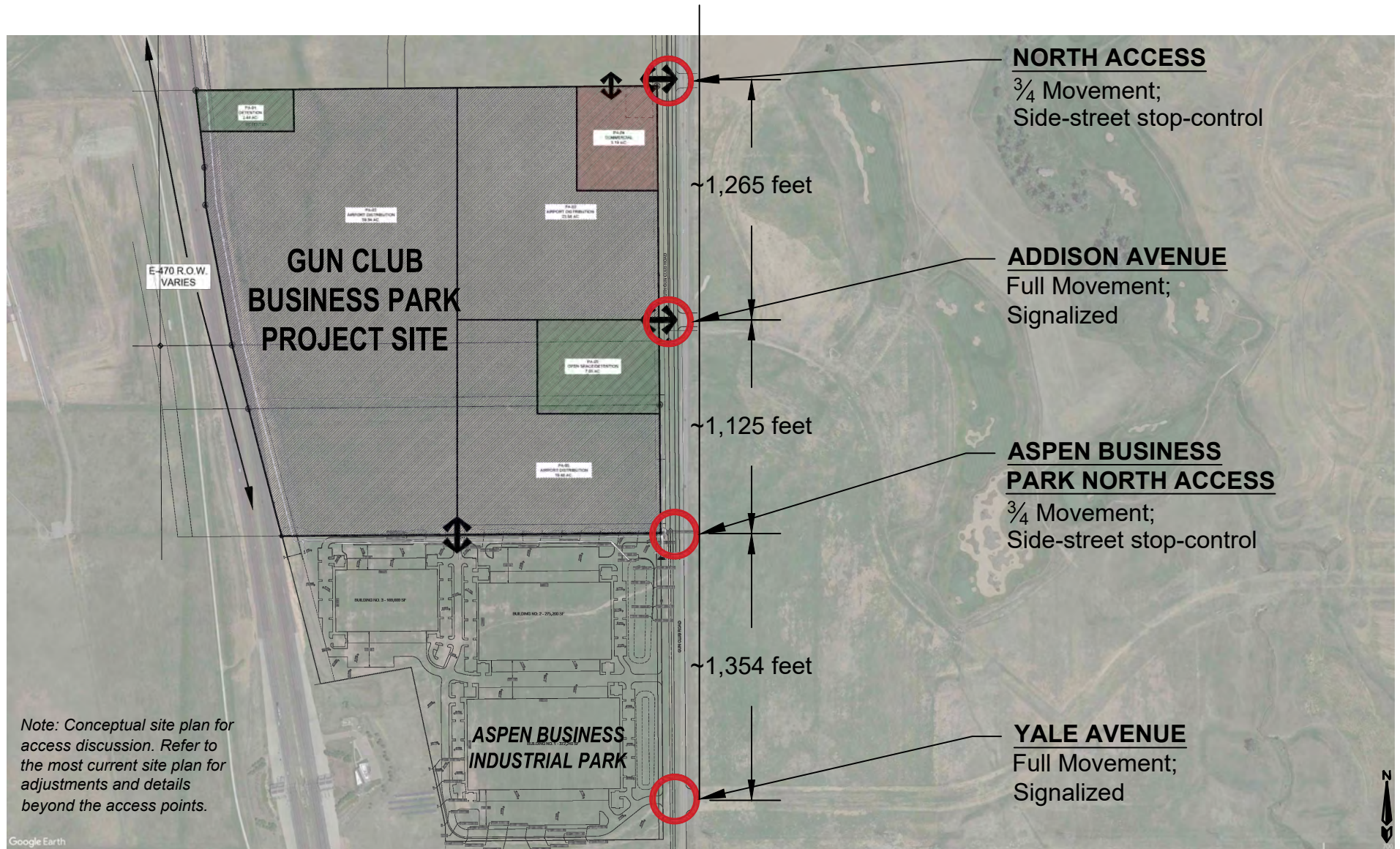
Table 3 - Trip Generation Summary

| Land Use | Size | Unit | Internal Capture | | Non-Auto Factor | Average Daily Trips | | | | AM Peak Hour Trips | | | | PM Peak Hour Trips | | | |
|---|---------|------|------------------|------|-----------------|---------------------|--------------|--------------|--------------|--------------------|------------|------------|------------|--------------------|------------|------------|------------|
| | | | AM | PM | | Rate | Total | In | Out | Rate | Total | In | Out | Rate | Total | In | Out |
| ITE#130: Industrial Park | 1,466.2 | ksf | 0.99 | 0.92 | 0.95 | 3.37 | 4,318 | 2,159 | 2,159 | 0.34 | 469 | 380 | 89 | 0.34 | 436 | 96 | 340 |
| ITE#822: Strip Retail Plaza (<40k) | 13.0 | ksf | 0.99 | 0.92 | 0.95 | 54.45 | 619 | 310 | 309 | 2.36 | 29 | 17 | 12 | 6.59 | 75 | 38 | 37 |
| ITE#930: Fast Casual Restaurant | 6.5 | ksf | 0.99 | 0.92 | 0.95 | 97.14 | 552 | 276 | 276 | 1.43 | 9 | 5 | 4 | 12.55 | 71 | 39 | 32 |
| <i>Subtotal</i> | | | | | | | 5,489 | 2,745 | 2,744 | | 507 | 402 | 105 | | 582 | 173 | 409 |
| <i>Pass-by Trips: Retail (PM) 40%</i> | | | | | | | 248 | 124 | 124 | | 0 | 0 | 0 | | 30 | 15 | 15 |
| <i>Pass-by Trips: Restaurant (PM) 43%</i> | | | | | | | 237 | 119 | 118 | | 0 | 0 | 0 | | 31 | 17 | 14 |
| Total New Vehicle Trips | | | | | | | 5,004 | 2,502 | 2,502 | | 507 | 402 | 105 | | 521 | 141 | 380 |

Source : ITE Trip Generation 11th Edition, 2021.

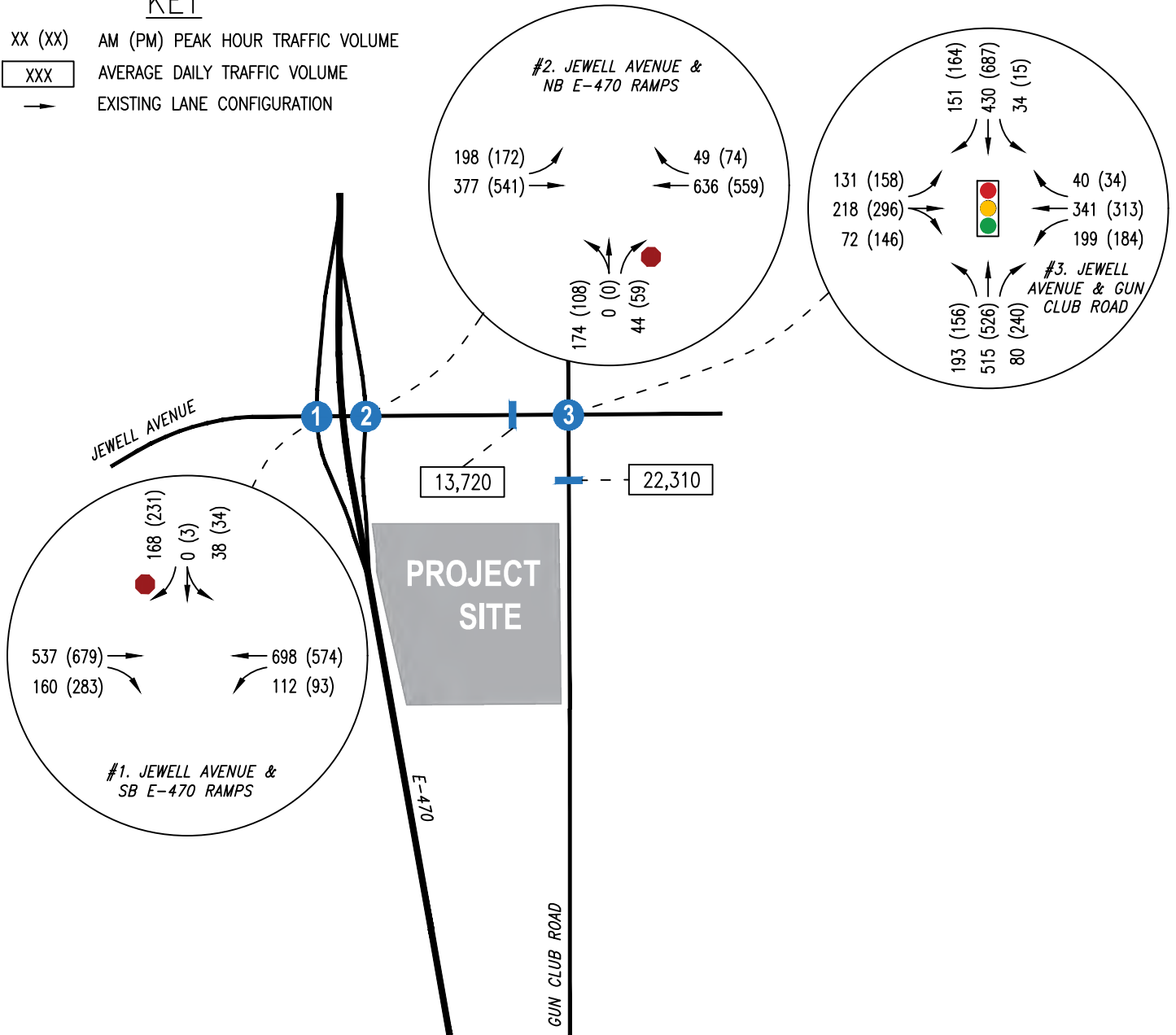
| | | | | | | | | | | | | |
|---|------|-------|-------|-------|------|-----|-----|-----|------|-----|-----|-----|
| <i>Industrial Trucks (ITE)</i> | 0.25 | 320 | 160 | 160 | 0.01 | 13 | 8 | 5 | 0.01 | 13 | 7 | 6 |
| <i>Passenger Cars (Total Vehicles minus Trucks)</i> | 7% | 4,684 | 2,342 | 2,342 | 3% | 494 | 394 | 100 | 3% | 508 | 134 | 374 |





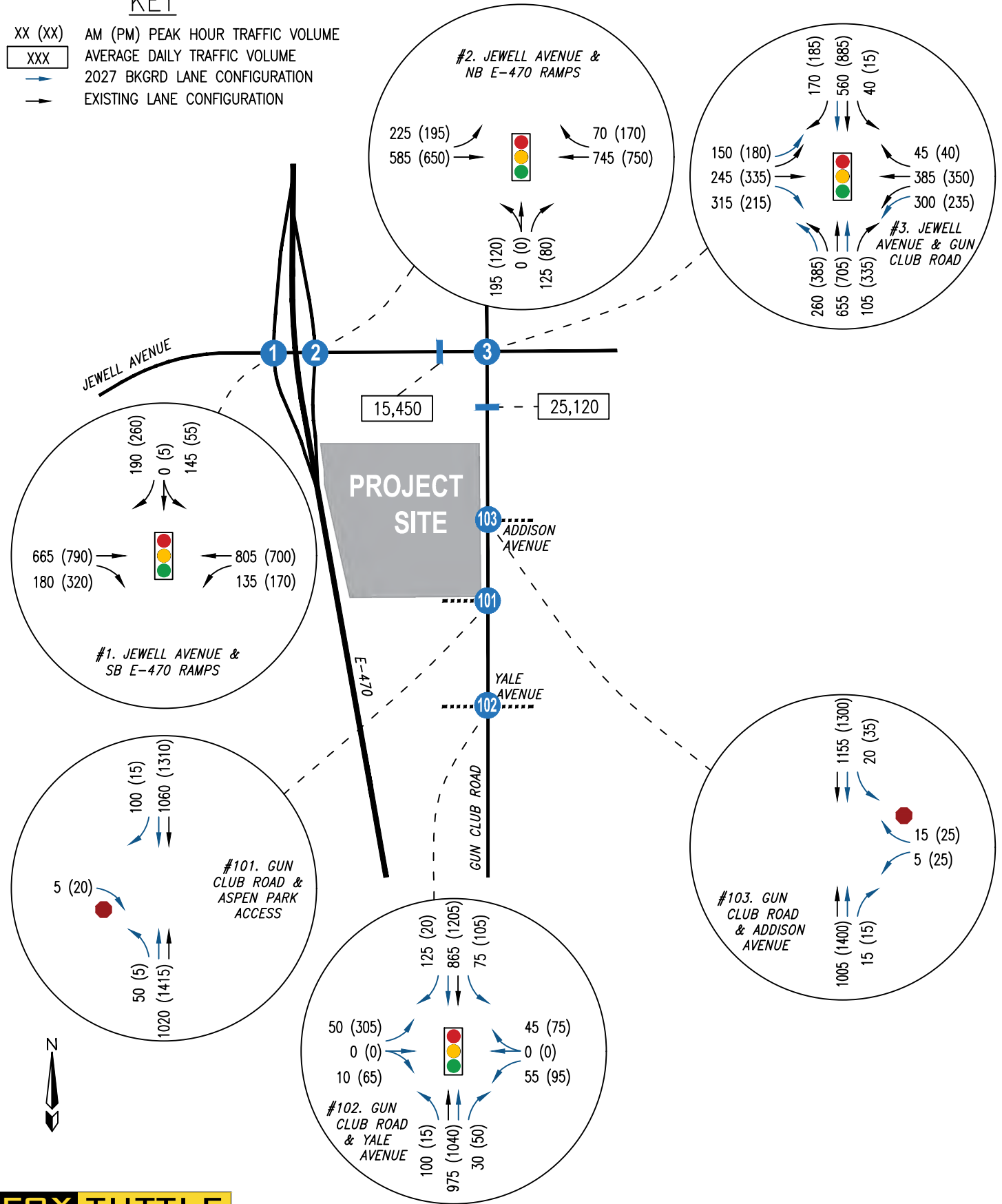
KEY

XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUME
 XXX AVERAGE DAILY TRAFFIC VOLUME
 → EXISTING LANE CONFIGURATION



KEY

- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUME
- XXX AVERAGE DAILY TRAFFIC VOLUME
- 2027 BKGRD LANE CONFIGURATION
- EXISTING LANE CONFIGURATION

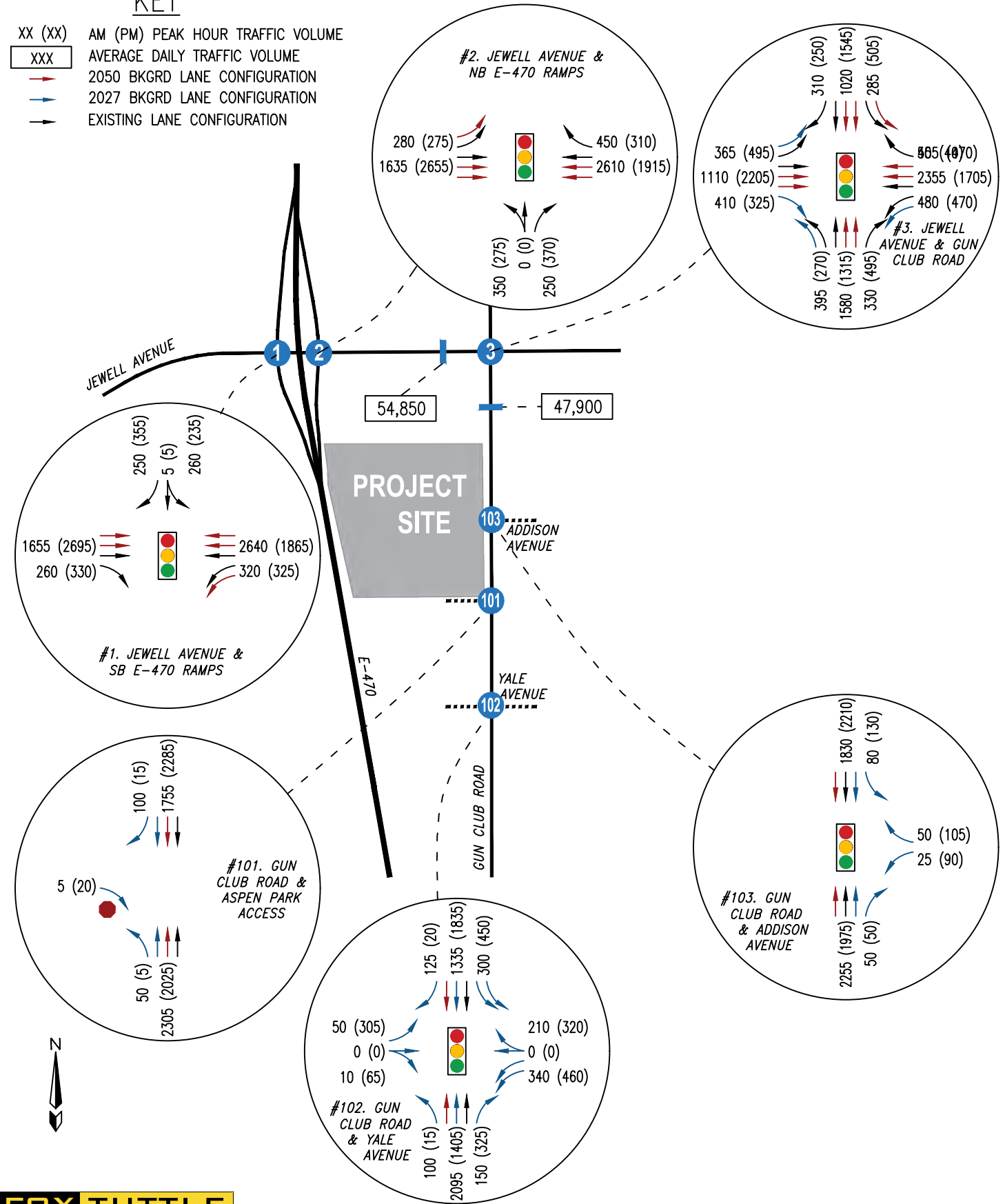


GUN CLUB BUSINESS PARK TRAFFIC IMPACT STUDY - AURORA, CO YEAR 2027 BACKGROUND TRAFFIC VOLUMES

| | | | | | | | | | |
|------|-------|----------------|-----|------|-----------|----------|-----|----------|---|
| FT # | 23087 | Original Scale | NTS | Date | 2/22/2024 | Drawn by | CRS | Figure # | 4 |
|------|-------|----------------|-----|------|-----------|----------|-----|----------|---|

KEY

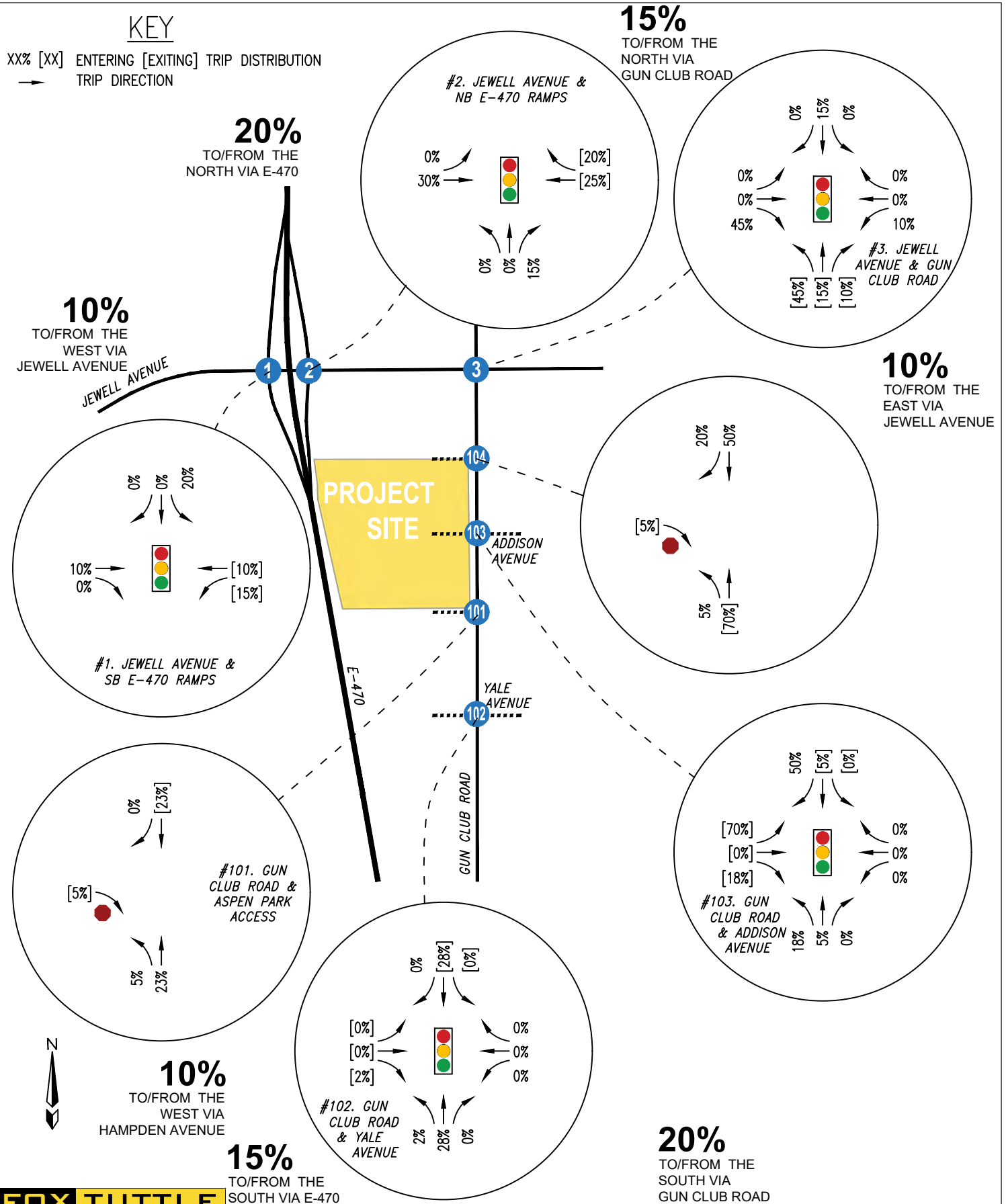
- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUME
 XXX AVERAGE DAILY TRAFFIC VOLUME
 — 2050 BKG RD LANE CONFIGURATION
 — 2027 BKG RD LANE CONFIGURATION
 — EXISTING LANE CONFIGURATION



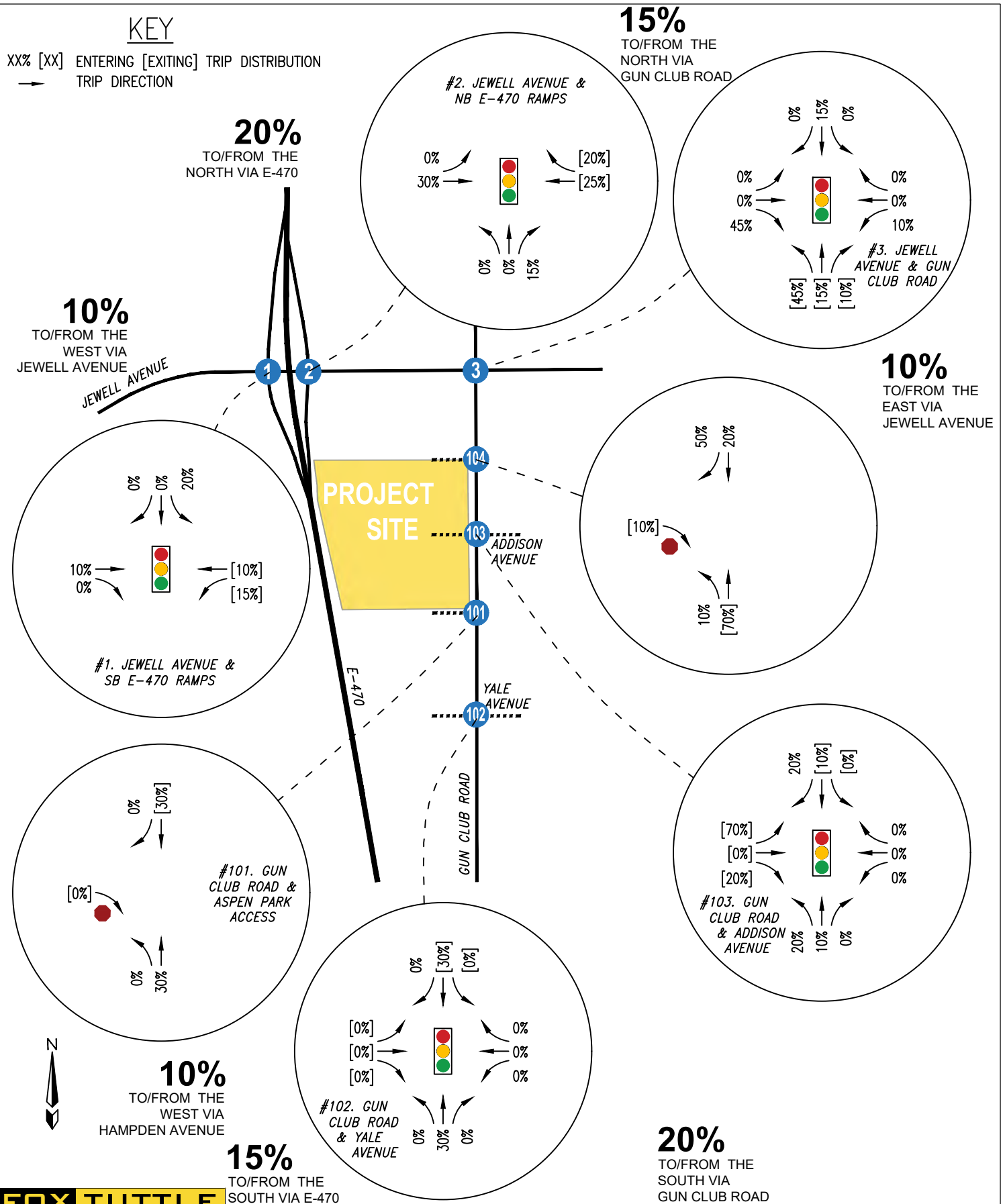
GUN CLUB BUSINESS PARK TRAFFIC IMPACT STUDY - AURORA, CO YEAR 2050 BACKGROUND TRAFFIC VOLUMES

| | | | | | | | | | |
|------|-------|----------------|-----|------|-----------|----------|-----|----------|---|
| FT # | 23087 | Original Scale | NTS | Date | 2/22/2024 | Drawn by | CRS | Figure # | 5 |
|------|-------|----------------|-----|------|-----------|----------|-----|----------|---|

KEY
 XX% [XX] ENTERING [EXITING] TRIP DISTRIBUTION
 → TRIP DIRECTION

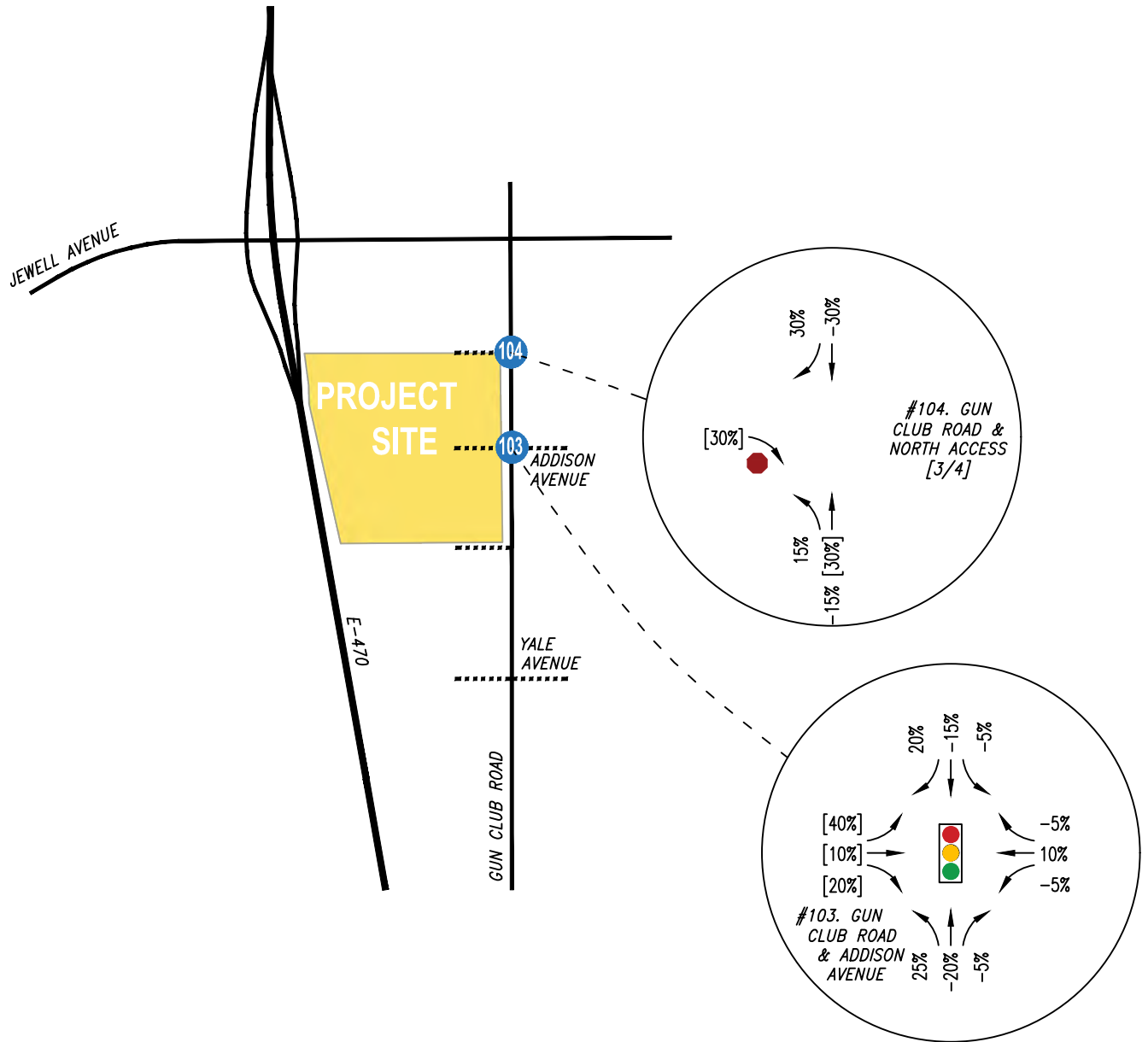


KEY
 XX% [XX] ENTERING [EXITING] TRIP DISTRIBUTION
 → TRIP DIRECTION



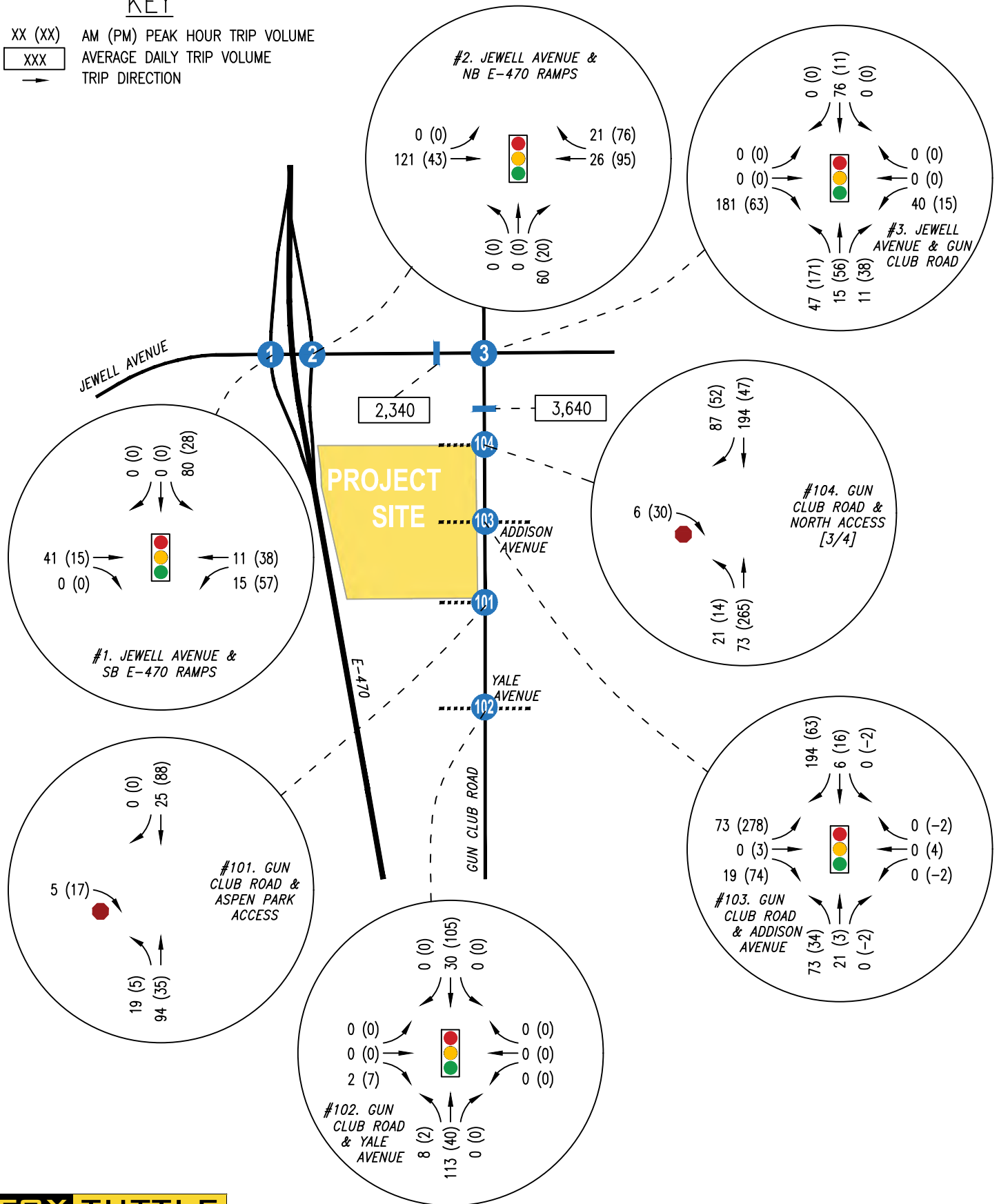
KEY

XX% [XX] ENTERING [EXITING] TRIP DISTRIBUTION
 → TRIP DIRECTION






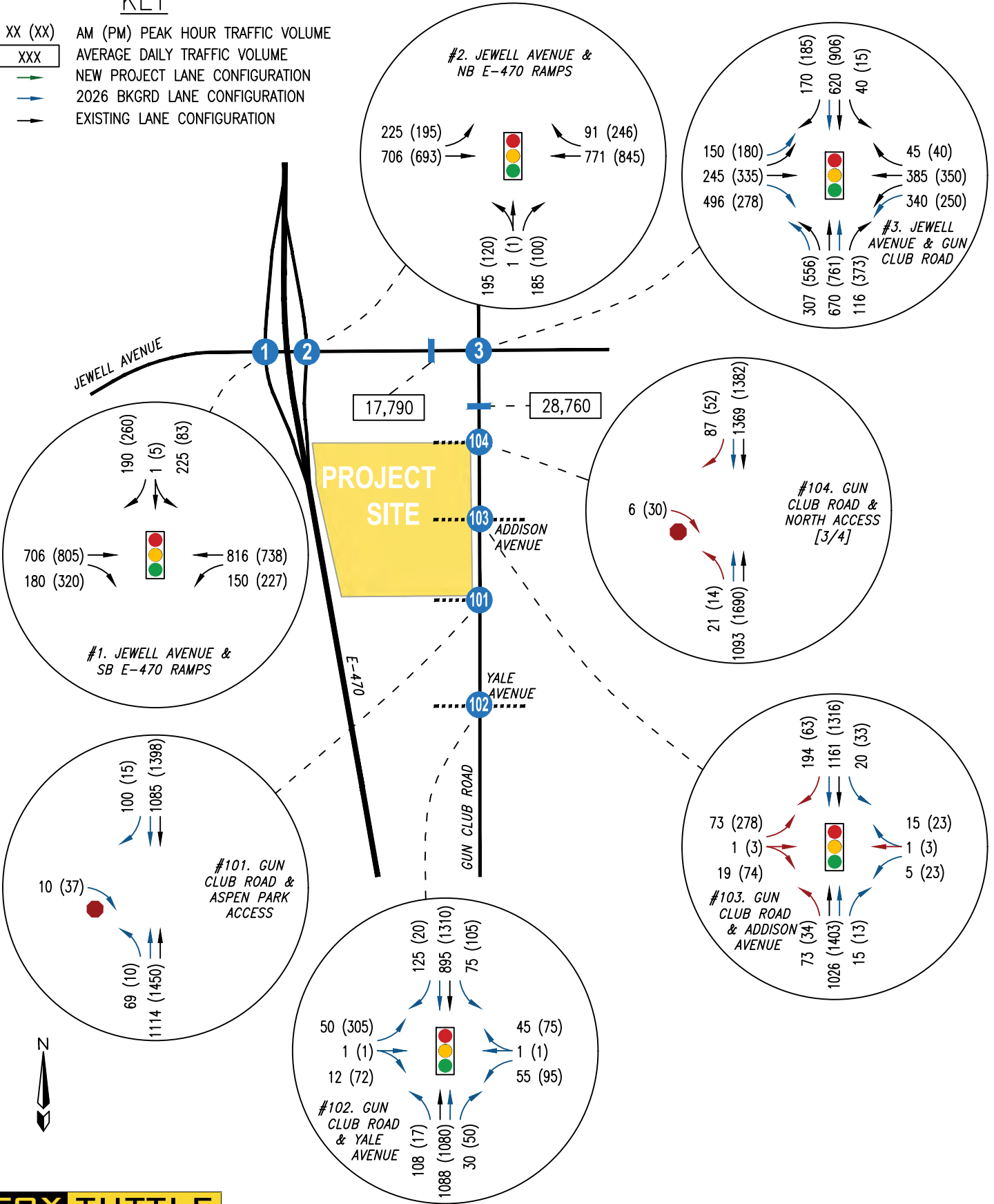
KEY

XX (XX) AM (PM) PEAK HOUR TRIP VOLUME
 XXX AVERAGE DAILY TRIP VOLUME
 → TRIP DIRECTION



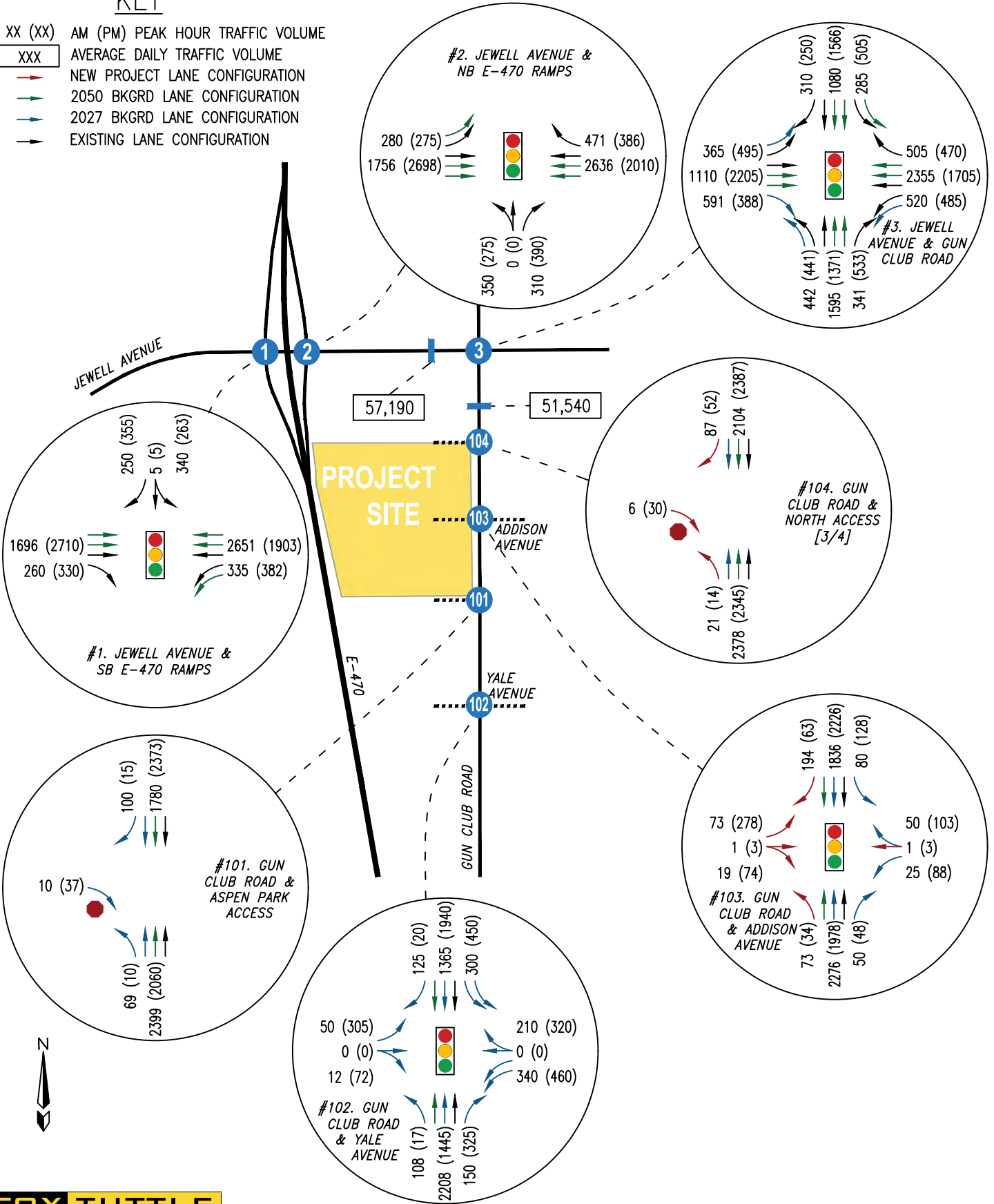
KEY

- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUME
 XXX AVERAGE DAILY TRAFFIC VOLUME
 NEW PROJECT LANE CONFIGURATION
 2026 BKG RD LANE CONFIGURATION
 EXISTING LANE CONFIGURATION



KEY

- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUME
- XXX AVERAGE DAILY TRAFFIC VOLUME
- NEW PROJECT LANE CONFIGURATION
- 2050 BKGRD LANE CONFIGURATION
- 2027 BKGRD LANE CONFIGURATION
- EXISTING LANE CONFIGURATION



Appendix:

Level of Service Definitions

Existing Traffic Data

Background Documentation

Intersection Capacity Worksheets

Signal Warrant Worksheets

Internal Capture and Pass-By Calculations

Sensitivity Analysis

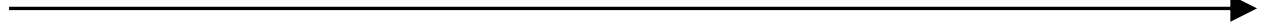
Level of Service Definitions

LEVEL OF SERVICE DEFINITIONS

In rating roadway and intersection operating conditions with existing or future traffic volumes, “Levels of Service” (LOS) A through F are used, with LOS A indicating very good operation and LOS F indicating poor operation. Levels of service at signalized and unsignalized intersections are closely associated with vehicle delays experienced in seconds per vehicle. More complete level of service definitions and delay data for signal and stop sign controlled intersections are contained in the following table for reference.

| Level of Service Rating | Delay in seconds per vehicle (a) | | Definition |
|-------------------------|----------------------------------|--------------|--|
| | Signalized | Unsignalized | |
| A | 0.0 to 10.0 | 0.0 to 10.0 | Low vehicular traffic volumes; primarily free flow operations. Density is low and vehicles can freely maneuver within the traffic stream. Drivers are able to maintain their desired speeds with little or no delay. |
| B | 10.1 to 20.0 | 10.1 to 15.0 | Stable vehicular traffic volume flow with potential for some restriction of operating speeds due to traffic conditions. Vehicle maneuvering is only slightly restricted. The stopped delays are not bothersome and drivers are not subject to appreciable tension. |
| C | 20.1 to 35.0 | 15.1 to 25.0 | Stable traffic operations, however the ability for vehicles to maneuver is more restricted by the increase in traffic volumes. Relatively satisfactory operating speeds prevail, but adverse signal coordination or longer vehicle queues cause delays along the corridor. |
| D | 35.1 to 55.0 | 25.1 to 35.0 | Approaching unstable vehicular traffic flow where small increases in volume could cause substantial delays. Most drivers are restricted in ability to maneuver and selection of travel speeds due to congestion. Driver comfort and convenience are low, but tolerable. |
| E | 55.1 to 80.0 | 35.1 to 50.0 | Traffic operations characterized by significant approach delays and average travel speeds of one-half to one-third the free flow speed. Vehicular flow is unstable and there is potential for stoppages of brief duration. High signal density, extensive vehicle queuing, or corridor signal progression/timing are the typical causes of vehicle delays at signalized corridors. |
| F | > 80.0 | > 50.0 | Forced vehicular traffic flow and operations with high approach delays at critical intersections. Vehicle speeds are reduced substantially, and stoppages may occur for short or long periods of time because of downstream congestion. |

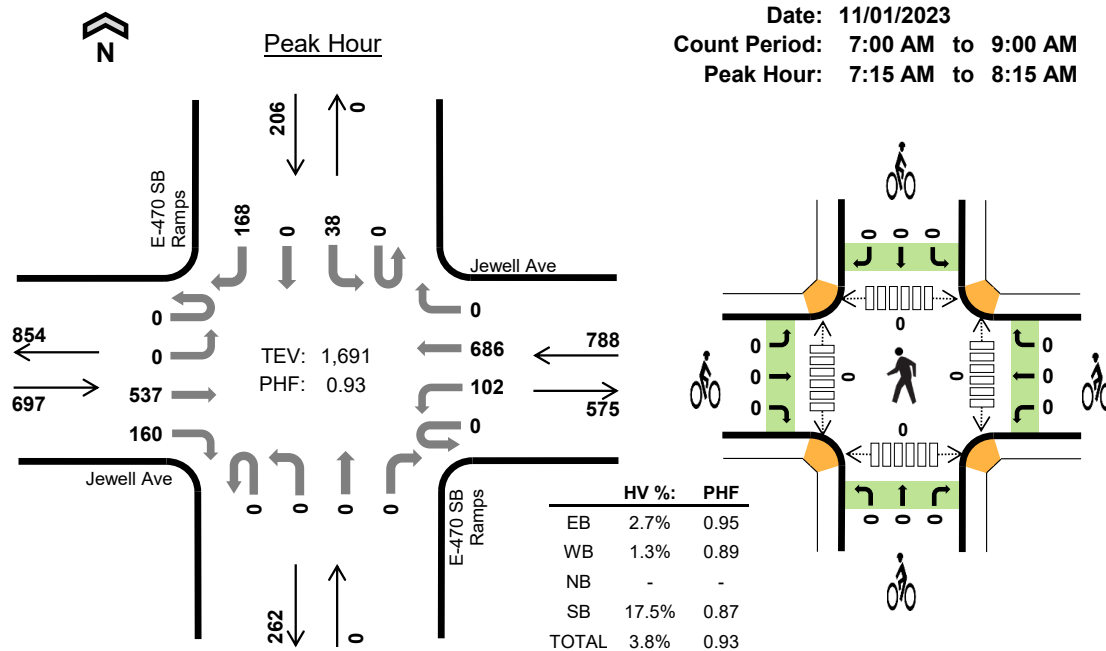
(a) Delay ranges based on Highway Capacity Manual (6th Edition, 2016) criteria.



Existing Traffic Data



E-470 SB Ramps Jewell Ave



Two-Hour Count Summaries

| Interval Start | | Jewell Ave | | | | Jewell Ave | | | | E-470 SB Ramps | | | | E-470 SB Ramps | | | | 15-min Total | Rolling One Hour |
|----------------|---------|------------|----|-----|-----|------------|-----|-------|----|----------------|----|----|----|----------------|-----|----|-----|--------------|------------------|
| | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | | |
| | | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | | |
| | 7:00 AM | 0 | 0 | 117 | 13 | 0 | 11 | 164 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 38 | 351 | 0 |
| | 7:15 AM | 0 | 0 | 144 | 22 | 0 | 21 | 167 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 41 | 404 | 0 |
| | 7:30 AM | 0 | 0 | 137 | 47 | 0 | 30 | 192 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 42 | 457 | 0 |
| | 7:45 AM | 0 | 0 | 129 | 53 | 0 | 30 | 183 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 50 | 454 | 1,666 |
| | 8:00 AM | 0 | 0 | 127 | 38 | 0 | 21 | 144 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 35 | 376 | 1,691 |
| | 8:15 AM | 0 | 0 | 117 | 40 | 0 | 43 | 140 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 34 | 380 | 1,667 |
| | 8:30 AM | 0 | 0 | 107 | 41 | 0 | 36 | 142 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 1 | 25 | 362 | 1,572 |
| | 8:45 AM | 0 | 0 | 96 | 30 | 0 | 36 | 125 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 24 | 320 | 1,438 |
| Count Total | | 0 | 0 | 974 | 284 | 0 | 228 | 1,257 | 0 | 0 | 0 | 0 | 0 | 0 | 70 | 2 | 289 | 3,104 | 0 |
| Peak Hour | All | 0 | 0 | 537 | 160 | 0 | 102 | 686 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 0 | 168 | 1,691 | 0 |
| | HV | 0 | 0 | 10 | 9 | 0 | 2 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 14 | 65 | 0 |
| | HV% | - | - | 2% | 6% | - | 2% | 1% | - | - | - | - | - | - | 58% | - | 8% | 4% | 0 |

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

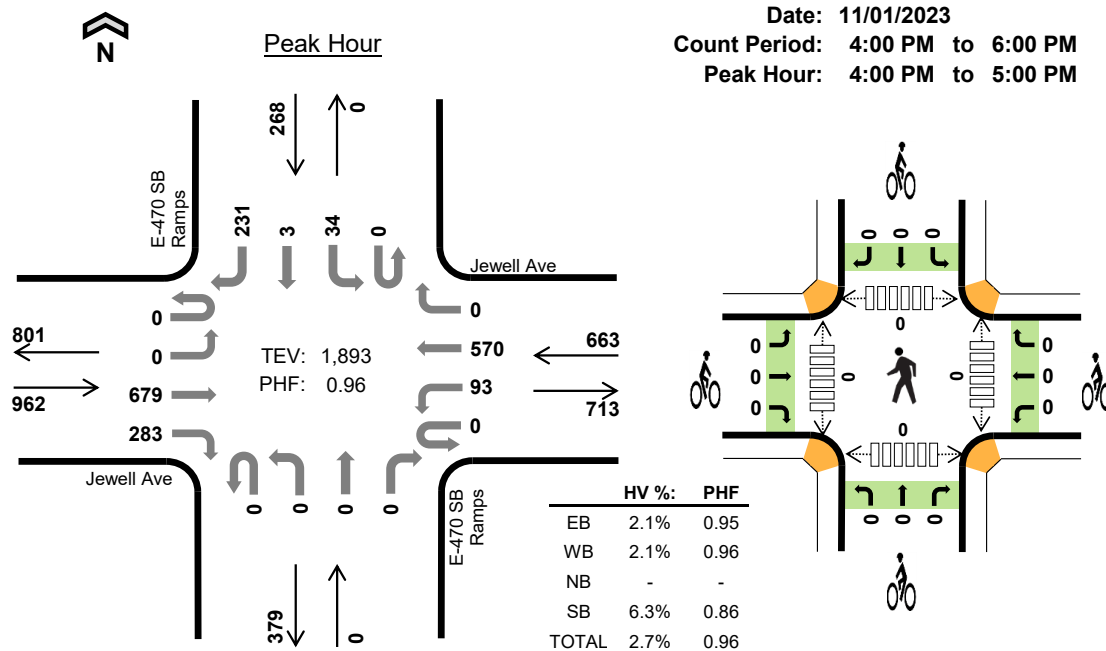
| Interval Start | Heavy Vehicle Totals | | | | | Bicycles | | | | | Pedestrians (Crossing Leg) | | | | |
|----------------|----------------------|----|----|----|-------|----------|----|----|----|-------|----------------------------|------|-------|-------|-------|
| | EB | WB | NB | SB | Total | EB | WB | NB | SB | Total | East | West | North | South | Total |
| 7:00 AM | 3 | 2 | 0 | 19 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 4 | 2 | 0 | 7 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 3 | 5 | 0 | 7 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 5 | 2 | 0 | 9 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 7 | 1 | 0 | 13 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 10 | 4 | 0 | 3 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 3 | 4 | 0 | 7 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 6 | 6 | 0 | 4 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Count Total | 41 | 26 | 0 | 69 | 136 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Peak Hour | 19 | 10 | 0 | 36 | 65 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Two-Hour Count Summaries - Heavy Vehicles | | | | | | | | | | | | | | | | | | |
|---|------------|----|----|----|------------|----|----|----|----------------|----|----|----|----------------|----|----|----|--------------|------------------|
| Interval Start | Jewell Ave | | | | Jewell Ave | | | | E-470 SB Ramps | | | | E-470 SB Ramps | | | | 15-min Total | Rolling One Hour |
| | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | | |
| | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | | |
| 7:00 AM | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 16 | 24 | 0 |
| 7:15 AM | 0 | 0 | 3 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 1 | 13 | 0 |
| 7:30 AM | 0 | 0 | 2 | 1 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 2 | 15 | 0 |
| 7:45 AM | 0 | 0 | 1 | 4 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 4 | 16 | 68 |
| 8:00 AM | 0 | 0 | 4 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 7 | 21 | 65 |
| 8:15 AM | 0 | 0 | 7 | 3 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 17 | 69 |
| 8:30 AM | 0 | 0 | 2 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 3 | 14 | 68 |
| 8:45 AM | 0 | 0 | 6 | 0 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 16 | 68 |
| Count Total | 0 | 0 | 27 | 14 | 0 | 6 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 0 | 35 | 136 | 0 |
| Peak Hour | 0 | 0 | 10 | 9 | 0 | 2 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 14 | 65 | 0 |

| Two-Hour Count Summaries - Bikes | | | | | | | | | | | | | | | | | | |
|----------------------------------|------------|----|----|------------|----|----|----------------|----|----|----------------|----|----|--------------|------------------|---|--|--|--|
| Interval Start | Jewell Ave | | | Jewell Ave | | | E-470 SB Ramps | | | E-470 SB Ramps | | | 15-min Total | Rolling One Hour | | | | |
| | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | | | | | | |
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT | | | | | | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Count Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Peak Hour | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

E-470 SB Ramps Jewell Ave



Two-Hour Count Summaries

| Interval Start | | Jewell Ave | | | | Jewell Ave | | | | E-470 SB Ramps | | | | E-470 SB Ramps | | | | 15-min Total | Rolling One Hour |
|----------------|---------|------------|----|-------|-----|------------|-----|-------|----|----------------|----|----|----|----------------|-----|----|-----|--------------|------------------|
| | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | | |
| | | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | | |
| | 4:00 PM | 0 | 0 | 177 | 62 | 0 | 24 | 146 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 54 | 471 | 0 |
| | 4:15 PM | 0 | 0 | 153 | 73 | 0 | 24 | 134 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 1 | 54 | 447 | 0 |
| | 4:30 PM | 0 | 0 | 165 | 78 | 0 | 21 | 141 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 1 | 65 | 483 | 0 |
| | 4:45 PM | 0 | 0 | 184 | 70 | 0 | 24 | 149 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 58 | 492 | 1,893 |
| | 5:00 PM | 0 | 0 | 151 | 61 | 0 | 18 | 130 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 80 | 443 | 1,865 |
| | 5:15 PM | 0 | 0 | 148 | 49 | 0 | 21 | 136 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 52 | 416 | 1,834 |
| | 5:30 PM | 0 | 0 | 145 | 42 | 0 | 13 | 147 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 63 | 421 | 1,772 |
| | 5:45 PM | 0 | 0 | 148 | 35 | 0 | 12 | 147 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 42 | 395 | 1,675 |
| Count Total | | 0 | 0 | 1,271 | 470 | 0 | 157 | 1,130 | 0 | 0 | 0 | 0 | 0 | 0 | 69 | 3 | 468 | 3,568 | 0 |
| Peak Hour | All | 0 | 0 | 679 | 283 | 0 | 93 | 570 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 3 | 231 | 1,893 | 0 |
| | HV | 0 | 0 | 16 | 4 | 0 | 3 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 5 | 51 | 0 |
| | HV% | - | - | 2% | 1% | - | 3% | 2% | - | - | - | - | - | - | 35% | 0% | 2% | 3% | 0 |

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

| Interval Start | Heavy Vehicle Totals | | | | | Bicycles | | | | | Pedestrians (Crossing Leg) | | | | |
|----------------|----------------------|----|----|----|-------|----------|----|----|----|-------|----------------------------|------|-------|-------|-------|
| | EB | WB | NB | SB | Total | EB | WB | NB | SB | Total | East | West | North | South | Total |
| 4:00 PM | 7 | 4 | 0 | 1 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 2 | 2 | 0 | 5 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 5 | 4 | 0 | 9 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 6 | 4 | 0 | 2 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 4 | 4 | 0 | 6 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 1 | 3 | 0 | 4 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 4 | 0 | 0 | 3 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 3 | 0 | 5 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Count Total | 29 | 24 | 0 | 35 | 88 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Peak Hour | 20 | 14 | 0 | 17 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Two-Hour Count Summaries - Heavy Vehicles | | | | | | | | | | | | | | | | | | |
|---|------------|----|----|----|------------|----|----|----|----------------|----|----|----|----------------|----|----|----|--------------|------------------|
| Interval Start | Jewell Ave | | | | Jewell Ave | | | | E-470 SB Ramps | | | | E-470 SB Ramps | | | | 15-min Total | Rolling One Hour |
| | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | | |
| | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | | |
| 4:00 PM | 0 | 0 | 5 | 2 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 12 | 0 |
| 4:15 PM | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 9 | 0 |
| 4:30 PM | 0 | 0 | 5 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 18 | 0 |
| 4:45 PM | 0 | 0 | 4 | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 12 | 51 |
| 5:00 PM | 0 | 0 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 53 |
| 5:15 PM | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 8 | 52 |
| 5:30 PM | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 7 | 41 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 8 | 37 |
| Count Total | 0 | 0 | 20 | 9 | 0 | 4 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 88 | 0 |
| Peak Hour | 0 | 0 | 16 | 4 | 0 | 3 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 51 | 0 |

| Two-Hour Count Summaries - Bikes | | | | | | | | | | | | | | | | | | |
|----------------------------------|------------|----|----|------------|----|----|----------------|----|----|----------------|----|----|--------------|------------------|--|--|--|--|
| Interval Start | Jewell Ave | | | Jewell Ave | | | E-470 SB Ramps | | | E-470 SB Ramps | | | 15-min Total | Rolling One Hour | | | | |
| | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | | | | | | |
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT | | | | | | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Count Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Peak Hour | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |

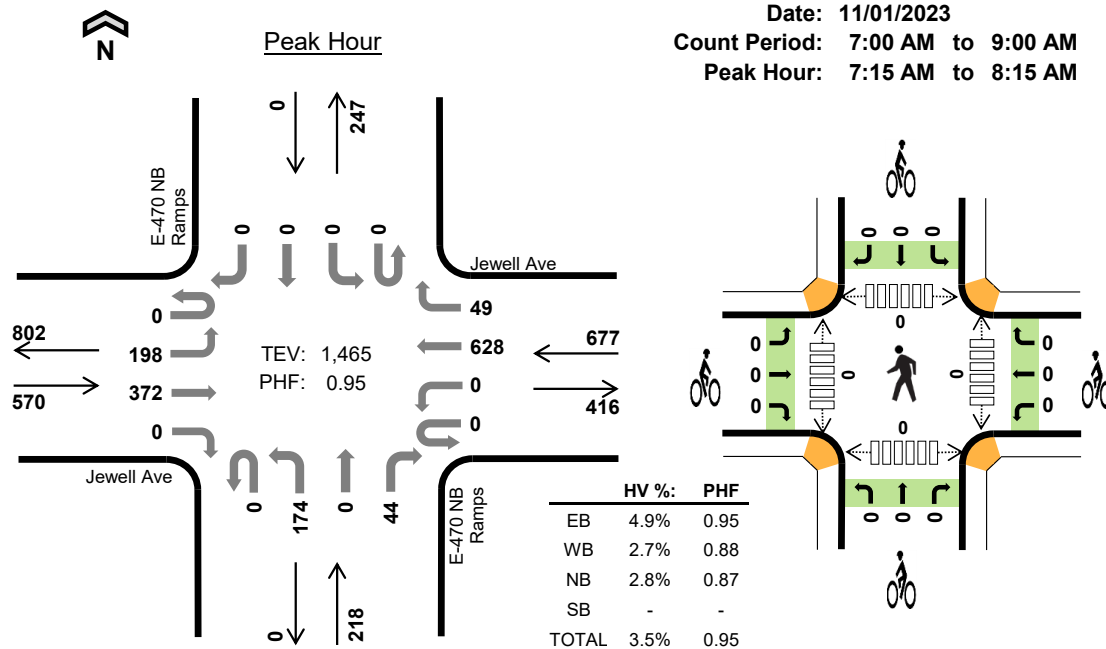
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

E-470 NB Ramps Jewell Ave

Date: 11/01/2023

Count Period: 7:00 AM to 9:00 AM

Peak Hour: 7:15 AM to 8:15 AM



Two-Hour Count Summaries

| Interval Start | | Jewell Ave | | | | Jewell Ave | | | | E-470 NB Ramps | | | | E-470 NB Ramps | | | | 15-min Total | Rolling One Hour |
|----------------|-----|------------|-----|-----|----|------------|----|-------|-----|----------------|-----|----|-----|----------------|----|----|----|--------------|------------------|
| | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | | |
| | | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | | |
| 7:00 AM | | 0 | 38 | 83 | 0 | 0 | 0 | 138 | 13 | 0 | 36 | 0 | 17 | 0 | 0 | 0 | 0 | 325 | 0 |
| 7:15 AM | | 0 | 56 | 94 | 0 | 0 | 0 | 147 | 23 | 0 | 40 | 0 | 6 | 0 | 0 | 0 | 0 | 366 | 0 |
| 7:30 AM | | 0 | 43 | 96 | 0 | 0 | 0 | 182 | 11 | 0 | 45 | 0 | 8 | 0 | 0 | 0 | 0 | 385 | 0 |
| 7:45 AM | | 0 | 60 | 82 | 0 | 0 | 0 | 171 | 9 | 0 | 48 | 0 | 15 | 0 | 0 | 0 | 0 | 385 | 1,461 |
| 8:00 AM | | 0 | 39 | 100 | 0 | 0 | 0 | 128 | 6 | 0 | 41 | 0 | 15 | 0 | 0 | 0 | 0 | 329 | 1,465 |
| 8:15 AM | | 0 | 36 | 94 | 0 | 0 | 0 | 153 | 6 | 0 | 30 | 0 | 9 | 0 | 0 | 0 | 0 | 328 | 1,427 |
| 8:30 AM | | 0 | 37 | 85 | 0 | 0 | 0 | 134 | 13 | 0 | 39 | 0 | 9 | 0 | 0 | 0 | 0 | 317 | 1,359 |
| 8:45 AM | | 0 | 27 | 75 | 0 | 0 | 0 | 125 | 3 | 0 | 29 | 0 | 11 | 0 | 0 | 0 | 0 | 270 | 1,244 |
| Count Total | | 0 | 336 | 709 | 0 | 0 | 0 | 1,178 | 84 | 0 | 308 | 0 | 90 | 0 | 0 | 0 | 0 | 2,705 | 0 |
| Peak Hour | All | 0 | 198 | 372 | 0 | 0 | 0 | 628 | 49 | 0 | 174 | 0 | 44 | 0 | 0 | 0 | 0 | 1,465 | 0 |
| | HV | 0 | 2 | 26 | 0 | 0 | 0 | 9 | 9 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 52 | 0 |
| | HV% | - | 1% | 7% | - | - | - | 1% | 18% | - | 1% | - | 11% | - | - | - | - | 4% | 0 |

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

[illegible]

| Two-Hour Count Summaries - Heavy Vehicles | | | | | | | | | | | | | | | | | | |
|---|------------|----|----|----|------------|----|----|----|----------------|----|----|----|----------------|----|----|----|--------------|------------------|
| Interval Start | Jewell Ave | | | | Jewell Ave | | | | E-470 NB Ramps | | | | E-470 NB Ramps | | | | 15-min Total | Rolling One Hour |
| | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | | |
| | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | | |
| 7:00 AM | 0 | 3 | 4 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 |
| 7:15 AM | 0 | 2 | 6 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 17 | 0 |
| 7:30 AM | 0 | 0 | 7 | 0 | 0 | 0 | 5 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 14 | 0 |
| 7:45 AM | 0 | 0 | 6 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 9 | 51 |
| 8:00 AM | 0 | 0 | 7 | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 52 |
| 8:15 AM | 0 | 2 | 9 | 0 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 17 | 52 |
| 8:30 AM | 0 | 1 | 5 | 0 | 0 | 0 | 3 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 13 | 51 |
| 8:45 AM | 0 | 1 | 8 | 0 | 0 | 0 | 5 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 16 | 58 |
| Count Total | 0 | 9 | 52 | 0 | 0 | 0 | 23 | 13 | 0 | 3 | 0 | 9 | 0 | 0 | 0 | 0 | 109 | 0 |
| Peak Hour | 0 | 2 | 26 | 0 | 0 | 0 | 9 | 9 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 52 | 0 |

| Two-Hour Count Summaries - Bikes | | | | | | | | | | | | | | | | | | |
|----------------------------------|------------|----|----|------------|----|----|----------------|----|----|----------------|----|----|--------------|------------------|--|--|--|--|
| Interval Start | Jewell Ave | | | Jewell Ave | | | E-470 NB Ramps | | | E-470 NB Ramps | | | 15-min Total | Rolling One Hour | | | | |
| | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | | | | | | |
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT | | | | | | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Count Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Peak Hour | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |

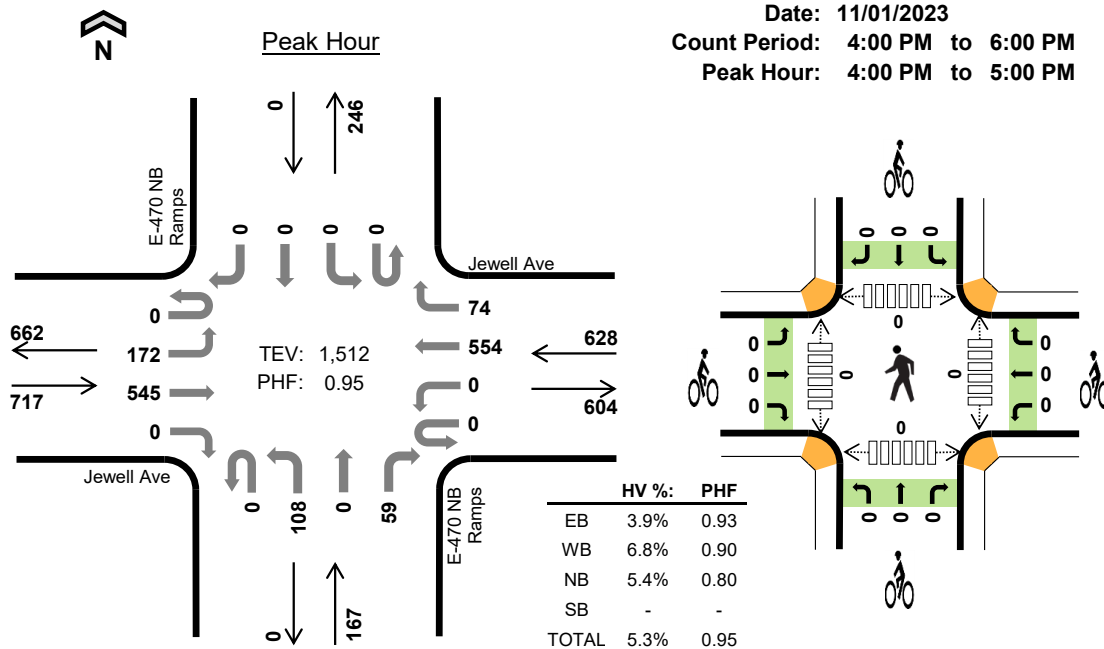
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

E-470 NB Ramps Jewell Ave

Date: 11/01/2023

Count Period: 4:00 PM to 6:00 PM

Peak Hour: 4:00 PM to 5:00 PM



Two-Hour Count Summaries

| Interval Start | | Jewell Ave | | | | Jewell Ave | | | | E-470 NB Ramps | | | | E-470 NB Ramps | | | | 15-min Total | Rolling One Hour |
|----------------|-----|------------|-----|-------|----|------------|----|-------|-----|----------------|-----|----|-----|----------------|----|----|----|--------------|------------------|
| | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | | |
| | | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | | |
| 4:00 PM | | 0 | 46 | 139 | 0 | 0 | 0 | 156 | 18 | 0 | 22 | 0 | 12 | 0 | 0 | 0 | 0 | 393 | 0 |
| 4:15 PM | | 0 | 45 | 114 | 0 | 0 | 0 | 123 | 17 | 0 | 28 | 0 | 12 | 0 | 0 | 0 | 0 | 339 | 0 |
| 4:30 PM | | 0 | 45 | 136 | 0 | 0 | 0 | 127 | 22 | 0 | 30 | 0 | 22 | 0 | 0 | 0 | 0 | 382 | 0 |
| 4:45 PM | | 0 | 36 | 156 | 0 | 0 | 0 | 148 | 17 | 0 | 28 | 0 | 13 | 0 | 0 | 0 | 0 | 398 | 1,512 |
| 5:00 PM | | 0 | 34 | 108 | 0 | 0 | 0 | 115 | 13 | 0 | 30 | 1 | 17 | 0 | 0 | 0 | 0 | 318 | 1,437 |
| 5:15 PM | | 0 | 32 | 136 | 0 | 0 | 0 | 120 | 16 | 0 | 35 | 0 | 16 | 0 | 0 | 0 | 0 | 355 | 1,453 |
| 5:30 PM | | 0 | 29 | 129 | 0 | 0 | 0 | 132 | 15 | 0 | 32 | 0 | 20 | 0 | 0 | 0 | 0 | 357 | 1,428 |
| 5:45 PM | | 0 | 29 | 126 | 0 | 0 | 0 | 127 | 16 | 0 | 35 | 0 | 14 | 0 | 0 | 0 | 0 | 347 | 1,377 |
| Count Total | | 0 | 296 | 1,044 | 0 | 0 | 0 | 1,048 | 134 | 0 | 240 | 1 | 126 | 0 | 0 | 0 | 0 | 2,889 | 0 |
| Peak Hour | All | 0 | 172 | 545 | 0 | 0 | 0 | 554 | 74 | 0 | 108 | 0 | 59 | 0 | 0 | 0 | 0 | 1,512 | 0 |
| | HV | 0 | 13 | 15 | 0 | 0 | 0 | 10 | 33 | 0 | 4 | 0 | 5 | 0 | 0 | 0 | 0 | 80 | 0 |
| | HV% | - | 8% | 3% | - | - | - | 2% | 45% | - | 4% | - | 8% | - | - | - | - | 5% | 0 |

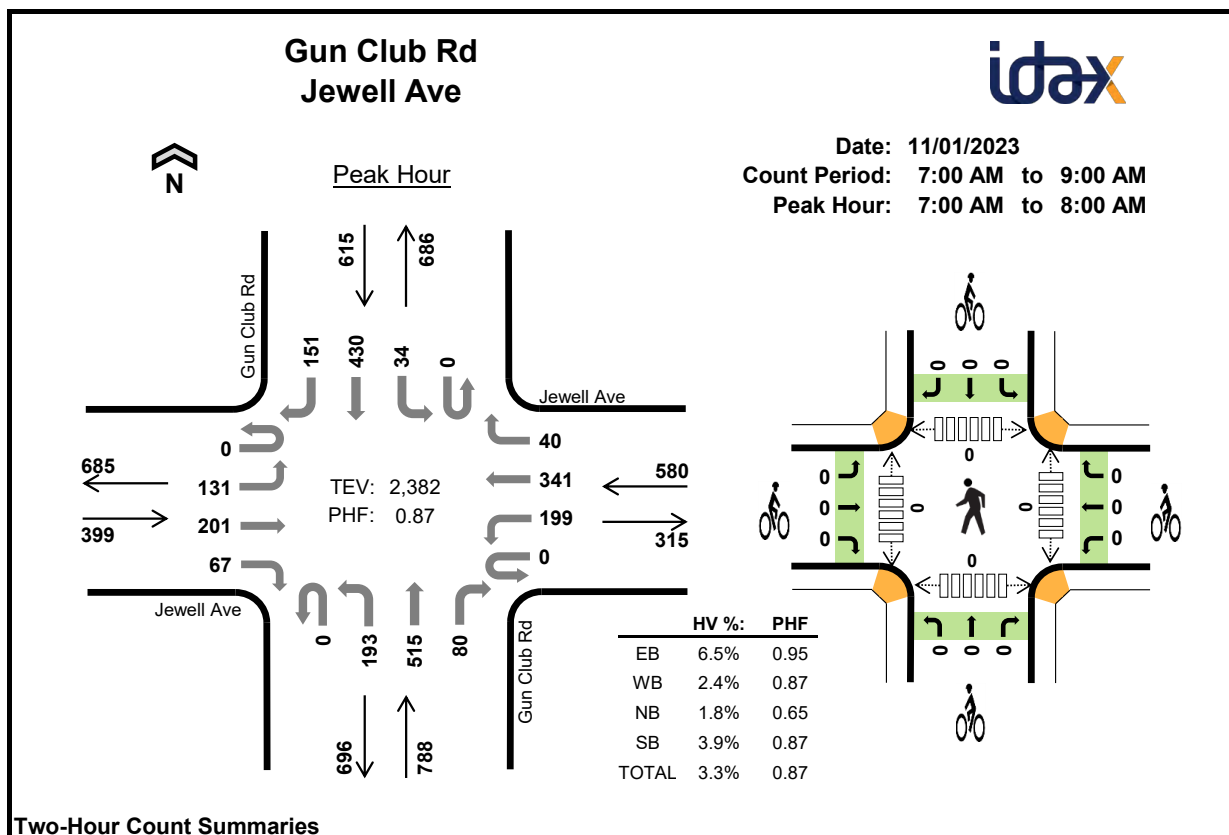
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

[illegible]

| Two-Hour Count Summaries - Heavy Vehicles | | | | | | | | | | | | | | | | | | |
|---|------------|----|----|----|------------|----|----|----|----------------|----|----|----|----------------|----|----|----|--------------|------------------|
| Interval Start | Jewell Ave | | | | Jewell Ave | | | | E-470 NB Ramps | | | | E-470 NB Ramps | | | | 15-min Total | Rolling One Hour |
| | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | | |
| | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | | |
| 4:00 PM | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 11 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 21 | 0 |
| 4:15 PM | 0 | 4 | 3 | 0 | 0 | 0 | 1 | 5 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 15 | 0 |
| 4:30 PM | 0 | 3 | 8 | 0 | 0 | 0 | 4 | 11 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 27 | 0 |
| 4:45 PM | 0 | 2 | 4 | 0 | 0 | 0 | 1 | 6 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 17 | 80 |
| 5:00 PM | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 5 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 69 |
| 5:15 PM | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 6 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 13 | 67 |
| 5:30 PM | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 7 | 47 |
| 5:45 PM | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 41 |
| Count Total | 0 | 17 | 24 | 0 | 0 | 0 | 13 | 49 | 0 | 11 | 0 | 7 | 0 | 0 | 0 | 0 | 121 | 0 |
| Peak Hour | 0 | 13 | 15 | 0 | 0 | 0 | 10 | 33 | 0 | 4 | 0 | 5 | 0 | 0 | 0 | 0 | 80 | 0 |

| Two-Hour Count Summaries - Bikes | | | | | | | | | | | | | | | | | |
|----------------------------------|------------|----|----|------------|----|----|----------------|----|----|----------------|----|----|--------------|------------------|---|---|--|
| Interval Start | Jewell Ave | | | Jewell Ave | | | E-470 NB Ramps | | | E-470 NB Ramps | | | 15-min Total | Rolling One Hour | | | |
| | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | | | | | |
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT | | | | | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Count Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peak Hour | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

**Two-Hour Count Summaries**

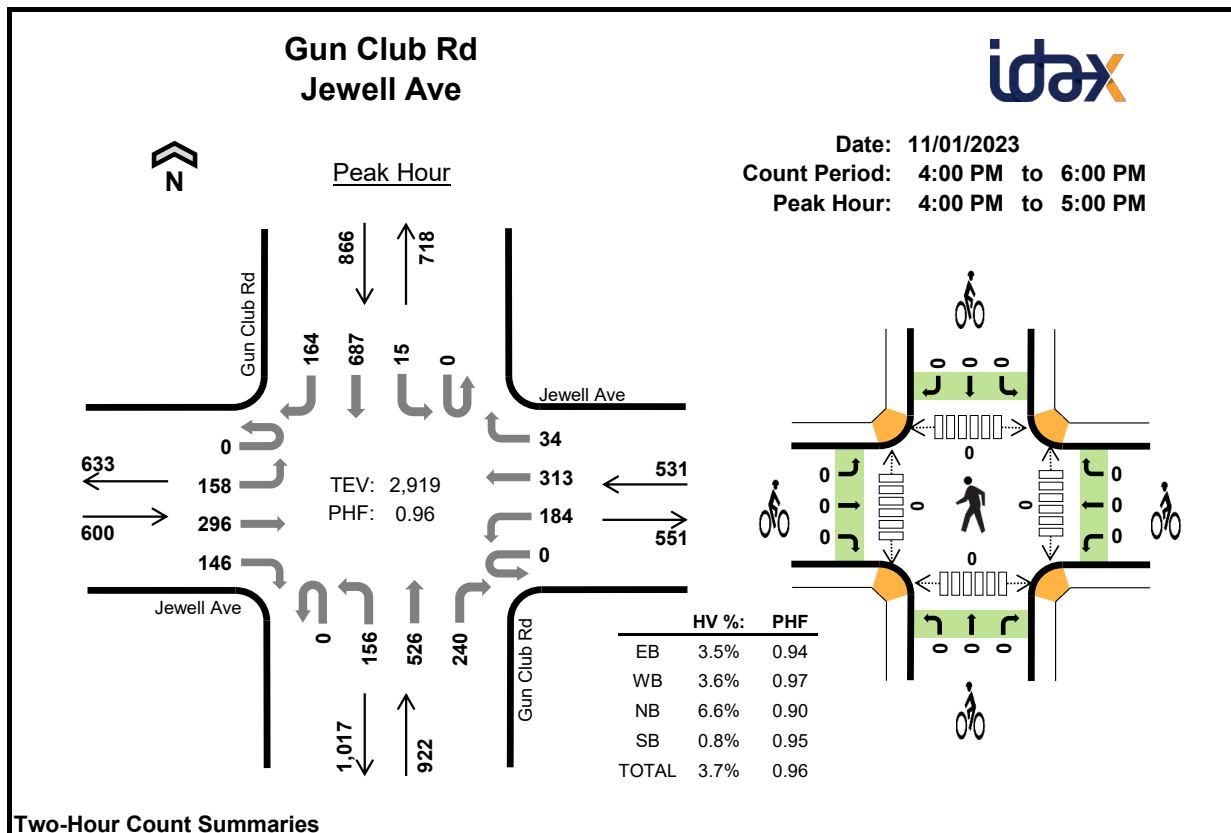
| Interval Start | | Jewell Ave | | | | Jewell Ave | | | | Gun Club Rd | | | | Gun Club Rd | | | | 15-min Total | Rolling One Hour |
|----------------|-----|------------|-----|-----|-----|------------|-----|-----|----|-------------|-----|-----|-----|-------------|----|-----|-----|--------------|------------------|
| | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | | |
| | | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | | |
| 7:00 AM | | 0 | 28 | 68 | 9 | 0 | 38 | 64 | 12 | 0 | 59 | 145 | 25 | 0 | 14 | 75 | 35 | 572 | 0 |
| 7:15 AM | | 0 | 28 | 49 | 16 | 0 | 55 | 72 | 7 | 0 | 70 | 208 | 26 | 0 | 8 | 111 | 38 | 688 | 0 |
| 7:30 AM | | 0 | 37 | 43 | 21 | 0 | 62 | 94 | 10 | 0 | 44 | 108 | 21 | 0 | 5 | 116 | 37 | 598 | 0 |
| 7:45 AM | | 0 | 38 | 41 | 21 | 0 | 44 | 111 | 11 | 0 | 20 | 54 | 8 | 0 | 7 | 128 | 41 | 524 | 2,382 |
| 8:00 AM | | 0 | 44 | 47 | 24 | 0 | 47 | 79 | 11 | 0 | 19 | 76 | 16 | 0 | 11 | 101 | 40 | 515 | 2,325 |
| 8:15 AM | | 0 | 37 | 44 | 18 | 1 | 42 | 69 | 8 | 0 | 53 | 103 | 15 | 0 | 2 | 93 | 42 | 527 | 2,164 |
| 8:30 AM | | 0 | 36 | 44 | 19 | 0 | 26 | 48 | 12 | 0 | 59 | 87 | 24 | 0 | 4 | 92 | 40 | 491 | 2,057 |
| 8:45 AM | | 0 | 36 | 41 | 10 | 0 | 35 | 50 | 8 | 0 | 45 | 53 | 15 | 0 | 5 | 82 | 34 | 414 | 1,947 |
| Count Total | | 0 | 284 | 377 | 138 | 1 | 349 | 587 | 79 | 0 | 369 | 834 | 150 | 0 | 56 | 798 | 307 | 4,329 | 0 |
| Peak Hour | All | 0 | 131 | 201 | 67 | 0 | 199 | 341 | 40 | 0 | 193 | 515 | 80 | 0 | 34 | 430 | 151 | 2,382 | 0 |
| | HV | 0 | 3 | 13 | 10 | 0 | 3 | 8 | 3 | 0 | 5 | 6 | 3 | 0 | 3 | 18 | 3 | 78 | 0 |
| | HV% | - | 2% | 6% | 15% | - | 2% | 2% | 8% | - | 3% | 1% | 4% | - | 9% | 4% | 2% | 3% | 0 |

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

| Interval Start | Heavy Vehicle Totals | | | | | Bicycles | | | | | Pedestrians (Crossing Leg) | | | | |
|----------------|----------------------|----|----|----|-------|----------|----|----|----|-------|----------------------------|------|-------|-------|-------|
| | EB | WB | NB | SB | Total | EB | WB | NB | SB | Total | East | West | North | South | Total |
| 7:00 AM | 4 | 2 | 3 | 2 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 7 | 3 | 8 | 5 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 8 | 3 | 3 | 8 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 7 | 6 | 0 | 9 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 7 | 2 | 2 | 10 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 11 | 1 | 4 | 10 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 9 | 2 | 3 | 8 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 8 | 3 | 6 | 11 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Count Total | 61 | 22 | 29 | 63 | 175 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Peak Hour | 26 | 14 | 14 | 24 | 78 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Two-Hour Count Summaries - Heavy Vehicles | | | | | | | | | | | | | | | | | | |
|---|------------|----|----|----|------------|----|----|----|-------------|----|----|----|-------------|----|----|----|--------------|------------------|
| Interval Start | Jewell Ave | | | | Jewell Ave | | | | Gun Club Rd | | | | Gun Club Rd | | | | 15-min Total | Rolling One Hour |
| | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | | |
| | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | | |
| 7:00 AM | 0 | 1 | 3 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 1 | 11 | 0 |
| 7:15 AM | 0 | 0 | 4 | 3 | 0 | 0 | 3 | 0 | 0 | 4 | 3 | 1 | 0 | 2 | 3 | 0 | 23 | 0 |
| 7:30 AM | 0 | 1 | 2 | 5 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 6 | 2 | 22 | 0 |
| 7:45 AM | 0 | 1 | 4 | 2 | 0 | 2 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 22 | 78 |
| 8:00 AM | 0 | 0 | 3 | 4 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 8 | 1 | 21 | 88 |
| 8:15 AM | 0 | 4 | 3 | 4 | 0 | 0 | 1 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 8 | 2 | 26 | 91 |
| 8:30 AM | 0 | 0 | 6 | 3 | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 5 | 3 | 22 | 91 |
| 8:45 AM | 0 | 1 | 5 | 2 | 0 | 1 | 1 | 1 | 0 | 2 | 1 | 3 | 0 | 0 | 9 | 2 | 28 | 97 |
| Count Total | 0 | 8 | 30 | 23 | 0 | 4 | 13 | 5 | 0 | 12 | 11 | 6 | 0 | 4 | 48 | 11 | 175 | 0 |
| Peak Hour | 0 | 3 | 13 | 10 | 0 | 3 | 8 | 3 | 0 | 5 | 6 | 3 | 0 | 3 | 18 | 3 | 78 | 0 |

| Two-Hour Count Summaries - Bikes | | | | | | | | | | | | | | | | | | |
|---|------------|----|----|------------|----|----|-------------|----|----|-------------|----|----|--------------|------------------|--|--|--|--|
| Interval Start | Jewell Ave | | | Jewell Ave | | | Gun Club Rd | | | Gun Club Rd | | | 15-min Total | Rolling One Hour | | | | |
| | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | | | | | | |
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT | | | | | | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Count Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Peak Hour | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Note: U-Turn volumes for bikes are included in Left-Turn, if any. | | | | | | | | | | | | | | | | | | |

**Two-Hour Count Summaries**

| Interval Start | | Jewell Ave | | | | Jewell Ave | | | | Gun Club Rd | | | | Gun Club Rd | | | | 15-min Total | Rolling One Hour |
|----------------|-----|------------|-----|-----|-----|------------|-----|-----|----|-------------|-----|-------|-----|-------------|----|-------|-----|--------------|------------------|
| | | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | | |
| | | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | | |
| 4:00 PM | | 0 | 44 | 57 | 46 | 0 | 57 | 71 | 5 | 0 | 49 | 120 | 55 | 0 | 1 | 172 | 55 | 732 | 0 |
| 4:15 PM | | 0 | 36 | 71 | 28 | 0 | 51 | 78 | 8 | 0 | 30 | 127 | 68 | 0 | 4 | 158 | 37 | 696 | 0 |
| 4:30 PM | | 0 | 38 | 86 | 34 | 0 | 33 | 84 | 13 | 0 | 43 | 147 | 65 | 0 | 7 | 179 | 33 | 762 | 0 |
| 4:45 PM | | 0 | 40 | 82 | 38 | 0 | 43 | 80 | 8 | 0 | 34 | 132 | 52 | 0 | 3 | 178 | 39 | 729 | 2,919 |
| 5:00 PM | | 0 | 40 | 68 | 30 | 0 | 48 | 55 | 24 | 0 | 31 | 119 | 63 | 0 | 5 | 178 | 36 | 697 | 2,884 |
| 5:15 PM | | 0 | 38 | 74 | 36 | 0 | 39 | 61 | 5 | 0 | 37 | 125 | 60 | 0 | 5 | 196 | 46 | 722 | 2,910 |
| 5:30 PM | | 0 | 45 | 65 | 29 | 0 | 40 | 58 | 12 | 0 | 42 | 172 | 57 | 0 | 6 | 187 | 39 | 752 | 2,900 |
| 5:45 PM | | 0 | 42 | 67 | 37 | 0 | 35 | 61 | 7 | 0 | 45 | 122 | 44 | 0 | 0 | 161 | 39 | 660 | 2,831 |
| Count Total | | 0 | 323 | 570 | 278 | 0 | 346 | 548 | 82 | 0 | 311 | 1,064 | 464 | 0 | 31 | 1,409 | 324 | 5,750 | 0 |
| Peak Hour | All | 0 | 158 | 296 | 146 | 0 | 184 | 313 | 34 | 0 | 156 | 526 | 240 | 0 | 15 | 687 | 164 | 2,919 | 0 |
| | HV | 0 | 4 | 7 | 10 | 0 | 1 | 15 | 3 | 0 | 26 | 30 | 5 | 0 | 0 | 6 | 1 | 108 | 0 |
| | HV% | - | 3% | 2% | 7% | - | 1% | 5% | 9% | - | 17% | 6% | 2% | - | 0% | 1% | 1% | 4% | 0 |

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

| Interval Start | Heavy Vehicle Totals | | | | | Bicycles | | | | | Pedestrians (Crossing Leg) | | | | |
|----------------|----------------------|----|----|----|-------|----------|----|----|----|-------|----------------------------|------|-------|-------|-------|
| | EB | WB | NB | SB | Total | EB | WB | NB | SB | Total | East | West | North | South | Total |
| 4:00 PM | 4 | 9 | 13 | 3 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 3 | 3 | 17 | 2 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 9 | 3 | 17 | 1 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 5 | 4 | 14 | 1 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 2 | 4 | 16 | 4 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 3 | 0 | 12 | 2 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 2 | 1 | 2 | 2 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 3 | 0 | 8 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Count Total | 31 | 24 | 99 | 15 | 169 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Peak Hour | 21 | 19 | 61 | 7 | 108 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Two-Hour Count Summaries - Heavy Vehicles | | | | | | | | | | | | | | | | | | |
|---|------------|----|----|----|------------|----|----|----|-------------|----|----|----|-------------|----|----|----|--------------|------------------|
| Interval Start | Jewell Ave | | | | Jewell Ave | | | | Gun Club Rd | | | | Gun Club Rd | | | | 15-min Total | Rolling One Hour |
| | Eastbound | | | | Westbound | | | | Northbound | | | | Southbound | | | | | |
| | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | UT | LT | TH | RT | | |
| 4:00 PM | 0 | 1 | 2 | 1 | 0 | 1 | 8 | 0 | 0 | 7 | 5 | 1 | 0 | 0 | 2 | 1 | 29 | 0 |
| 4:15 PM | 0 | 0 | 1 | 2 | 0 | 0 | 2 | 1 | 0 | 4 | 9 | 4 | 0 | 0 | 2 | 0 | 25 | 0 |
| 4:30 PM | 0 | 1 | 3 | 5 | 0 | 0 | 2 | 1 | 0 | 11 | 6 | 0 | 0 | 0 | 1 | 0 | 30 | 0 |
| 4:45 PM | 0 | 2 | 1 | 2 | 0 | 0 | 3 | 1 | 0 | 4 | 10 | 0 | 0 | 0 | 1 | 0 | 24 | 108 |
| 5:00 PM | 0 | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 0 | 8 | 7 | 1 | 0 | 0 | 3 | 1 | 26 | 105 |
| 5:15 PM | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 4 | 7 | 1 | 0 | 0 | 1 | 1 | 17 | 97 |
| 5:30 PM | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 7 | 74 |
| 5:45 PM | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 0 | 0 | 0 | 0 | 0 | 11 | 61 |
| Count Total | 0 | 5 | 8 | 18 | 0 | 2 | 17 | 5 | 0 | 42 | 49 | 8 | 0 | 0 | 12 | 3 | 169 | 0 |
| Peak Hour | 0 | 4 | 7 | 10 | 0 | 1 | 15 | 3 | 0 | 26 | 30 | 5 | 0 | 0 | 6 | 1 | 108 | 0 |

| Two-Hour Count Summaries - Bikes | | | | | | | | | | | | | | | | | | |
|----------------------------------|------------|----|----|------------|----|----|-------------|----|----|-------------|----|----|--------------|------------------|--|--|--|--|
| Interval Start | Jewell Ave | | | Jewell Ave | | | Gun Club Rd | | | Gun Club Rd | | | 15-min Total | Rolling One Hour | | | | |
| | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | | | | | | |
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT | | | | | | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Count Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Peak Hour | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Vehicle Classification Report Summary

Location: Jewell Ave W/O Gun Club Rd
Count Direction: Eastbound / Westbound
Date Range: 10/31/2023 to 11/2/2023
Site Code: 01

| Direction | FHWA Vehicle Classification | | | | | | | | | | | | | Total Volume |
|-----------|-----------------------------|--------|-------|------|-------|-------|------|------|------|------|------|------|------|--------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| Eastbound | 53 | 14,386 | 3,316 | 126 | 739 | 253 | 0 | 28 | 285 | 16 | 0 | 0 | 20 | 19,222 |
| | 0.3% | 74.8% | 17.3% | 0.7% | 3.8% | 1.3% | 0.0% | 0.1% | 1.5% | 0.1% | 0.0% | 0.0% | 0.1% | |
| Westbound | 86 | 17,166 | 2,862 | 105 | 550 | 844 | 0 | 5 | 165 | 33 | 0 | 0 | 117 | 21,933 |
| | 0.4% | 78.3% | 13.0% | 0.5% | 2.5% | 3.8% | 0.0% | 0.0% | 0.8% | 0.2% | 0.0% | 0.0% | 0.5% | |
| Total | 139 | 31,552 | 6,178 | 231 | 1,289 | 1,097 | 0 | 33 | 450 | 49 | 0 | 0 | 137 | 41,155 |
| | 0.3% | 76.7% | 15.0% | 0.6% | 3.1% | 2.7% | 0.0% | 0.1% | 1.1% | 0.1% | 0.0% | 0.0% | 0.3% | |

FHWA Vehicle Classification

| | |
|--|--|
| Class 1 - Motorcycles | Class 8 - Four or Fewer Axle Single-Trailer Trucks |
| Class 2 - Passenger Cars | Class 9 - Five-Axle Single-Trailer Trucks |
| Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles | Class 10 - Six or More Axle Single-Trailer Trucks |
| Class 4 - Buses | Class 11 - Five or fewer Axle Multi-Trailer Trucks |
| Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks | Class 12 - Six-Axle Multi-Trailer Trucks |
| Class 6 - Three-Axle Single-Unit Trucks | Class 13 - Seven or More Axle Multi-Trailer Trucks |
| Class 7 - Four or More Axle Single-Unit Trucks | |

Vehicle Speed Report Summary



Location: Jewell Ave W/O Gun Club Rd

Direction: Eastbound / Westbound

Date Range: 10/31/2023 to 11/2/2023

Site Code: 01

| Direction | Speed Range (mph) | | | | | | | | | | | | | | | | | | Total Volume |
|-----------|-------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|--------|--------------|
| | 0 - 10 | 10 - 15 | 15 - 20 | 20 - 25 | 25 - 30 | 30 - 35 | 35 - 40 | 40 - 45 | 45 - 50 | 50 - 55 | 55 - 60 | 60 - 65 | 65 - 70 | 70 - 75 | 75 - 80 | 80 - 85 | 85 + | | |
| Eastbound | 39 | 76 | 81 | 72 | 61 | 191 | 874 | 3,366 | 6,822 | 5,538 | 1,691 | 321 | 60 | 30 | 0 | 0 | 0 | 19,222 | |
| | 0.2% | 0.4% | 0.4% | 0.4% | 0.3% | 1.0% | 4.5% | 17.5% | 35.5% | 28.8% | 8.8% | 1.7% | 0.3% | 0.2% | 0.0% | 0.0% | 0.0% | | |
| Westbound | 1 | 2 | 2 | 3 | 39 | 292 | 1,702 | 5,629 | 8,350 | 4,515 | 1,110 | 214 | 49 | 25 | 0 | 0 | 0 | 21,933 | |
| | 0.0% | 0.0% | 0.0% | 0.0% | 0.2% | 1.3% | 7.8% | 25.7% | 38.1% | 20.6% | 5.1% | 1.0% | 0.2% | 0.1% | 0.0% | 0.0% | 0.0% | | |
| Total | 40 | 78 | 83 | 75 | 100 | 483 | 2,576 | 8,995 | 15,172 | 10,053 | 2,801 | 535 | 109 | 55 | 0 | 0 | 0 | 41,155 | |
| | 0.1% | 0.2% | 0.2% | 0.2% | 0.2% | 1.2% | 6.3% | 21.9% | 36.9% | 24.4% | 6.8% | 1.3% | 0.3% | 0.1% | 0.0% | 0.0% | 0.0% | | |

| Total Study Percentile Speed Summary | | | Total Study Speed Statistics | | |
|--------------------------------------|------|-----|------------------------------|-------------|-----|
| Eastbound | | | Eastbound | | |
| 50th Percentile (Median) | 48.7 | mph | Mean (Average) Speed | 48.2 | mph |
| 85th Percentile | 53.9 | mph | 10 mph Pace | 43.6 - 53.6 | mph |
| 95th Percentile | 57.5 | mph | Percent in Pace | 65.6 | % |
| Westbound | | | Westbound | | |
| 50th Percentile (Median) | 47.0 | mph | Mean (Average) Speed | 47.0 | mph |
| 85th Percentile | 52.2 | mph | 10 mph Pace | 42.5 - 52.5 | mph |
| 95th Percentile | 55.7 | mph | Percent in Pace | 67.2 | % |

Location: Jewell Ave W/O Gun Club Rd
 Date Range: 10/31/2023 - 11/6/2023
 Site Code: 01

| Time | Tuesday 10/31/2023 | | | Wednesday 11/1/2023 | | | Thursday 11/2/2023 | | | Friday 11/3/2023 | | | Saturday 11/4/2023 | | | Sunday 11/5/2023 | | | Monday 11/6/2023 | | | Mid-Week Average | | |
|----------|-----------------------|-------|--------|------------------------|-------|--------|-----------------------|-------|--------|---------------------|----|-------|-----------------------|----|-------|---------------------|----|-------|---------------------|----|-------|------------------|-------|--------|
| | EB | WB | Total | EB | WB | Total | EB | WB | Total | EB | WB | Total | EB | WB | Total | EB | WB | Total | EB | WB | Total | EB | WB | Total |
| 12:00 AM | 43 | 20 | 63 | 40 | 24 | 64 | 36 | 29 | 65 | - | - | - | - | - | - | - | - | - | - | - | - | 40 | 24 | 64 |
| 1:00 AM | 21 | 13 | 34 | 20 | 22 | 42 | 22 | 27 | 49 | - | - | - | - | - | - | - | - | - | - | - | - | 21 | 21 | 42 |
| 2:00 AM | 21 | 16 | 37 | 20 | 19 | 39 | 17 | 11 | 28 | - | - | - | - | - | - | - | - | - | - | - | - | 19 | 15 | 35 |
| 3:00 AM | 14 | 21 | 35 | 21 | 44 | 65 | 20 | 34 | 54 | - | - | - | - | - | - | - | - | - | - | - | - | 18 | 33 | 51 |
| 4:00 AM | 51 | 81 | 132 | 45 | 87 | 132 | 38 | 86 | 124 | - | - | - | - | - | - | - | - | - | - | - | - | 45 | 85 | 129 |
| 5:00 AM | 62 | 235 | 297 | 81 | 269 | 350 | 89 | 273 | 362 | - | - | - | - | - | - | - | - | - | - | - | - | 77 | 259 | 336 |
| 6:00 AM | 254 | 402 | 656 | 248 | 410 | 658 | 272 | 425 | 697 | - | - | - | - | - | - | - | - | - | - | - | - | 258 | 412 | 670 |
| 7:00 AM | 437 | 836 | 1,273 | 402 | 750 | 1,152 | 451 | 745 | 1,196 | - | - | - | - | - | - | - | - | - | - | - | - | 430 | 777 | 1,207 |
| 8:00 AM | 278 | 640 | 918 | 403 | 592 | 995 | 304 | 586 | 890 | - | - | - | - | - | - | - | - | - | - | - | - | 328 | 606 | 934 |
| 9:00 AM | 265 | 380 | 645 | 269 | 446 | 715 | 247 | 359 | 606 | - | - | - | - | - | - | - | - | - | - | - | - | 260 | 395 | 655 |
| 10:00 AM | 222 | 300 | 522 | 247 | 333 | 580 | 275 | 341 | 616 | - | - | - | - | - | - | - | - | - | - | - | - | 248 | 325 | 573 |
| 11:00 AM | 264 | 313 | 577 | 286 | 355 | 641 | 321 | 398 | 719 | - | - | - | - | - | - | - | - | - | - | - | - | 290 | 355 | 646 |
| 12:00 PM | 341 | 307 | 648 | 333 | 329 | 662 | 338 | 373 | 711 | - | - | - | - | - | - | - | - | - | - | - | - | 337 | 336 | 674 |
| 1:00 PM | 337 | 313 | 650 | 330 | 316 | 646 | 373 | 354 | 727 | - | - | - | - | - | - | - | - | - | - | - | - | 347 | 328 | 674 |
| 2:00 PM | 453 | 408 | 861 | 412 | 444 | 856 | 476 | 447 | 923 | - | - | - | - | - | - | - | - | - | - | - | - | 447 | 433 | 880 |
| 3:00 PM | 505 | 544 | 1,049 | 496 | 571 | 1,067 | 553 | 597 | 1,150 | - | - | - | - | - | - | - | - | - | - | - | - | 518 | 571 | 1,089 |
| 4:00 PM | 708 | 575 | 1,283 | 612 | 655 | 1,267 | 566 | 737 | 1,303 | - | - | - | - | - | - | - | - | - | - | - | - | 629 | 656 | 1,284 |
| 5:00 PM | 696 | 536 | 1,232 | 573 | 564 | 1,137 | 588 | 541 | 1,129 | - | - | - | - | - | - | - | - | - | - | - | - | 619 | 547 | 1,166 |
| 6:00 PM | 524 | 343 | 867 | 504 | 410 | 914 | 506 | 429 | 935 | - | - | - | - | - | - | - | - | - | - | - | - | 511 | 394 | 905 |
| 7:00 PM | 324 | 308 | 632 | 319 | 233 | 552 | 325 | 234 | 559 | - | - | - | - | - | - | - | - | - | - | - | - | 323 | 258 | 581 |
| 8:00 PM | 260 | 306 | 566 | 255 | 147 | 402 | 254 | 147 | 401 | - | - | - | - | - | - | - | - | - | - | - | - | 256 | 200 | 456 |
| 9:00 PM | 211 | 206 | 417 | 185 | 105 | 290 | 180 | 112 | 292 | - | - | - | - | - | - | - | - | - | - | - | - | 192 | 141 | 333 |
| 10:00 PM | 116 | 120 | 236 | 114 | 64 | 178 | 122 | 98 | 220 | - | - | - | - | - | - | - | - | - | - | - | - | 117 | 94 | 211 |
| 11:00 PM | 77 | 54 | 131 | 71 | 39 | 110 | 79 | 45 | 124 | - | - | - | - | - | - | - | - | - | - | - | - | 76 | 46 | 122 |
| Total | 6,484 | 7,277 | 13,761 | 6,286 | 7,228 | 13,514 | 6,452 | 7,428 | 13,880 | - | - | - | - | - | - | - | - | - | - | - | - | 6,407 | 7,311 | 13,718 |
| Percent | 47% | 53% | | 47% | 53% | | 46% | 54% | | - | - | - | - | - | - | - | - | - | - | - | - | 47% | 53% | |
| AM Peak | 07:00 | 07:00 | 07:00 | 08:00 | 07:00 | 07:00 | 07:00 | 07:00 | 07:00 | - | - | - | - | - | - | - | - | - | - | - | - | 07:00 | 07:00 | 07:00 |
| Vol. | 437 | 836 | 1,273 | 403 | 750 | 1,152 | 451 | 745 | 1,196 | - | - | - | - | - | - | - | - | - | - | - | - | 430 | 777 | 1,207 |
| PM Peak | 16:00 | 16:00 | 16:00 | 16:00 | 16:00 | 16:00 | 17:00 | 16:00 | 16:00 | - | - | - | - | - | - | - | - | - | - | - | - | 16:00 | 16:00 | 16:00 |
| Vol. | 708 | 575 | 1,283 | 612 | 655 | 1,267 | 588 | 737 | 1,303 | - | - | - | - | - | - | - | - | - | - | - | - | 629 | 656 | 1,284 |

1. Mid-week average includes data between Tuesday and Thursday.

Vehicle Classification Report Summary

Location: Gun Club Rd S/O Jewell Ave
Count Direction: Northbound / Southbound
Date Range: 10/31/2023 to 11/2/2023
Site Code: 02

| Direction | FHWA Vehicle Classification | | | | | | | | | | | | | Total Volume |
|------------|-----------------------------|--------|--------|------|-------|------|------|------|------|------|------|------|------|--------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| Northbound | 98 | 26,237 | 6,401 | 155 | 1,216 | 376 | 0 | 9 | 420 | 19 | 0 | 1 | 40 | 34,972 |
| | 0.3% | 75.0% | 18.3% | 0.4% | 3.5% | 1.1% | 0.0% | 0.0% | 1.2% | 0.1% | 0.0% | 0.0% | 0.1% | |
| Southbound | 104 | 24,710 | 5,380 | 115 | 957 | 329 | 0 | 11 | 289 | 35 | 0 | 0 | 27 | 31,957 |
| | 0.3% | 77.3% | 16.8% | 0.4% | 3.0% | 1.0% | 0.0% | 0.0% | 0.9% | 0.1% | 0.0% | 0.0% | 0.1% | |
| Total | 202 | 50,947 | 11,781 | 270 | 2,173 | 705 | 0 | 20 | 709 | 54 | 0 | 1 | 67 | 66,929 |
| | 0.3% | 76.1% | 17.6% | 0.4% | 3.2% | 1.1% | 0.0% | 0.0% | 1.1% | 0.1% | 0.0% | 0.0% | 0.1% | |

FHWA Vehicle Classification

| | |
|--|--|
| Class 1 - Motorcycles | Class 8 - Four or Fewer Axle Single-Trailer Trucks |
| Class 2 - Passenger Cars | Class 9 - Five-Axle Single-Trailer Trucks |
| Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles | Class 10 - Six or More Axle Single-Trailer Trucks |
| Class 4 - Buses | Class 11 - Five or fewer Axle Multi-Trailer Trucks |
| Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks | Class 12 - Six-Axle Multi-Trailer Trucks |
| Class 6 - Three-Axle Single-Unit Trucks | Class 13 - Seven or More Axle Multi-Trailer Trucks |
| Class 7 - Four or More Axle Single-Unit Trucks | |

Vehicle Speed Report Summary



Location: Gun Club Rd S/O Jewell Ave

Direction: Northbound / Southbound

Date Range: 10/31/2023 to 11/2/2023

Site Code: 02

| Direction | Speed Range (mph) | | | | | | | | | | | | | | | | | | Total Volume |
|------------|-------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|--------|--------------|
| | 0 - 10 | 10 - 15 | 15 - 20 | 20 - 25 | 25 - 30 | 30 - 35 | 35 - 40 | 40 - 45 | 45 - 50 | 50 - 55 | 55 - 60 | 60 - 65 | 65 - 70 | 70 - 75 | 75 - 80 | 80 - 85 | 85 + | | |
| Northbound | 15 | 54 | 126 | 294 | 257 | 331 | 1,002 | 4,315 | 9,965 | 11,335 | 5,567 | 1,347 | 247 | 117 | 0 | 0 | 0 | 34,972 | |
| | 0.0% | 0.2% | 0.4% | 0.8% | 0.7% | 0.9% | 2.9% | 12.3% | 28.5% | 32.4% | 15.9% | 3.9% | 0.7% | 0.3% | 0.0% | 0.0% | 0.0% | | |
| Southbound | 210 | 161 | 101 | 114 | 223 | 791 | 2,298 | 6,041 | 9,557 | 8,150 | 3,337 | 752 | 147 | 75 | 0 | 0 | 0 | 31,957 | |
| | 0.7% | 0.5% | 0.3% | 0.4% | 0.7% | 2.5% | 7.2% | 18.9% | 29.9% | 25.5% | 10.4% | 2.4% | 0.5% | 0.2% | 0.0% | 0.0% | 0.0% | | |
| Total | 225 | 215 | 227 | 408 | 480 | 1,122 | 3,300 | 10,356 | 19,522 | 19,485 | 8,904 | 2,099 | 394 | 192 | 0 | 0 | 0 | 66,929 | |
| | 0.3% | 0.3% | 0.3% | 0.6% | 0.7% | 1.7% | 4.9% | 15.5% | 29.2% | 29.1% | 13.3% | 3.1% | 0.6% | 0.3% | 0.0% | 0.0% | 0.0% | | |

| Total Study Percentile Speed Summary | | | Total Study Speed Statistics | | |
|--------------------------------------|------|-----|------------------------------|-------------|-----|
| Northbound | | | Northbound | | |
| 50th Percentile (Median) | 50.4 | mph | Mean (Average) Speed | 50.0 | mph |
| 85th Percentile | 56.3 | mph | 10 mph Pace | 45.7 - 55.7 | mph |
| 95th Percentile | 59.9 | mph | Percent in Pace | 61.2 | % |
| Southbound | | | Southbound | | |
| 50th Percentile (Median) | 48.2 | mph | Mean (Average) Speed | 47.5 | mph |
| 85th Percentile | 54.6 | mph | 10 mph Pace | 44.1 - 54.1 | mph |
| 95th Percentile | 58.5 | mph | Percent in Pace | 56.2 | % |

Location: Gun Club Rd S/O Jewell Ave
 Date Range: 10/31/2023 - 11/6/2023
 Site Code: 02

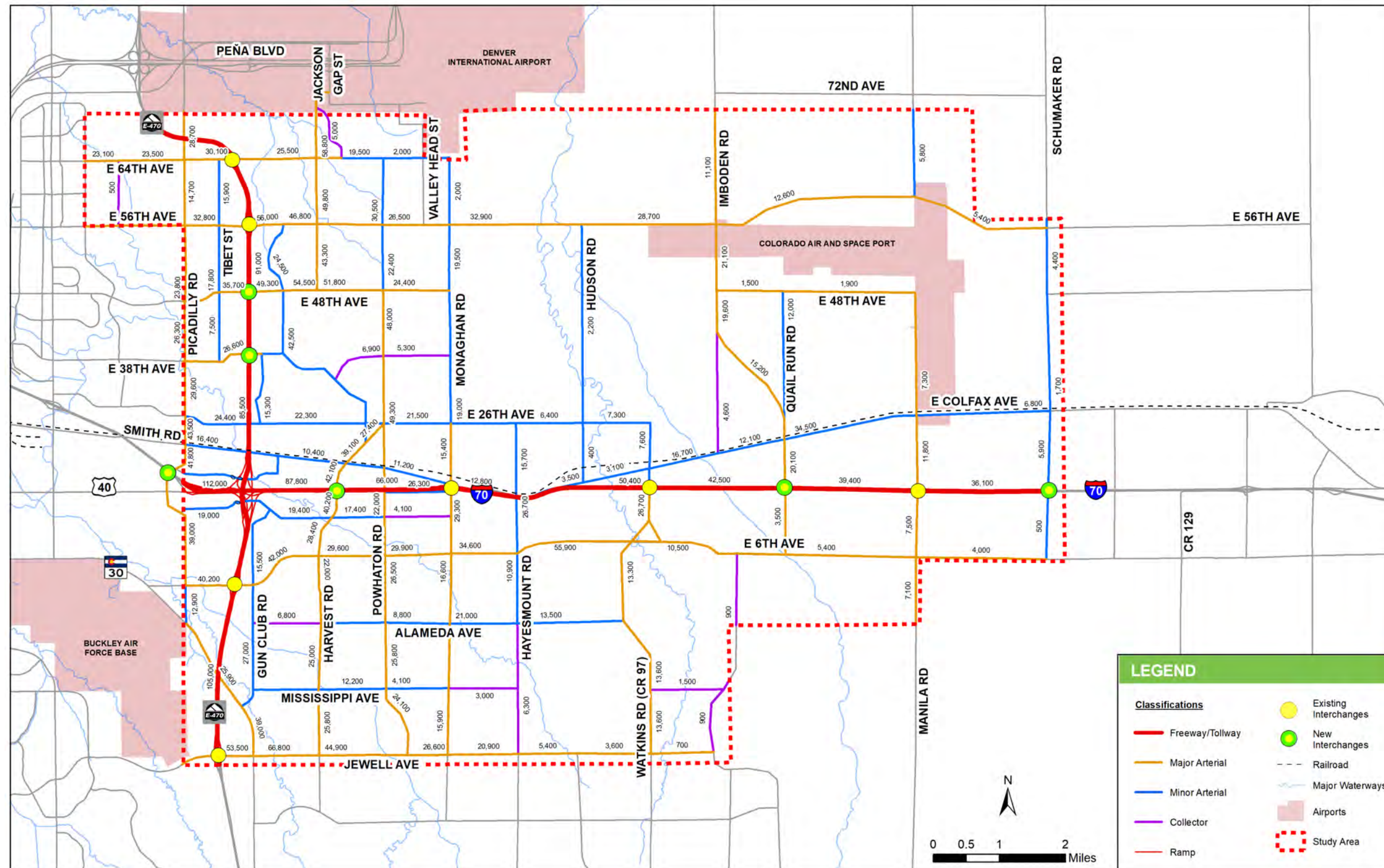
| Time | Tuesday 10/31/2023 | | | Wednesday 11/1/2023 | | | Thursday 11/2/2023 | | | Friday 11/3/2023 | | | Saturday 11/4/2023 | | | Sunday 11/5/2023 | | | Monday 11/6/2023 | | | Mid-Week Average | | |
|----------|-----------------------|--------|--------|------------------------|--------|--------|-----------------------|--------|--------|---------------------|----|-------|-----------------------|----|-------|---------------------|----|-------|---------------------|----|-------|------------------|--------|--------|
| | NB | SB | Total | NB | SB | Total | NB | SB | Total | NB | SB | Total | NB | SB | Total | NB | SB | Total | NB | SB | Total | NB | SB | Total |
| 12:00 AM | 33 | 53 | 86 | 57 | 75 | 132 | 40 | 64 | 104 | - | - | - | - | - | - | - | - | - | - | - | - | 43 | 64 | 107 |
| 1:00 AM | 29 | 44 | 73 | 39 | 42 | 81 | 36 | 35 | 71 | - | - | - | - | - | - | - | - | - | - | - | - | 35 | 40 | 75 |
| 2:00 AM | 59 | 35 | 94 | 64 | 39 | 103 | 51 | 31 | 82 | - | - | - | - | - | - | - | - | - | - | - | - | 58 | 35 | 93 |
| 3:00 AM | 101 | 52 | 153 | 97 | 46 | 143 | 91 | 42 | 133 | - | - | - | - | - | - | - | - | - | - | - | - | 96 | 47 | 143 |
| 4:00 AM | 207 | 81 | 288 | 215 | 82 | 297 | 218 | 77 | 295 | - | - | - | - | - | - | - | - | - | - | - | - | 213 | 80 | 293 |
| 5:00 AM | 478 | 184 | 662 | 478 | 183 | 661 | 512 | 217 | 729 | - | - | - | - | - | - | - | - | - | - | - | - | 489 | 195 | 684 |
| 6:00 AM | 792 | 448 | 1,240 | 825 | 464 | 1,289 | 790 | 474 | 1,264 | - | - | - | - | - | - | - | - | - | - | - | - | 802 | 462 | 1,264 |
| 7:00 AM | 1,101 | 700 | 1,801 | 799 | 666 | 1,465 | 1,118 | 726 | 1,844 | - | - | - | - | - | - | - | - | - | - | - | - | 1,006 | 697 | 1,703 |
| 8:00 AM | 965 | 725 | 1,690 | 418 | 568 | 986 | 881 | 664 | 1,545 | - | - | - | - | - | - | - | - | - | - | - | - | 755 | 652 | 1,407 |
| 9:00 AM | 523 | 492 | 1,015 | 601 | 464 | 1,065 | 547 | 500 | 1,047 | - | - | - | - | - | - | - | - | - | - | - | - | 557 | 485 | 1,042 |
| 10:00 AM | 462 | 498 | 960 | 489 | 446 | 935 | 461 | 469 | 930 | - | - | - | - | - | - | - | - | - | - | - | - | 471 | 471 | 942 |
| 11:00 AM | 521 | 539 | 1,060 | 473 | 505 | 978 | 521 | 539 | 1,060 | - | - | - | - | - | - | - | - | - | - | - | - | 505 | 528 | 1,033 |
| 12:00 PM | 557 | 519 | 1,076 | 562 | 520 | 1,082 | 547 | 549 | 1,096 | - | - | - | - | - | - | - | - | - | - | - | - | 555 | 529 | 1,085 |
| 1:00 PM | 567 | 623 | 1,190 | 555 | 581 | 1,136 | 588 | 546 | 1,134 | - | - | - | - | - | - | - | - | - | - | - | - | 570 | 583 | 1,153 |
| 2:00 PM | 605 | 790 | 1,395 | 660 | 700 | 1,360 | 641 | 820 | 1,461 | - | - | - | - | - | - | - | - | - | - | - | - | 635 | 770 | 1,405 |
| 3:00 PM | 874 | 964 | 1,838 | 724 | 974 | 1,698 | 782 | 995 | 1,777 | - | - | - | - | - | - | - | - | - | - | - | - | 793 | 978 | 1,771 |
| 4:00 PM | 965 | 994 | 1,959 | 942 | 1,005 | 1,947 | 969 | 1,020 | 1,989 | - | - | - | - | - | - | - | - | - | - | - | - | 959 | 1,006 | 1,965 |
| 5:00 PM | 929 | 995 | 1,924 | 902 | 1,027 | 1,929 | 955 | 926 | 1,881 | - | - | - | - | - | - | - | - | - | - | - | - | 929 | 983 | 1,911 |
| 6:00 PM | 655 | 683 | 1,338 | 791 | 720 | 1,511 | 754 | 760 | 1,514 | - | - | - | - | - | - | - | - | - | - | - | - | 733 | 721 | 1,454 |
| 7:00 PM | 485 | 395 | 880 | 503 | 423 | 926 | 542 | 474 | 1,016 | - | - | - | - | - | - | - | - | - | - | - | - | 510 | 431 | 941 |
| 8:00 PM | 484 | 375 | 859 | 386 | 318 | 704 | 394 | 313 | 707 | - | - | - | - | - | - | - | - | - | - | - | - | 421 | 335 | 757 |
| 9:00 PM | 297 | 286 | 583 | 246 | 225 | 471 | 237 | 225 | 462 | - | - | - | - | - | - | - | - | - | - | - | - | 260 | 245 | 505 |
| 10:00 PM | 180 | 190 | 370 | 145 | 183 | 328 | 166 | 191 | 357 | - | - | - | - | - | - | - | - | - | - | - | - | 164 | 188 | 352 |
| 11:00 PM | 108 | 127 | 235 | 81 | 116 | 197 | 102 | 136 | 238 | - | - | - | - | - | - | - | - | - | - | - | - | 97 | 126 | 223 |
| Total | 11,977 | 10,792 | 22,769 | 11,052 | 10,372 | 21,424 | 11,943 | 10,793 | 22,736 | - | - | - | - | - | - | - | - | - | - | - | - | 11,657 | 10,652 | 22,310 |
| Percent | 53% | 47% | | 52% | 48% | | 53% | 47% | | - | - | - | - | - | - | - | - | - | - | - | - | 52% | 48% | |
| AM Peak | 07:00 | 08:00 | 07:00 | 06:00 | 07:00 | 07:00 | 07:00 | 07:00 | 07:00 | - | - | - | - | - | - | - | - | - | - | - | - | 07:00 | 07:00 | 07:00 |
| Vol. | 1,101 | 725 | 1,801 | 825 | 666 | 1,465 | 1,118 | 726 | 1,844 | - | - | - | - | - | - | - | - | - | - | - | - | 1,006 | 697 | 1,703 |
| PM Peak | 16:00 | 17:00 | 16:00 | 16:00 | 17:00 | 16:00 | 16:00 | 16:00 | 16:00 | - | - | - | - | - | - | - | - | - | - | - | - | 16:00 | 16:00 | 16:00 |
| Vol. | 965 | 995 | 1,959 | 942 | 1,027 | 1,947 | 969 | 1,020 | 1,989 | - | - | - | - | - | - | - | - | - | - | - | - | 959 | 1,006 | 1,965 |

1. Mid-week average includes data between Tuesday and Thursday.

Background Documentation

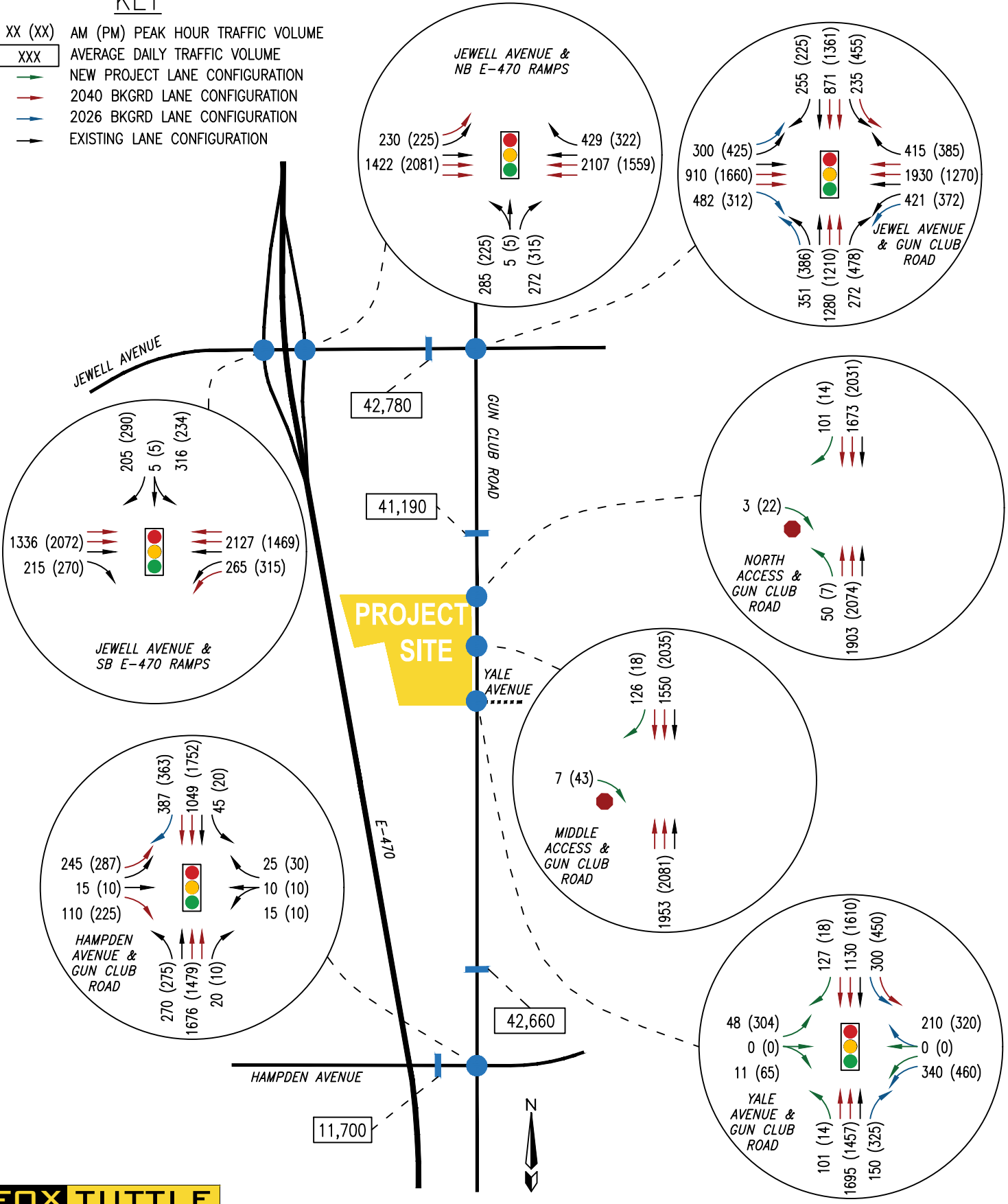


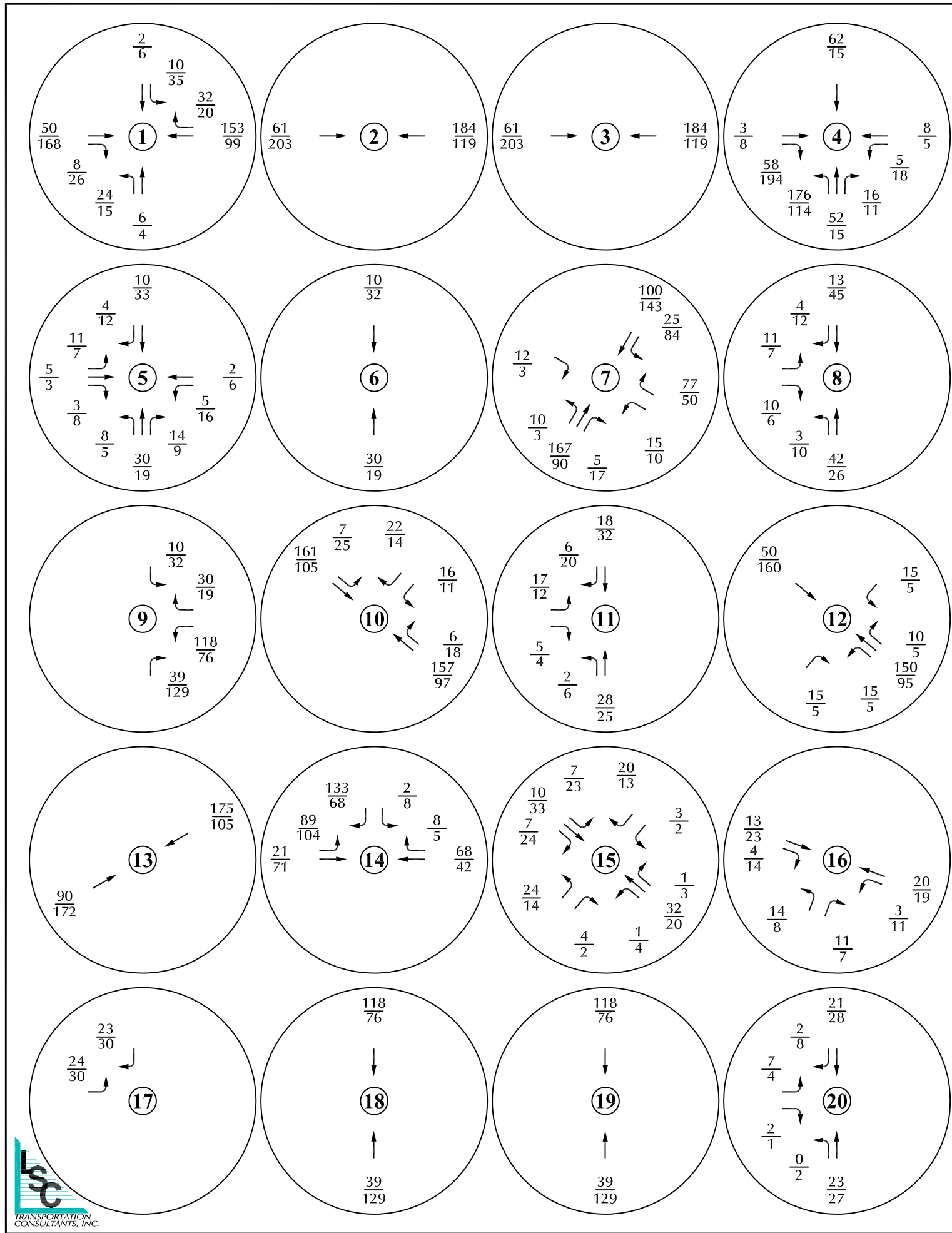
Figure 10.
Buildout Daily Traffic Volumes



KEY

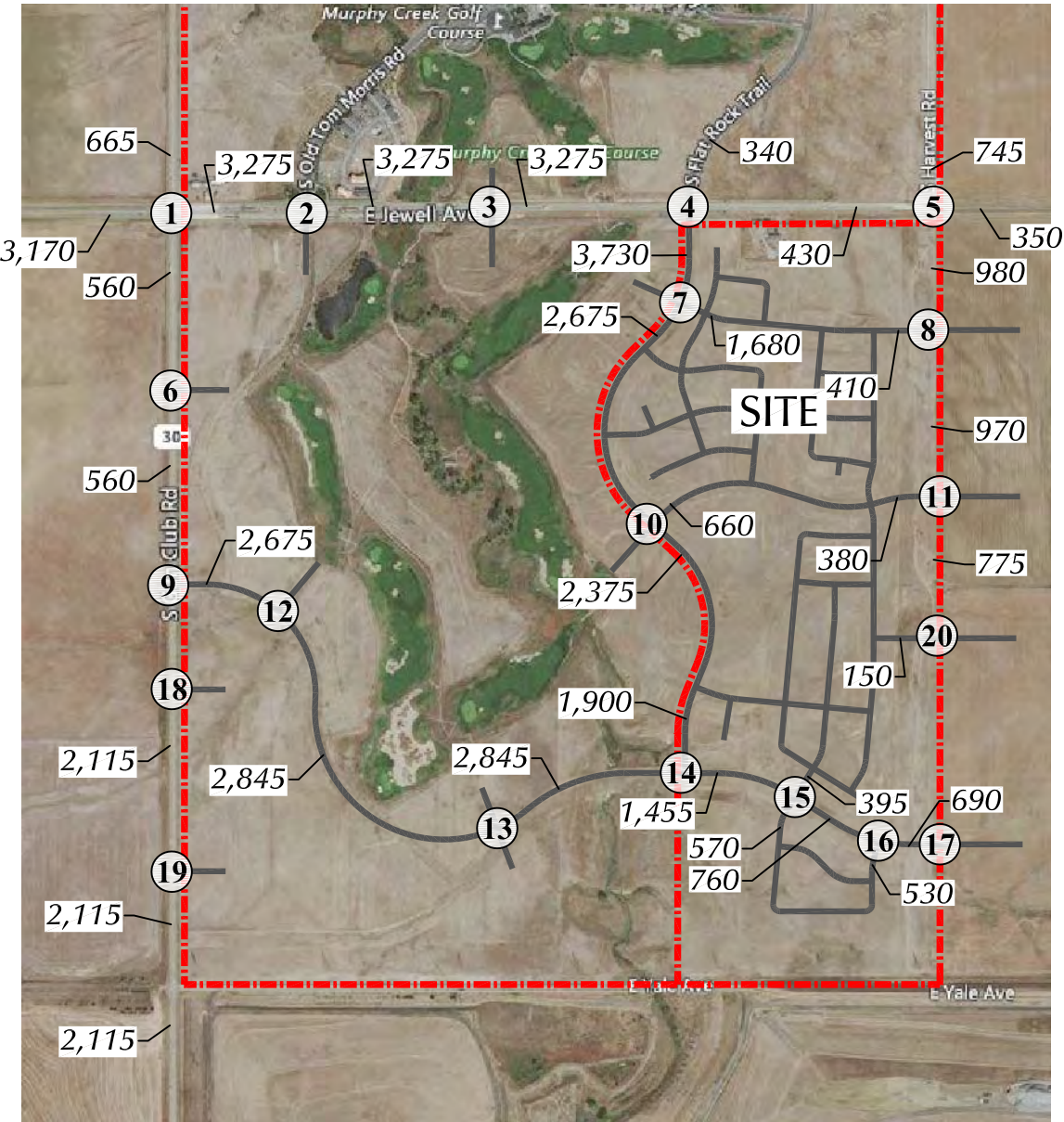
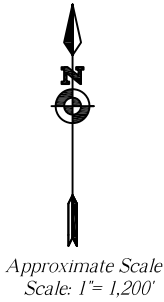
- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUME
- XXX AVERAGE DAILY TRAFFIC VOLUME
- NEW PROJECT LANE CONFIGURATION
- 2040 BKGRD LANE CONFIGURATION
- 2026 BKGRD LANE CONFIGURATION
- EXISTING LANE CONFIGURATION





LEGEND:

$\frac{26}{35}$ = AM Peak Hour Traffic
 $\frac{35}{26}$ = PM Peak Hour Traffic
 1,000 = Average Daily Traffic



Note: The proposed school site does not have a site plan so trips were loaded to S. Flat Rock Trail south of intersection #10

Figure 7b

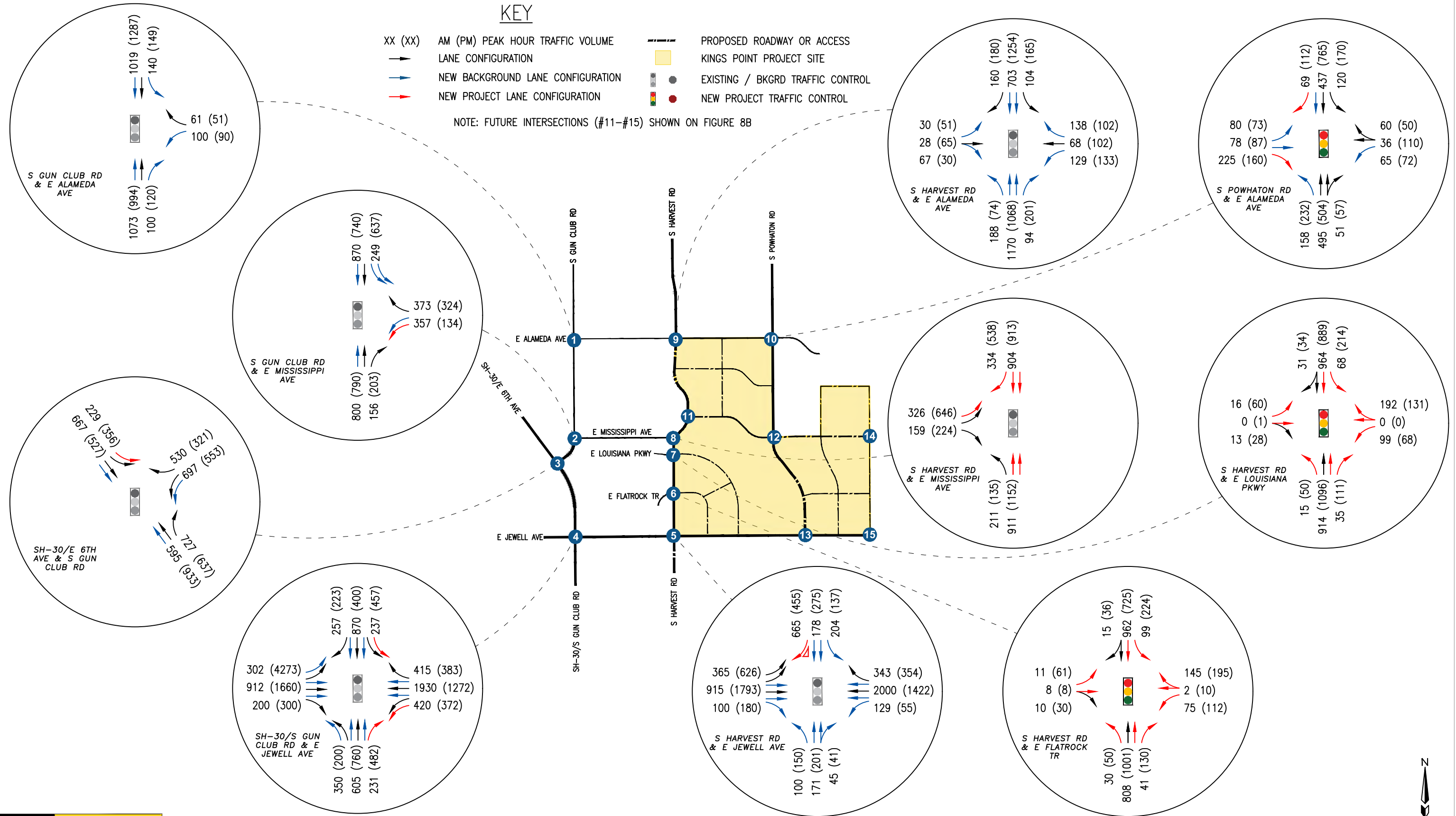
Assignment of 2040 Buildout Site-Generated Traffic

Murphy Creek East (LSC #181110)

KEY

- XX (XX) AM (PM) PEAK HOUR TRAFFIC VOLUME
- LANE CONFIGURATION
- NEW BACKGROUND LANE CONFIGURATION
- NEW PROJECT LANE CONFIGURATION
- PROPOSED ROADWAY OR ACCESS
- KINGS POINT PROJECT SITE
- EXISTING / BKGRD TRAFFIC CONTROL
- NEW PROJECT TRAFFIC CONTROL

NOTE: FUTURE INTERSECTIONS (#11-#15) SHOWN ON FIGURE 8B



Intersection Capacity Worksheets:
2023 Existing

| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 5.5 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↑ | ↗ | ↖ | ↑ | | | | | | ↖ | ↗ |
| Traffic Vol, veh/h | 0 | 537 | 160 | 112 | 698 | 0 | 0 | 0 | 0 | 38 | 1 | 168 |
| Future Vol, veh/h | 0 | 537 | 160 | 112 | 698 | 0 | 0 | 0 | 0 | 38 | 1 | 168 |
| 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 | - | - | 300 | 250 | - | - | - | - | - | - | - | 0 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 89 | 89 | 89 | 92 | 92 | 92 | 87 | 87 | 87 |
| Heavy Vehicles, % | 3 | 3 | 3 | 1 | 1 | 1 | 2 | 2 | 2 | 17 | 4 | 17 |
| Mvmt Flow | 0 | 565 | 168 | 126 | 784 | 0 | 0 | 0 | 0 | 44 | 1 | 193 |

| Major/Minor | Major1 | | | Major2 | | | Minor2 | | |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|
| Conflicting Flow All | - | 0 | 0 | 733 | 0 | 0 | 1685 | 1769 | 784 |
| Stage 1 | - | - | - | - | - | - | 1036 | 1036 | - |
| Stage 2 | - | - | - | - | - | - | 649 | 733 | - |
| Critical Hdwy | - | - | - | 4.11 | - | - | 6.57 | 6.54 | 6.37 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 5.57 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 5.57 | 5.54 | - |
| Follow-up Hdwy | - | - | - | 2.209 | - | - | 3.653 | 4.036 | 3.453 |
| Pot Cap-1 Maneuver | 0 | - | - | 876 | - | 0 | 95 | 82 | 370 |
| Stage 1 | 0 | - | - | - | - | 0 | 321 | 306 | - |
| Stage 2 | 0 | - | - | - | - | 0 | 493 | 423 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | - | - | - | 876 | - | - | 81 | 0 | 370 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 81 | 0 | - |
| Stage 1 | - | - | - | - | - | - | 321 | 0 | - |
| Stage 2 | - | - | - | - | - | - | 422 | 0 | - |

| Approach | EB | WB | SB |
|----------------------|----|-----|----|
| HCM Control Delay, s | 0 | 1.4 | 38 |
| HCM LOS | | | E |

| Minor Lane/Major Mvmt | EBT | EBR | WBL | WBT | SBLn1 | SBLn2 |
|-----------------------|-----|-----|-------|-----|-------|-------|
| Capacity (veh/h) | - | - | 876 | - | 81 | 370 |
| HCM Lane V/C Ratio | - | - | 0.144 | - | 0.553 | 0.522 |
| HCM Control Delay (s) | - | - | 9.8 | - | 94.4 | 24.9 |
| HCM Lane LOS | - | - | A | - | F | C |
| HCM 95th %tile Q(veh) | - | - | 0.5 | - | 2.4 | 2.9 |

























| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 81.1 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ↰ | ↑ | | | ↑ | ↰ | | ↰ | ↰ | | | |
| Traffic Vol, veh/h | 198 | 377 | 0 | 0 | 636 | 49 | 174 | 0 | 44 | 0 | 0 | 0 |
| Future Vol, veh/h | 198 | 377 | 0 | 0 | 636 | 49 | 174 | 0 | 44 | 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 | 250 | - | - | - | - | 250 | - | - | 175 | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 88 | 88 | 88 | 87 | 87 | 87 | 92 | 92 | 92 |
| Heavy Vehicles, % | 5 | 5 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 |
| Mvmt Flow | 208 | 397 | 0 | 0 | 723 | 56 | 200 | 0 | 51 | 0 | 0 | 0 |

| Major/Minor | Major1 | | Major2 | | Minor1 | | | | | |
|----------------------|--------|---|--------|---|--------|---|-------|-------|-------|--|
| Conflicting Flow All | 779 | 0 | - | - | - | 0 | 1564 | 1592 | 397 | |
| Stage 1 | - | - | - | - | - | - | 813 | 813 | - | |
| Stage 2 | - | - | - | - | - | - | 751 | 779 | - | |
| Critical Hdwy | 4.15 | - | - | - | - | - | 6.43 | 6.53 | 6.23 | |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 5.43 | 5.53 | - | |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 5.43 | 5.53 | - | |
| Follow-up Hdwy | 2.245 | - | - | - | - | - | 3.527 | 4.027 | 3.327 | |
| Pot Cap-1 Maneuver | 825 | - | 0 | 0 | - | - | ~ 122 | 107 | 650 | |
| Stage 1 | - | - | 0 | 0 | - | - | 434 | 390 | - | |
| Stage 2 | - | - | 0 | 0 | - | - | 464 | 405 | - | |
| Platoon blocked, % | | - | | | - | - | | | | |
| Mov Cap-1 Maneuver | 825 | - | - | - | - | - | ~ 91 | 0 | 650 | |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | ~ 91 | 0 | - | |
| Stage 1 | - | - | - | - | - | - | 325 | 0 | - | |
| Stage 2 | - | - | - | - | - | - | 464 | 0 | - | |

| Approach | EB | WB | NB |
|----------------------|-----|----|----------|
| HCM Control Delay, s | 3.7 | 0 | \$ 519.8 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBL | EBT | WBT | WBR |
|-----------------------|----------|-------|-------|-----|-----|-----|
| Capacity (veh/h) | 91 | 650 | 825 | - | - | - |
| HCM Lane V/C Ratio | 2.198 | 0.078 | 0.253 | - | - | - |
| HCM Control Delay (s) | \$ 648.4 | 11 | 10.8 | - | - | - |
| HCM Lane LOS | F | B | B | - | - | - |
| HCM 95th %tile Q(veh) | 17.8 | 0.3 | 1 | - | - | - |

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

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 131 | 218 | 72 | 199 | 341 | 40 | 193 | 515 | 80 | 34 | 430 | 151 |
| Future Volume (vph) | 131 | 218 | 72 | 199 | 341 | 40 | 193 | 515 | 80 | 34 | 430 | 151 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 4.0 | 4.0 | 3.0 | 5.0 | 5.0 | 4.0 | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.5 | 32.0 | 32.0 | 9.5 | 32.0 | 32.0 | 9.5 | 40.0 | 40.0 | 9.5 | 29.0 | 29.0 |
| Total Split (s) | 19.0 | 18.0 | 18.0 | 19.0 | 18.0 | 18.0 | 23.0 | 65.0 | 65.0 | 18.0 | 60.0 | 60.0 |
| Total Split (%) | 15.8% | 15.0% | 15.0% | 15.8% | 15.0% | 15.0% | 19.2% | 54.2% | 54.2% | 15.0% | 50.0% | 50.0% |
| Yellow Time (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120









Actuated Cycle Length: 120













Offset: 108.5 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 95

Control Type: Actuated-Coordinated

Splits and Phases: 3: Gun Club Road & Jewell Avenue

| | | | |
|--|--|--|--|
|  Ø1 |  Ø2 (R) |  Ø3 |  Ø4 |
| 18 s | 65 s | 19 s | 18 s |
|  Ø5 |  Ø6 (R) |  Ø7 |  Ø8 |
| 23 s | 60 s | 19 s | 18 s |

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 138 | 229 | 76 | 229 | 392 | 46 | 297 | 792 | 123 | 39 | 494 | 174 |
| v/c Ratio | 0.68 | 1.13 | 0.27 | 0.89 | 1.50 | 0.14 | 0.58 | 0.73 | 0.13 | 0.14 | 0.56 | 0.21 |
| Control Delay | 52.7 | 150.4 | 4.9 | 72.2 | 282.0 | 0.9 | 13.6 | 24.7 | 2.7 | 9.6 | 25.6 | 3.4 |
| 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 | 52.7 | 150.4 | 4.9 | 72.2 | 282.0 | 0.9 | 13.6 | 24.7 | 2.7 | 9.6 | 25.6 | 3.4 |
| Queue Length 50th (ft) | 86 | ~213 | 0 | 150 | ~424 | 0 | 89 | 463 | 0 | 10 | 263 | 0 |
| Queue Length 95th (ft) | 144 | #374 | 16 | #267 | #637 | 0 | 88 | 369 | 8 | 22 | 376 | 36 |
| Internal Link Dist (ft) | | 2523 | | | 1479 | | | 2542 | | | 790 | |
| Turn Bay Length (ft) | 220 | | 330 | 300 | | | 485 | | 360 | 200 | | 325 |
| Base Capacity (vph) | 258 | 203 | 277 | 265 | 261 | 323 | 555 | 1083 | 972 | 374 | 883 | 840 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.53 | 1.13 | 0.27 | 0.86 | 1.50 | 0.14 | 0.54 | 0.73 | 0.13 | 0.10 | 0.56 | 0.21 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

























Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary

11/22/2023

3: Gun Club Road & Jewell Avenue

2023 Existing - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 131 | 218 | 72 | 199 | 341 | 40 | 193 | 515 | 80 | 34 | 430 | 151 |
| Future Volume (veh/h) | 131 | 218 | 72 | 199 | 341 | 40 | 193 | 515 | 80 | 34 | 430 | 151 |
| 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 | 1811 | 1811 | 1811 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1841 | 1841 | 1841 |
| Adj Flow Rate, veh/h | 138 | 229 | 76 | 229 | 392 | 46 | 297 | 792 | 123 | 39 | 494 | 174 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.87 | 0.87 | 0.87 | 0.65 | 0.65 | 0.65 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 6 | 6 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 |
| Cap, veh/h | 208 | 196 | 166 | 268 | 260 | 220 | 479 | 1077 | 913 | 261 | 925 | 784 |
| Arrive On Green | 0.09 | 0.11 | 0.11 | 0.12 | 0.14 | 0.14 | 0.10 | 0.58 | 0.58 | 0.02 | 0.50 | 0.50 |
| Sat Flow, veh/h | 1725 | 1811 | 1535 | 1781 | 1870 | 1585 | 1781 | 1870 | 1585 | 1753 | 1841 | 1560 |
| Grp Volume(v), veh/h | 138 | 229 | 76 | 229 | 392 | 46 | 297 | 792 | 123 | 39 | 494 | 174 |
| Grp Sat Flow(s),veh/h/ln | 1725 | 1811 | 1535 | 1781 | 1870 | 1585 | 1781 | 1870 | 1585 | 1753 | 1841 | 1560 |
| Q Serve(g_s), s | 8.4 | 13.0 | 5.6 | 13.6 | 16.7 | 3.1 | 9.2 | 37.4 | 4.3 | 1.3 | 21.9 | 7.5 |
| Cycle Q Clear(g_c), s | 8.4 | 13.0 | 5.6 | 13.6 | 16.7 | 3.1 | 9.2 | 37.4 | 4.3 | 1.3 | 21.9 | 7.5 |
| 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 | 208 | 196 | 166 | 268 | 260 | 220 | 479 | 1077 | 913 | 261 | 925 | 784 |
| V/C Ratio(X) | 0.66 | 1.17 | 0.46 | 0.86 | 1.51 | 0.21 | 0.62 | 0.74 | 0.13 | 0.15 | 0.53 | 0.22 |
| Avail Cap(c_a), veh/h | 261 | 196 | 166 | 268 | 260 | 220 | 573 | 1077 | 913 | 409 | 925 | 784 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.0 | 53.5 | 50.2 | 41.5 | 51.7 | 45.8 | 14.5 | 18.7 | 11.7 | 17.4 | 20.3 | 16.7 |
| Incr Delay (d2), s/veh | 2.2 | 116.6 | 2.0 | 21.8 | 247.3 | 0.5 | 1.5 | 4.5 | 0.3 | 0.3 | 2.2 | 0.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.6 | 12.1 | 2.2 | 7.4 | 25.5 | 1.2 | 3.3 | 15.3 | 1.5 | 0.5 | 9.1 | 2.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 45.3 | 170.1 | 52.1 | 63.3 | 299.0 | 46.3 | 15.9 | 23.2 | 12.0 | 17.6 | 22.5 | 17.4 |
| LnGrp LOS | D | F | D | E | F | D | B | C | B | B | C | B |
| Approach Vol, veh/h | | 443 | | | 667 | | | 1212 | | | 707 | |
| Approach Delay, s/veh | | 111.0 | | | 200.6 | | | 20.3 | | | 21.0 | |
| Approach LOS | | F | | | F | | | C | | | C | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 7.9 | 75.1 | 19.0 | 18.0 | 16.7 | 66.3 | 15.3 | 21.7 | | | | |
| 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 | 13.0 | 59.0 | 14.0 | 13.0 | 18.0 | 54.0 | 14.0 | 13.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.3 | 39.4 | 15.6 | 15.0 | 11.2 | 23.9 | 10.4 | 18.7 | | | | |
| Green Ext Time (p_c), s | 0.0 | 11.8 | 0.0 | 0.0 | 0.5 | 9.7 | 0.0 | 0.0 | | | | |

Intersection Summary

HCM 6th Ctrl Delay 73.4

HCM 6th LOS E

Notes

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

| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 4.9 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↑ | ↗ | ↖ | ↑ | | | | | | ↑ | ↗ |
| Traffic Vol, veh/h | 0 | 679 | 283 | 93 | 574 | 0 | 0 | 0 | 0 | 34 | 3 | 231 |
| Future Vol, veh/h | 0 | 679 | 283 | 93 | 574 | 0 | 0 | 0 | 0 | 34 | 3 | 231 |
| 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 | - | - | 300 | 250 | - | - | - | - | - | - | - | 0 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 96 | 96 | 96 | 92 | 92 | 92 | 86 | 86 | 86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 6 | 6 |
| Mvmt Flow | 0 | 715 | 298 | 97 | 598 | 0 | 0 | 0 | 0 | 40 | 3 | 269 |

| Major/Minor | Major1 | | | Major2 | | | Minor2 | | |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|
| Conflicting Flow All | - | 0 | 0 | 1013 | 0 | 0 | 1656 | 1805 | 598 |
| Stage 1 | - | - | - | - | - | - | 792 | 792 | - |
| Stage 2 | - | - | - | - | - | - | 864 | 1013 | - |
| Critical Hdwy | - | - | - | 4.12 | - | - | 6.46 | 6.56 | 6.26 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 5.46 | 5.56 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 5.46 | 5.56 | - |
| Follow-up Hdwy | - | - | - | 2.218 | - | - | 3.554 | 4.054 | 3.354 |
| Pot Cap-1 Maneuver | 0 | - | - | 684 | - | 0 | 105 | 77 | 495 |
| Stage 1 | 0 | - | - | - | - | 0 | 439 | 395 | - |
| Stage 2 | 0 | - | - | - | - | 0 | 406 | 311 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | - | - | - | 684 | - | - | 90 | 0 | 495 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 90 | 0 | - |
| Stage 1 | - | - | - | - | - | - | 439 | 0 | - |
| Stage 2 | - | - | - | - | - | - | 348 | 0 | - |

| Approach | EB | WB | SB |
|----------------------|----|-----|------|
| HCM Control Delay, s | 0 | 1.6 | 28.4 |
| HCM LOS | | | D |

| Minor Lane/Major Mvmt | EBT | EBR | WBL | WBT | SBLn1 | SBLn2 |
|-----------------------|-----|-----|-------|-----|-------|-------|
| Capacity (veh/h) | - | - | 684 | - | 90 | 495 |
| HCM Lane V/C Ratio | - | - | 0.142 | - | 0.478 | 0.543 |
| HCM Control Delay (s) | - | - | 11.1 | - | 77.2 | 20.6 |
| HCM Lane LOS | - | - | B | - | F | C |
| HCM 95th %tile Q(veh) | - | - | 0.5 | - | 2 | 3.2 |

























| Intersection | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh | 31 | | | | | | | | | | | |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ↰ | ↑ | | | ↑ | ↰ | | ↰ | ↰ | | | |
| Traffic Vol, veh/h | 172 | 541 | 0 | 0 | 559 | 74 | 108 | 0 | 59 | 0 | 0 | 0 |
| Future Vol, veh/h | 172 | 541 | 0 | 0 | 559 | 74 | 108 | 0 | 59 | 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 | 250 | - | - | - | - | 250 | - | - | 175 | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 90 | 90 | 90 | 80 | 80 | 80 | 92 | 92 | 92 |
| Heavy Vehicles, % | 4 | 4 | 4 | 7 | 7 | 7 | 5 | 5 | 5 | 2 | 2 | 2 |
| Mvmt Flow | 185 | 582 | 0 | 0 | 621 | 82 | 135 | 0 | 74 | 0 | 0 | 0 |

| Major/Minor | Major1 | | Major2 | | Minor1 | | | | | | | |
|----------------------|--------|---|--------|---|--------|---|-------|-------|-------|--|--|--|
| Conflicting Flow All | 703 | 0 | - | - | - | 0 | 1614 | 1655 | 582 | | | |
| Stage 1 | - | - | - | - | - | - | 952 | 952 | - | | | |
| Stage 2 | - | - | - | - | - | - | 662 | 703 | - | | | |
| Critical Hdwy | 4.14 | - | - | - | - | - | 6.45 | 6.55 | 6.25 | | | |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 5.45 | 5.55 | - | | | |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 5.45 | 5.55 | - | | | |
| Follow-up Hdwy | 2.236 | - | - | - | - | - | 3.545 | 4.045 | 3.345 | | | |
| Pot Cap-1 Maneuver | 885 | - | 0 | 0 | - | - | ~ 112 | 97 | 507 | | | |
| Stage 1 | - | - | 0 | 0 | - | - | 370 | 334 | - | | | |
| Stage 2 | - | - | 0 | 0 | - | - | 507 | 436 | - | | | |
| Platoon blocked, % | | - | | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 885 | - | - | - | - | - | ~ 89 | 0 | 507 | | | |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | ~ 89 | 0 | - | | | |
| Stage 1 | - | - | - | - | - | - | 293 | 0 | - | | | |
| Stage 2 | - | - | - | - | - | - | 507 | 0 | - | | | |

| Approach | EB | WB | NB |
|----------------------|-----|----|-------|
| HCM Control Delay, s | 2.4 | 0 | 240.5 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBL | EBT | WBT | WBR |
|-----------------------|----------|-------|-------|-----|-----|-----|
| Capacity (veh/h) | 89 | 507 | 885 | - | - | - |
| HCM Lane V/C Ratio | 1.517 | 0.145 | 0.209 | - | - | - |
| HCM Control Delay (s) | \$ 364.6 | 13.3 | 10.1 | - | - | - |
| HCM Lane LOS | F | B | B | - | - | - |
| HCM 95th %tile Q(veh) | 10.5 | 0.5 | 0.8 | - | - | - |

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

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 158 | 296 | 146 | 184 | 313 | 34 | 156 | 526 | 240 | 15 | 687 | 164 |
| Future Volume (vph) | 158 | 296 | 146 | 184 | 313 | 34 | 156 | 526 | 240 | 15 | 687 | 164 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 4.0 | 4.0 | 3.0 | 5.0 | 5.0 | 4.0 | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.5 | 32.0 | 32.0 | 9.5 | 32.0 | 32.0 | 9.5 | 40.0 | 40.0 | 9.5 | 29.0 | 29.0 |
| Total Split (s) | 21.0 | 27.0 | 27.0 | 14.0 | 20.0 | 20.0 | 12.0 | 67.0 | 67.0 | 12.0 | 67.0 | 67.0 |
| Total Split (%) | 17.5% | 22.5% | 22.5% | 11.7% | 16.7% | 16.7% | 10.0% | 55.8% | 55.8% | 10.0% | 55.8% | 55.8% |
| Yellow Time (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120









Actuated Cycle Length: 120













Offset: 108.5 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 95

Control Type: Actuated-Coordinated

Splits and Phases: 3: Gun Club Road & Jewell Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 12 s | 67 s | 14 s | 27 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 12 s | 67 s | 21 s | 20 s |

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 168 | 315 | 155 | 190 | 323 | 35 | 173 | 584 | 267 | 16 | 723 | 173 |
| v/c Ratio | 0.74 | 0.94 | 0.38 | 0.99 | 1.09 | 0.09 | 0.68 | 0.58 | 0.27 | 0.04 | 0.76 | 0.19 |
| Control Delay | 52.8 | 85.6 | 9.3 | 102.8 | 126.4 | 0.5 | 25.2 | 20.5 | 2.6 | 9.3 | 29.9 | 2.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 52.8 | 85.6 | 9.3 | 102.8 | 126.4 | 0.5 | 25.2 | 20.5 | 2.6 | 9.3 | 29.9 | 2.8 |
| Queue Length 50th (ft) | 101 | 243 | 0 | 116 | ~284 | 0 | 54 | 248 | 0 | 5 | 433 | 0 |
| Queue Length 95th (ft) | 163 | #420 | 58 | #273 | #520 | 0 | #98 | 445 | 42 | 13 | 595 | 35 |
| Internal Link Dist (ft) | | 2523 | | | 1479 | | | 2542 | | | 790 | |
| Turn Bay Length (ft) | 220 | | 330 | 300 | | | 485 | | 360 | 200 | | 325 |
| Base Capacity (vph) | 286 | 334 | 411 | 191 | 296 | 389 | 256 | 1012 | 975 | 424 | 956 | 897 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.59 | 0.94 | 0.38 | 0.99 | 1.09 | 0.09 | 0.68 | 0.58 | 0.27 | 0.04 | 0.76 | 0.19 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

























Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary

11/22/2023

3: Gun Club Road & Jewell Avenue

2023 Existing - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 158 | 296 | 146 | 184 | 313 | 34 | 156 | 526 | 240 | 15 | 687 | 164 |
| Future Volume (veh/h) | 158 | 296 | 146 | 184 | 313 | 34 | 156 | 526 | 240 | 15 | 687 | 164 |
| 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 | 1841 | 1841 | 1841 | 1841 | 1841 | 1841 | 1796 | 1796 | 1796 | 1885 | 1885 | 1885 |
| Adj Flow Rate, veh/h | 168 | 315 | 155 | 190 | 323 | 35 | 173 | 584 | 267 | 16 | 723 | 173 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.97 | 0.97 | 0.97 | 0.90 | 0.90 | 0.90 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 1 | 1 | 1 |
| Cap, veh/h | 227 | 337 | 286 | 205 | 301 | 255 | 281 | 993 | 842 | 305 | 958 | 812 |
| Arrive On Green | 0.10 | 0.18 | 0.18 | 0.08 | 0.16 | 0.16 | 0.06 | 0.55 | 0.55 | 0.01 | 0.51 | 0.51 |
| Sat Flow, veh/h | 1753 | 1841 | 1560 | 1753 | 1841 | 1560 | 1711 | 1796 | 1522 | 1795 | 1885 | 1598 |
| Grp Volume(v), veh/h | 168 | 315 | 155 | 190 | 323 | 35 | 173 | 584 | 267 | 16 | 723 | 173 |
| Grp Sat Flow(s),veh/h/ln | 1753 | 1841 | 1560 | 1753 | 1841 | 1560 | 1711 | 1796 | 1522 | 1795 | 1885 | 1598 |
| Q Serve(g_s), s | 9.4 | 20.2 | 10.8 | 9.0 | 19.6 | 2.3 | 5.6 | 25.8 | 11.4 | 0.5 | 36.7 | 7.2 |
| Cycle Q Clear(g_c), s | 9.4 | 20.2 | 10.8 | 9.0 | 19.6 | 2.3 | 5.6 | 25.8 | 11.4 | 0.5 | 36.7 | 7.2 |
| 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 | 227 | 337 | 286 | 205 | 301 | 255 | 281 | 993 | 842 | 305 | 958 | 812 |
| V/C Ratio(X) | 0.74 | 0.93 | 0.54 | 0.93 | 1.07 | 0.14 | 0.62 | 0.59 | 0.32 | 0.05 | 0.75 | 0.21 |
| Avail Cap(c_a), veh/h | 294 | 337 | 286 | 205 | 301 | 255 | 281 | 993 | 842 | 385 | 958 | 812 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.1 | 48.3 | 44.4 | 43.3 | 50.2 | 43.0 | 20.4 | 17.8 | 14.5 | 15.6 | 23.5 | 16.3 |
| Incr Delay (d2), s/veh | 4.6 | 32.3 | 2.1 | 42.4 | 73.2 | 0.2 | 4.0 | 2.6 | 1.0 | 0.1 | 5.5 | 0.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.2 | 12.0 | 4.2 | 3.7 | 14.9 | 0.9 | 2.2 | 10.1 | 3.9 | 0.2 | 16.0 | 2.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 42.7 | 80.5 | 46.5 | 85.6 | 123.4 | 43.2 | 24.4 | 20.3 | 15.5 | 15.7 | 29.0 | 16.9 |
| LnGrp LOS | D | F | D | F | F | D | C | C | B | B | C | B |
| Approach Vol, veh/h | 638 | | | 548 | | | 1024 | | | 912 | | |
| Approach Delay, s/veh | 62.3 | | | 105.2 | | | 19.8 | | | 26.5 | | |
| Approach LOS | E | | | F | | | B | | | C | | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 6.7 | 72.3 | 14.0 | 27.0 | 12.0 | 67.0 | 16.4 | 24.6 | | | | |
| 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 | 7.0 | 61.0 | 9.0 | 22.0 | 7.0 | 61.0 | 16.0 | 15.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.5 | 27.8 | 11.0 | 22.2 | 7.6 | 38.7 | 11.4 | 21.6 | | | | |
| Green Ext Time (p_c), s | 0.0 | 13.4 | 0.0 | 0.0 | 0.0 | 12.2 | 0.0 | 0.0 | | | | |

Intersection Summary

HCM 6th Ctrl Delay 45.4

HCM 6th LOS D

Notes

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

***Intersection Capacity Worksheets:
2023 Existing
with Improvements***

| | → | ↘ | ↙ | ← | ↓ | ↗ |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Configurations | ↑ | ↗ | ↙ | ↑ | ↖ | ↗ |
| Traffic Volume (vph) | 537 | 160 | 112 | 698 | 1 | 168 |
| Future Volume (vph) | 537 | 160 | 112 | 698 | 1 | 168 |
| Turn Type | NA | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 3 | 8 | 6 | |
| Permitted Phases | | 4 | 8 | | | 6 |
| Detector Phase | 4 | 4 | 3 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.0 | 25.0 | 10.0 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 50.0 | 50.0 | 13.0 | 63.0 | 27.0 | 27.0 |
| Total Split (%) | 55.6% | 55.6% | 14.4% | 70.0% | 30.0% | 30.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Max | C-Max | None | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90

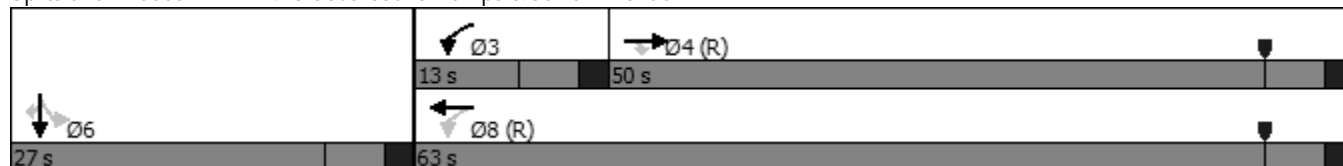
Actuated Cycle Length: 90







Offset: 68 (76%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow

Natural Cycle: 65

Control Type: Actuated-Coordinated

Splits and Phases: 1: E-470 Southbound Ramps & Jewell Avenue















| |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Group Flow (vph) | 565 | 168 | 126 | 784 | 45 | 193 |
| v/c Ratio | 0.62 | 0.20 | 0.31 | 0.66 | 0.12 | 0.41 |
| Control Delay | 20.7 | 2.7 | 6.1 | 7.6 | 28.4 | 7.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay | 20.7 | 2.7 | 6.1 | 7.8 | 28.4 | 7.4 |
| Queue Length 50th (ft) | 227 | 0 | 18 | 112 | 20 | 0 |
| Queue Length 95th (ft) | 336 | 31 | m25 | 143 | 47 | 48 |
| Internal Link Dist (ft) | 679 | | | 530 | 532 | |
| Turn Bay Length (ft) | | 300 | 250 | | | |
| Base Capacity (vph) | 906 | 855 | 413 | 1191 | 361 | 469 |
| Starvation Cap Reductn | 0 | 0 | 0 | 60 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.62 | 0.20 | 0.31 | 0.69 | 0.12 | 0.41 |
| Intersection Summary | | | | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | | | | |

HCM 6th Signalized Intersection Summary

11/22/2023













1: E-470 Southbound Ramps & Jewell Avenue

2023 Existing (with Improvements) - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↑ | ↗ | ↖ | ↑ | | | | | | ↖ | ↗ |
| Traffic Volume (veh/h) | 0 | 537 | 160 | 112 | 698 | 0 | 0 | 0 | 0 | 38 | 1 | 168 |
| Future Volume (veh/h) | 0 | 537 | 160 | 112 | 698 | 0 | 0 | 0 | 0 | 38 | 1 | 168 |
| Initial Q (Qb), veh | 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 |
| Parking Bus, Adj | 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 | |
| Adj Sat Flow, veh/h/ln | 0 | 1856 | 1856 | 1885 | 1885 | 0 | | | | 1648 | 1841 | 1648 |
| Adj Flow Rate, veh/h | 0 | 565 | 168 | 126 | 784 | 0 | | | | 44 | 1 | 193 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.89 | 0.89 | 0.89 | | | | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 1 | 1 | 0 | | | | 17 | 4 | 17 |
| Cap, veh/h | 0 | 955 | 809 | 394 | 1194 | 0 | | | | 400 | 9 | 326 |
| Arrive On Green | 0.00 | 0.51 | 0.51 | 0.10 | 1.00 | 0.00 | | | | 0.23 | 0.23 | 0.23 |
| Sat Flow, veh/h | 0 | 1856 | 1572 | 1795 | 1885 | 0 | | | | 1716 | 39 | 1397 |
| Grp Volume(v), veh/h | 0 | 565 | 168 | 126 | 784 | 0 | | | | 45 | 0 | 193 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1856 | 1572 | 1795 | 1885 | 0 | | | | 1755 | 0 | 1397 |
| Q Serve(g_s), s | 0.0 | 19.1 | 5.2 | 2.9 | 0.0 | 0.0 | | | | 1.8 | 0.0 | 11.1 |
| Cycle Q Clear(g_c), s | 0.0 | 19.1 | 5.2 | 2.9 | 0.0 | 0.0 | | | | 1.8 | 0.0 | 11.1 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 0.00 | | | | 0.98 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 955 | 809 | 394 | 1194 | 0 | | | | 409 | 0 | 326 |
| V/C Ratio(X) | 0.00 | 0.59 | 0.21 | 0.32 | 0.66 | 0.00 | | | | 0.11 | 0.00 | 0.59 |
| Avail Cap(c_a), veh/h | 0 | 955 | 809 | 440 | 1194 | 0 | | | | 409 | 0 | 326 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(l) | 0.00 | 1.00 | 1.00 | 0.50 | 0.50 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 15.3 | 11.9 | 10.5 | 0.0 | 0.0 | | | | 27.1 | 0.0 | 30.7 |
| Incr Delay (d2), s/veh | 0.0 | 2.7 | 0.6 | 0.2 | 1.4 | 0.0 | | | | 0.5 | 0.0 | 7.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 7.7 | 1.7 | 0.9 | 0.5 | 0.0 | | | | 0.8 | 0.0 | 4.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 17.9 | 12.5 | 10.8 | 1.4 | 0.0 | | | | 27.7 | 0.0 | 38.4 |
| LnGrp LOS | A | B | B | B | A | A | | | | C | A | D |
| Approach Vol, veh/h | | 733 | | | 910 | | | | | | 238 | |
| Approach Delay, s/veh | | 16.7 | | | 2.7 | | | | | | 36.4 | |
| Approach LOS | | B | | | A | | | | | | D | |
| Timer - Assigned Phs | | | 3 | 4 | | 6 | | | 8 | | | |
| Phs Duration (G+Y+Rc), s | | | 10.7 | 52.3 | | 27.0 | | | 63.0 | | | |
| Change Period (Y+Rc), s | | | 6.0 | 6.0 | | 6.0 | | | 6.0 | | | |
| Max Green Setting (Gmax), s | | | 7.0 | 44.0 | | 21.0 | | | 57.0 | | | |
| Max Q Clear Time (g_c+I1), s | | | 4.9 | 21.1 | | 13.1 | | | 2.0 | | | |
| Green Ext Time (p_c), s | | | 0.1 | 3.9 | | 0.5 | | | 6.1 | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 12.4 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

Timings
11/22/2023

2: E-470 Northbound Ramps & Jewell Avenue
2023 Existing (with Improvements) - AM Peak Hour

| |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
| Lane Configurations |  |  |  |  |  |  |
| Traffic Volume (vph) | 198 | 377 | 636 | 49 | 0 | 44 |
| Future Volume (vph) | 198 | 377 | 636 | 49 | 0 | 44 |
| Turn Type | pm+pt | NA | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 8 | | 2 | |
| Permitted Phases | 4 | | | 8 | | 2 |
| Detector Phase | 7 | 4 | 8 | 8 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 3.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.5 | 25.0 | 25.0 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 13.0 | 63.0 | 50.0 | 50.0 | 27.0 | 27.0 |
| Total Split (%) | 14.4% | 70.0% | 55.6% | 55.6% | 30.0% | 30.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Recall Mode | None | C-Max | C-Max | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90





Actuated Cycle Length: 90

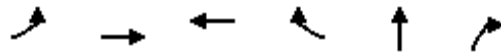
Offset: 60 (67%), Referenced to phase 4:EBTL and 8:WBT, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 2: E-470 Northbound Ramps & Jewell Avenue

| | | |
|--|--|--|
|  Ø2 |  Ø4 (R) | |
| 27 s | 63 s | |
| |  Ø7 |  Ø8 (R) |
| | 13 s | 50 s |



| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
|-------------------------|------|------|------|------|------|------|
| Lane Group Flow (vph) | 208 | 397 | 723 | 56 | 200 | 51 |
| v/c Ratio | 0.73 | 0.35 | 0.80 | 0.07 | 0.49 | 0.11 |
| Control Delay | 40.0 | 6.9 | 27.8 | 0.5 | 34.7 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 40.0 | 6.9 | 27.8 | 0.5 | 34.7 | 0.5 |
| Queue Length 50th (ft) | 79 | 60 | 331 | 0 | 99 | 0 |
| Queue Length 95th (ft) | #175 | 109 | 471 | 3 | 160 | 0 |
| Internal Link Dist (ft) | | 530 | 2523 | | 717 | |
| Turn Bay Length (ft) | 250 | | | 250 | | 175 |
| Base Capacity (vph) | 283 | 1146 | 902 | 822 | 408 | 449 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.73 | 0.35 | 0.80 | 0.07 | 0.49 | 0.11 |

Intersection Summary



















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

























HCM 6th Signalized Intersection Summary

2: E-470 Northbound Ramps & Jewell Avenue

11/22/2023

2023 Existing (with Improvements) - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | | |  |  | |  |  | | | |
| Traffic Volume (veh/h) | 198 | 377 | 0 | 0 | 636 | 49 | 174 | 0 | 44 | 0 | 0 | 0 |
| Future Volume (veh/h) | 198 | 377 | 0 | 0 | 636 | 49 | 174 | 0 | 44 | 0 | 0 | 0 |
| Initial Q (Qb), veh | 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 | | | |
| Parking Bus, Adj | 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 | | | | | |
| Adj Sat Flow, veh/h/ln | 1826 | 1826 | 0 | 0 | 1856 | 1856 | 1856 | 1856 | 1856 | | | |
| Adj Flow Rate, veh/h | 208 | 397 | 0 | 0 | 723 | 56 | 200 | 0 | 51 | | | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.88 | 0.88 | 0.88 | 0.87 | 0.87 | 0.87 | | | |
| Percent Heavy Veh, % | 5 | 5 | 0 | 0 | 3 | 3 | 3 | 3 | 3 | | | |
| Cap, veh/h | 325 | 1156 | 0 | 0 | 907 | 769 | 412 | 0 | 367 | | | |
| Arrive On Green | 0.16 | 1.00 | 0.00 | 0.00 | 0.49 | 0.49 | 0.23 | 0.00 | 0.23 | | | |
| Sat Flow, veh/h | 1739 | 1826 | 0 | 0 | 1856 | 1572 | 1767 | 0 | 1572 | | | |
| Grp Volume(v), veh/h | 208 | 397 | 0 | 0 | 723 | 56 | 200 | 0 | 51 | | | |
| Grp Sat Flow(s),veh/h/ln | 1739 | 1826 | 0 | 0 | 1856 | 1572 | 1767 | 0 | 1572 | | | |
| Q Serve(g_s), s | 5.3 | 0.0 | 0.0 | 0.0 | 29.4 | 1.7 | 8.8 | 0.0 | 2.3 | | | |
| Cycle Q Clear(g_c), s | 5.3 | 0.0 | 0.0 | 0.0 | 29.4 | 1.7 | 8.8 | 0.0 | 2.3 | | | |
| Prop In Lane | 1.00 | | 0.00 | 0.00 | | 1.00 | 1.00 | | 1.00 | | | |
| Lane Grp Cap(c), veh/h | 325 | 1156 | 0 | 0 | 907 | 769 | 412 | 0 | 367 | | | |
| V/C Ratio(X) | 0.64 | 0.34 | 0.00 | 0.00 | 0.80 | 0.07 | 0.49 | 0.00 | 0.14 | | | |
| Avail Cap(c_a), veh/h | 325 | 1156 | 0 | 0 | 907 | 769 | 412 | 0 | 367 | | | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | |
| Upstream Filter(I) | 0.74 | 0.74 | 0.00 | 0.00 | 0.66 | 0.66 | 1.00 | 0.00 | 1.00 | | | |
| Uniform Delay (d), s/veh | 14.9 | 0.0 | 0.0 | 0.0 | 19.3 | 12.2 | 29.8 | 0.0 | 27.3 | | | |
| Incr Delay (d2), s/veh | 3.1 | 0.6 | 0.0 | 0.0 | 4.9 | 0.1 | 4.0 | 0.0 | 0.8 | | | |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | |
| %ile BackOfQ(50%),veh/ln | 1.7 | 0.2 | 0.0 | 0.0 | 12.1 | 0.6 | 4.1 | 0.0 | 0.9 | | | |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 18.0 | 0.6 | 0.0 | 0.0 | 24.1 | 12.3 | 33.9 | 0.0 | 28.1 | | | |
| LnGrp LOS | B | A | A | A | C | B | C | A | C | | | |
| Approach Vol, veh/h | 605 | | | 779 | | | 251 | | | | | |
| Approach Delay, s/veh | 6.6 | | | 23.3 | | | 32.7 | | | | | |
| Approach LOS | A | | | C | | | C | | | | | |
| Timer - Assigned Phs | 2 | | | 4 | | | 7 | | | 8 | | |
| Phs Duration (G+Y+Rc), s | 27.0 | | | 63.0 | | | 13.0 | | | 50.0 | | |
| Change Period (Y+Rc), s | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | | |
| Max Green Setting (Gmax), s | 21.0 | | | 57.0 | | | 7.0 | | | 44.0 | | |
| Max Q Clear Time (g_c+I1), s | 10.8 | | | 2.0 | | | 7.3 | | | 31.4 | | |
| Green Ext Time (p_c), s | 0.9 | | | 2.4 | | | 0.0 | | | 3.9 | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | 18.6 | | | | | | | | | | | |
| HCM 6th LOS | B | | | | | | | | | | | |

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 131 | 218 | 72 | 199 | 341 | 40 | 193 | 515 | 80 | 34 | 430 | 151 |
| Future Volume (vph) | 131 | 218 | 72 | 199 | 341 | 40 | 193 | 515 | 80 | 34 | 430 | 151 |
| Turn Type | pm+pt | NA | pm+ov | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 5 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 5 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 4.0 | 4.0 | 3.0 | 5.0 | 5.0 | 4.0 | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.5 | 32.0 | 9.5 | 9.5 | 32.0 | 32.0 | 9.5 | 40.0 | 40.0 | 9.5 | 29.0 | 29.0 |
| Total Split (s) | 13.0 | 28.0 | 23.0 | 21.0 | 36.0 | 36.0 | 23.0 | 53.0 | 53.0 | 18.0 | 48.0 | 48.0 |
| Total Split (%) | 10.8% | 23.3% | 19.2% | 17.5% | 30.0% | 30.0% | 19.2% | 44.2% | 44.2% | 15.0% | 40.0% | 40.0% |
| Yellow Time (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120









Actuated Cycle Length: 120













Offset: 108.5 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 95

Control Type: Actuated-Coordinated

Splits and Phases: 3: Gun Club Road & Jewell Avenue

| | | | |
|---|---|--|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 18 s | 53 s | 21 s | 28 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 23 s | 48 s | 13 s | 36 s |

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 138 | 229 | 76 | 229 | 392 | 46 | 297 | 792 | 123 | 39 | 494 | 174 |
| v/c Ratio | 0.80 | 0.68 | 0.12 | 0.70 | 0.88 | 0.10 | 0.70 | 0.85 | 0.14 | 0.21 | 0.68 | 0.24 |
| Control Delay | 62.4 | 56.1 | 1.6 | 41.6 | 66.1 | 0.4 | 23.2 | 38.2 | 1.8 | 16.2 | 37.7 | 4.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 62.4 | 56.1 | 1.6 | 41.6 | 66.1 | 0.4 | 23.2 | 38.2 | 1.8 | 16.2 | 37.7 | 4.8 |
| Queue Length 50th (ft) | 73 | 162 | 0 | 128 | 287 | 0 | 119 | 580 | 0 | 13 | 331 | 0 |
| Queue Length 95th (ft) | #155 | 255 | 11 | 189 | #412 | 0 | 118 | 463 | 0 | 29 | 451 | 43 |
| Internal Link Dist (ft) | 2523 | | | 1479 | | | 2542 | | | 790 | | |
| Turn Bay Length (ft) | 220 | | 330 | 300 | | | 485 | | 360 | 200 | | 325 |
| Base Capacity (vph) | 178 | 350 | 653 | 353 | 481 | 496 | 453 | 937 | 873 | 279 | 722 | 719 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.78 | 0.65 | 0.12 | 0.65 | 0.81 | 0.09 | 0.66 | 0.85 | 0.14 | 0.14 | 0.68 | 0.24 |

Intersection Summary

























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

HCM 6th Signalized Intersection Summary

11/22/2023

3: Gun Club Road & Jewell Avenue

2023 Existing (with Improvements) - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 131 | 218 | 72 | 199 | 341 | 40 | 193 | 515 | 80 | 34 | 430 | 151 |
| Future Volume (veh/h) | 131 | 218 | 72 | 199 | 341 | 40 | 193 | 515 | 80 | 34 | 430 | 151 |
| 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 | 1811 | 1811 | 1811 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1841 | 1841 | 1841 |
| Adj Flow Rate, veh/h | 138 | 229 | 76 | 229 | 392 | 46 | 297 | 792 | 123 | 39 | 494 | 174 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.87 | 0.87 | 0.87 | 0.65 | 0.65 | 0.65 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 6 | 6 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 |
| Cap, veh/h | 198 | 321 | 442 | 333 | 428 | 363 | 415 | 945 | 801 | 188 | 771 | 653 |
| Arrive On Green | 0.07 | 0.18 | 0.18 | 0.12 | 0.23 | 0.23 | 0.11 | 0.51 | 0.51 | 0.02 | 0.42 | 0.42 |
| Sat Flow, veh/h | 1725 | 1811 | 1535 | 1781 | 1870 | 1585 | 1781 | 1870 | 1585 | 1753 | 1841 | 1560 |
| Grp Volume(v), veh/h | 138 | 229 | 76 | 229 | 392 | 46 | 297 | 792 | 123 | 39 | 494 | 174 |
| Grp Sat Flow(s),veh/h/ln | 1725 | 1811 | 1535 | 1781 | 1870 | 1585 | 1781 | 1870 | 1585 | 1753 | 1841 | 1560 |
| Q Serve(g_s), s | 7.9 | 14.3 | 4.5 | 12.2 | 24.5 | 2.8 | 10.9 | 43.6 | 5.0 | 1.5 | 25.6 | 8.8 |
| Cycle Q Clear(g_c), s | 7.9 | 14.3 | 4.5 | 12.2 | 24.5 | 2.8 | 10.9 | 43.6 | 5.0 | 1.5 | 25.6 | 8.8 |
| 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 | 198 | 321 | 442 | 333 | 428 | 363 | 415 | 945 | 801 | 188 | 771 | 653 |
| V/C Ratio(X) | 0.70 | 0.71 | 0.17 | 0.69 | 0.92 | 0.13 | 0.72 | 0.84 | 0.15 | 0.21 | 0.64 | 0.27 |
| Avail Cap(c_a), veh/h | 198 | 347 | 464 | 360 | 483 | 409 | 485 | 945 | 801 | 335 | 771 | 653 |
| 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) | 0.96 | 0.96 | 0.96 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.9 | 46.5 | 32.0 | 34.0 | 45.1 | 36.7 | 20.0 | 25.5 | 15.9 | 24.0 | 27.7 | 22.8 |
| Incr Delay (d2), s/veh | 8.5 | 6.0 | 0.2 | 3.8 | 20.8 | 0.2 | 4.1 | 8.8 | 0.4 | 0.5 | 4.1 | 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(50%),veh/ln | 3.7 | 6.8 | 1.6 | 5.4 | 13.5 | 1.1 | 4.4 | 19.4 | 1.8 | 0.6 | 11.3 | 3.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 47.4 | 52.4 | 32.2 | 37.8 | 65.9 | 36.9 | 24.1 | 34.3 | 16.3 | 24.5 | 31.8 | 23.8 |
| LnGrp LOS | D | D | C | D | E | D | C | C | B | C | C | C |
| Approach Vol, veh/h | | 443 | | | 667 | | | 1212 | | | 707 | |
| Approach Delay, s/veh | | 47.4 | | | 54.2 | | | 30.0 | | | 29.4 | |
| Approach LOS | | D | | | D | | | C | | | C | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 7.9 | 66.6 | 19.2 | 26.3 | 18.3 | 56.2 | 13.0 | 32.5 | | | | |
| 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 | 13.0 | 47.0 | 16.0 | 23.0 | 18.0 | 42.0 | 8.0 | 31.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.5 | 45.6 | 14.2 | 16.3 | 12.9 | 27.6 | 9.9 | 26.5 | | | | |
| Green Ext Time (p_c), s | 0.0 | 1.1 | 0.0 | 0.7 | 0.4 | 6.5 | 0.0 | 0.9 | | | | |

Intersection Summary

| | |
|--------------------|------|
| HCM 6th Ctrl Delay | 37.7 |
| HCM 6th LOS | D |

Notes

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

Timings
11/22/2023

1: E-470 Southbound Ramps & Jewell Avenue
2023 Existing (with Improvements) - PM Peak Hour

| | → | ↘ | ↙ | ← | ↓ | ↗ |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Configurations | ↑ | ↗ | ↙ | ↑ | ↘ | ↗ |
| Traffic Volume (vph) | 679 | 283 | 93 | 574 | 3 | 231 |
| Future Volume (vph) | 679 | 283 | 93 | 574 | 3 | 231 |
| Turn Type | NA | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 3 | 8 | 6 | |
| Permitted Phases | | 4 | 8 | | | 6 |
| Detector Phase | 4 | 4 | 3 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.0 | 25.0 | 12.5 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 50.5 | 50.5 | 12.5 | 63.0 | 27.0 | 27.0 |
| Total Split (%) | 56.1% | 56.1% | 13.9% | 70.0% | 30.0% | 30.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Max | C-Max | None | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90

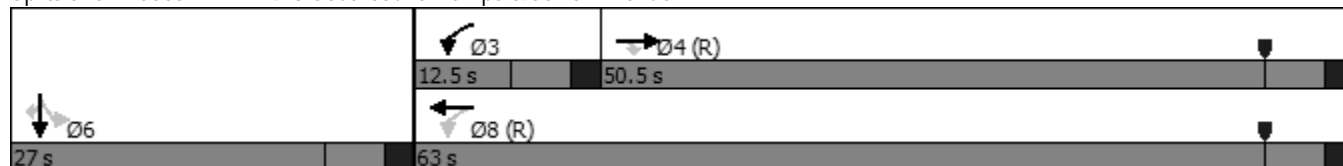
Actuated Cycle Length: 90







Offset: 83 (92%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 1: E-470 Southbound Ramps & Jewell Avenue















| |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Group Flow (vph) | 715 | 298 | 97 | 598 | 43 | 269 |
| v/c Ratio | 0.73 | 0.31 | 0.32 | 0.51 | 0.11 | 0.48 |
| Control Delay | 23.4 | 2.5 | 9.5 | 10.1 | 28.1 | 7.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 23.4 | 2.5 | 9.5 | 10.1 | 28.1 | 7.0 |
| Queue Length 50th (ft) | 319 | 0 | 18 | 117 | 19 | 0 |
| Queue Length 95th (ft) | 472 | 40 | m38 | 236 | 44 | 51 |
| Internal Link Dist (ft) | 679 | | | 530 | 532 | |
| Turn Bay Length (ft) | | 300 | 250 | | | |
| Base Capacity (vph) | 973 | 969 | 307 | 1179 | 399 | 561 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.73 | 0.31 | 0.32 | 0.51 | 0.11 | 0.48 |
| Intersection Summary | | | | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | | | | |

HCM 6th Signalized Intersection Summary

11/22/2023













1: E-470 Southbound Ramps & Jewell Avenue

2023 Existing (with Improvements) - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↑ | ↗ | ↖ | ↑ | | | | | | ↖ | ↗ |
| Traffic Volume (veh/h) | 0 | 679 | 283 | 93 | 574 | 0 | 0 | 0 | 0 | 34 | 3 | 231 |
| Future Volume (veh/h) | 0 | 679 | 283 | 93 | 574 | 0 | 0 | 0 | 0 | 34 | 3 | 231 |
| Initial Q (Qb), veh | 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 |
| Parking Bus, Adj | 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 | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 1870 | 1870 | 0 | | | | 1811 | 1811 | 1811 |
| Adj Flow Rate, veh/h | 0 | 715 | 298 | 97 | 598 | 0 | | | | 40 | 3 | 269 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.96 | 0.96 | 0.96 | | | | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 0 | | | | 6 | 6 | 6 |
| Cap, veh/h | 0 | 980 | 831 | 284 | 1185 | 0 | | | | 376 | 28 | 358 |
| Arrive On Green | 0.00 | 0.52 | 0.52 | 0.09 | 1.00 | 0.00 | | | | 0.23 | 0.23 | 0.23 |
| Sat Flow, veh/h | 0 | 1870 | 1585 | 1781 | 1870 | 0 | | | | 1610 | 121 | 1535 |
| Grp Volume(v), veh/h | 0 | 715 | 298 | 97 | 598 | 0 | | | | 43 | 0 | 269 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1870 | 1585 | 1781 | 1870 | 0 | | | | 1731 | 0 | 1535 |
| Q Serve(g_s), s | 0.0 | 26.5 | 9.9 | 2.2 | 0.0 | 0.0 | | | | 1.8 | 0.0 | 14.7 |
| Cycle Q Clear(g_c), s | 0.0 | 26.5 | 9.9 | 2.2 | 0.0 | 0.0 | | | | 1.8 | 0.0 | 14.7 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 0.00 | | | | 0.93 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 980 | 831 | 284 | 1185 | 0 | | | | 404 | 0 | 358 |
| V/C Ratio(X) | 0.00 | 0.73 | 0.36 | 0.34 | 0.50 | 0.00 | | | | 0.11 | 0.00 | 0.75 |
| Avail Cap(c_a), veh/h | 0 | 980 | 831 | 336 | 1185 | 0 | | | | 404 | 0 | 358 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.59 | 0.59 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 16.5 | 12.5 | 12.9 | 0.0 | 0.0 | | | | 27.1 | 0.0 | 32.1 |
| Incr Delay (d2), s/veh | 0.0 | 4.8 | 1.2 | 0.4 | 0.9 | 0.0 | | | | 0.5 | 0.0 | 13.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 11.0 | 3.3 | 0.7 | 0.3 | 0.0 | | | | 0.8 | 0.0 | 6.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 21.3 | 13.8 | 13.3 | 0.9 | 0.0 | | | | 27.7 | 0.0 | 45.6 |
| LnGrp LOS | A | C | B | B | A | A | | | | C | A | D |
| Approach Vol, veh/h | | 1013 | | | 695 | | | | | | 312 | |
| Approach Delay, s/veh | | 19.1 | | | 2.6 | | | | | | 43.1 | |
| Approach LOS | | B | | | A | | | | | | D | |
| Timer - Assigned Phs | | | 3 | 4 | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | | | 9.8 | 53.2 | | 27.0 | | 63.0 | | | | |
| Change Period (Y+Rc), s | | | 6.0 | 6.0 | | 6.0 | | 6.0 | | | | |
| Max Green Setting (Gmax), s | | | 6.5 | 44.5 | | 21.0 | | 57.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | | 4.2 | 28.5 | | 16.7 | | 2.0 | | | | |
| Green Ext Time (p_c), s | | | 0.0 | 5.1 | | 0.5 | | 4.0 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 17.1 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

Timings
11/22/2023

2: E-470 Northbound Ramps & Jewell Avenue
2023 Existing (with Improvements) - PM Peak Hour

| |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
| Lane Configurations |  |  |  |  |  |  |
| Traffic Volume (vph) | 172 | 541 | 559 | 74 | 0 | 59 |
| Future Volume (vph) | 172 | 541 | 559 | 74 | 0 | 59 |
| Turn Type | pm+pt | NA | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 8 | | 2 | |
| Permitted Phases | 4 | | | 8 | | 2 |
| Detector Phase | 7 | 4 | 8 | 8 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 3.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.5 | 25.0 | 25.0 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 15.0 | 63.0 | 48.0 | 48.0 | 27.0 | 27.0 |
| Total Split (%) | 16.7% | 70.0% | 53.3% | 53.3% | 30.0% | 30.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Recall Mode | None | C-Max | C-Max | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90





Actuated Cycle Length: 90

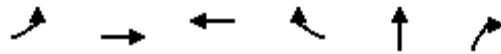
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 2: E-470 Northbound Ramps & Jewell Avenue

| | | |
|--|--|--|
|  Ø2 |  Ø4 (R) | |
| 27 s | 63 s | |
| |  Ø7 |  Ø8 (R) |
| | 15 s | 48 s |



| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
|-------------------------|------|------|------|------|------|------|
| Lane Group Flow (vph) | 185 | 582 | 621 | 82 | 135 | 74 |
| v/c Ratio | 0.50 | 0.50 | 0.74 | 0.11 | 0.34 | 0.17 |
| Control Delay | 13.8 | 3.3 | 26.0 | 1.9 | 31.6 | 3.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 13.8 | 3.3 | 26.0 | 1.9 | 31.6 | 3.4 |
| Queue Length 50th (ft) | 12 | 29 | 279 | 0 | 64 | 0 |
| Queue Length 95th (ft) | m47 | 48 | 417 | 15 | 102 | 9 |
| Internal Link Dist (ft) | | 530 | 2523 | | 717 | |
| Turn Bay Length (ft) | 250 | | | 250 | | 175 |
| Base Capacity (vph) | 377 | 1157 | 839 | 771 | 401 | 442 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.49 | 0.50 | 0.74 | 0.11 | 0.34 | 0.17 |

Intersection Summary



















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

HCM 6th Signalized Intersection Summary

2: E-470 Northbound Ramps & Jewell Avenue

11/22/2023

























2023 Existing (with Improvements) - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | | |  |  | |  |  | | | |
| Traffic Volume (veh/h) | 172 | 541 | 0 | 0 | 559 | 74 | 108 | 0 | 59 | 0 | 0 | 0 |
| Future Volume (veh/h) | 172 | 541 | 0 | 0 | 559 | 74 | 108 | 0 | 59 | 0 | 0 | 0 |
| Initial Q (Qb), veh | 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 | | | |
| Parking Bus, Adj | 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 | | | | | |
| Adj Sat Flow, veh/h/ln | 1841 | 1841 | 0 | 0 | 1796 | 1796 | 1826 | 1826 | 1826 | | | |
| Adj Flow Rate, veh/h | 185 | 582 | 0 | 0 | 621 | 82 | 135 | 0 | 74 | | | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.90 | 0.90 | 0.90 | 0.80 | 0.80 | 0.80 | | | |
| Percent Heavy Veh, % | 4 | 4 | 0 | 0 | 7 | 7 | 5 | 5 | 5 | | | |
| Cap, veh/h | 374 | 1166 | 0 | 0 | 886 | 751 | 406 | 0 | 361 | | | |
| Arrive On Green | 0.15 | 1.00 | 0.00 | 0.00 | 0.49 | 0.49 | 0.23 | 0.00 | 0.23 | | | |
| Sat Flow, veh/h | 1753 | 1841 | 0 | 0 | 1796 | 1522 | 1739 | 0 | 1547 | | | |
| Grp Volume(v), veh/h | 185 | 582 | 0 | 0 | 621 | 82 | 135 | 0 | 74 | | | |
| Grp Sat Flow(s),veh/h/ln | 1753 | 1841 | 0 | 0 | 1796 | 1522 | 1739 | 0 | 1547 | | | |
| Q Serve(g_s), s | 4.6 | 0.0 | 0.0 | 0.0 | 24.1 | 2.6 | 5.8 | 0.0 | 3.5 | | | |
| Cycle Q Clear(g_c), s | 4.6 | 0.0 | 0.0 | 0.0 | 24.1 | 2.6 | 5.8 | 0.0 | 3.5 | | | |
| Prop In Lane | 1.00 | | 0.00 | 0.00 | | 1.00 | 1.00 | | 1.00 | | | |
| Lane Grp Cap(c), veh/h | 374 | 1166 | 0 | 0 | 886 | 751 | 406 | 0 | 361 | | | |
| V/C Ratio(X) | 0.49 | 0.50 | 0.00 | 0.00 | 0.70 | 0.11 | 0.33 | 0.00 | 0.20 | | | |
| Avail Cap(c_a), veh/h | 420 | 1166 | 0 | 0 | 886 | 751 | 406 | 0 | 361 | | | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | |
| Upstream Filter(I) | 0.60 | 0.60 | 0.00 | 0.00 | 0.74 | 0.74 | 1.00 | 0.00 | 1.00 | | | |
| Uniform Delay (d), s/veh | 12.4 | 0.0 | 0.0 | 0.0 | 17.7 | 12.2 | 28.7 | 0.0 | 27.8 | | | |
| Incr Delay (d2), s/veh | 0.6 | 0.9 | 0.0 | 0.0 | 3.4 | 0.2 | 2.2 | 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 | | | |
| %ile BackOfQ(50%),veh/ln | 1.3 | 0.3 | 0.0 | 0.0 | 9.5 | 0.8 | 2.6 | 0.0 | 1.4 | | | |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 13.0 | 0.9 | 0.0 | 0.0 | 21.1 | 12.4 | 30.9 | 0.0 | 29.1 | | | |
| LnGrp LOS | B | A | A | A | C | B | C | A | C | | | |
| Approach Vol, veh/h | 767 | | | 703 | | | 209 | | | | | |
| Approach Delay, s/veh | 3.8 | | | 20.1 | | | 30.2 | | | | | |
| Approach LOS | A | | | C | | | C | | | | | |
| Timer - Assigned Phs | 2 | | | 4 | | | 7 | | | 8 | | |
| Phs Duration (G+Y+Rc), s | 27.0 | | | 63.0 | | | 12.6 | | | 50.4 | | |
| Change Period (Y+Rc), s | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | | |
| Max Green Setting (Gmax), s | 21.0 | | | 57.0 | | | 9.0 | | | 42.0 | | |
| Max Q Clear Time (g_c+I1), s | 7.8 | | | 2.0 | | | 6.6 | | | 26.1 | | |
| Green Ext Time (p_c), s | 0.8 | | | 3.9 | | | 0.1 | | | 3.6 | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | 13.9 | | | | | | | | | | | |
| HCM 6th LOS | B | | | | | | | | | | | |

Timings
11/22/2023

3: Gun Club Road & Jewell Avenue

2023 Existing (with Improvements) - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 158 | 296 | 146 | 184 | 313 | 34 | 156 | 526 | 240 | 15 | 687 | 164 |
| Future Volume (vph) | 158 | 296 | 146 | 184 | 313 | 34 | 156 | 526 | 240 | 15 | 687 | 164 |
| Turn Type | pm+pt | NA | pm+ov | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 5 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 5 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 4.0 | 4.0 | 3.0 | 5.0 | 5.0 | 4.0 | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.5 | 32.0 | 9.5 | 9.5 | 32.0 | 32.0 | 9.5 | 40.0 | 40.0 | 9.5 | 29.0 | 29.0 |
| Total Split (s) | 14.0 | 35.0 | 12.0 | 16.0 | 37.0 | 37.0 | 12.0 | 57.0 | 57.0 | 12.0 | 57.0 | 57.0 |
| Total Split (%) | 11.7% | 29.2% | 10.0% | 13.3% | 30.8% | 30.8% | 10.0% | 47.5% | 47.5% | 10.0% | 47.5% | 47.5% |
| Yellow Time (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120









Actuated Cycle Length: 120













Offset: 108.5 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 95

Control Type: Actuated-Coordinated

Splits and Phases: 3: Gun Club Road & Jewell Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 12 s | 57 s | 16 s | 35 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 12 s | 57 s | 14 s | 37 s |

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 168 | 315 | 155 | 190 | 323 | 35 | 173 | 584 | 267 | 16 | 723 | 173 |
| v/c Ratio | 0.76 | 0.83 | 0.25 | 0.81 | 0.79 | 0.08 | 0.74 | 0.62 | 0.29 | 0.04 | 0.89 | 0.22 |
| Control Delay | 51.8 | 63.3 | 7.9 | 55.3 | 58.1 | 0.4 | 43.4 | 25.9 | 3.3 | 13.1 | 46.5 | 3.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 51.8 | 63.3 | 7.9 | 55.3 | 58.1 | 0.4 | 43.4 | 25.9 | 3.3 | 13.1 | 46.5 | 3.8 |
| Queue Length 50th (ft) | 93 | 233 | 13 | 107 | 235 | 0 | 73 | 283 | 0 | 5 | 514 | 0 |
| Queue Length 95th (ft) | #151 | 326 | 60 | #159 | 327 | 0 | #243 | 532 | 50 | 17 | #756 | 42 |
| Internal Link Dist (ft) | 2523 | | | 1479 | | | 2542 | | | 790 | | |
| Turn Bay Length (ft) | 220 | | 330 | 300 | | | 485 | | 360 | 200 | | 325 |
| Base Capacity (vph) | 228 | 456 | 625 | 245 | 487 | 500 | 234 | 947 | 929 | 379 | 812 | 789 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.74 | 0.69 | 0.25 | 0.78 | 0.66 | 0.07 | 0.74 | 0.62 | 0.29 | 0.04 | 0.89 | 0.22 |

Intersection Summary

























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

HCM 6th Signalized Intersection Summary

11/22/2023

3: Gun Club Road & Jewell Avenue

2023 Existing (with Improvements) - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 158 | 296 | 146 | 184 | 313 | 34 | 156 | 526 | 240 | 15 | 687 | 164 |
| Future Volume (veh/h) | 158 | 296 | 146 | 184 | 313 | 34 | 156 | 526 | 240 | 15 | 687 | 164 |
| 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 | 1841 | 1841 | 1841 | 1841 | 1841 | 1841 | 1796 | 1796 | 1796 | 1885 | 1885 | 1885 |
| Adj Flow Rate, veh/h | 168 | 315 | 155 | 190 | 323 | 35 | 173 | 584 | 267 | 16 | 723 | 173 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.97 | 0.97 | 0.97 | 0.90 | 0.90 | 0.90 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 1 | 1 | 1 |
| Cap, veh/h | 235 | 358 | 394 | 246 | 389 | 329 | 254 | 943 | 799 | 278 | 906 | 768 |
| Arrive On Green | 0.08 | 0.19 | 0.19 | 0.09 | 0.21 | 0.21 | 0.06 | 0.53 | 0.53 | 0.01 | 0.48 | 0.48 |
| Sat Flow, veh/h | 1753 | 1841 | 1560 | 1753 | 1841 | 1560 | 1711 | 1796 | 1522 | 1795 | 1885 | 1598 |
| Grp Volume(v), veh/h | 168 | 315 | 155 | 190 | 323 | 35 | 173 | 584 | 267 | 16 | 723 | 173 |
| Grp Sat Flow(s),veh/h/ln | 1753 | 1841 | 1560 | 1753 | 1841 | 1560 | 1711 | 1796 | 1522 | 1795 | 1885 | 1598 |
| Q Serve(g_s), s | 9.0 | 20.0 | 9.9 | 10.4 | 20.1 | 2.2 | 6.0 | 27.5 | 12.1 | 0.5 | 38.8 | 7.6 |
| Cycle Q Clear(g_c), s | 9.0 | 20.0 | 9.9 | 10.4 | 20.1 | 2.2 | 6.0 | 27.5 | 12.1 | 0.5 | 38.8 | 7.6 |
| 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 | 235 | 358 | 394 | 246 | 389 | 329 | 254 | 943 | 799 | 278 | 906 | 768 |
| V/C Ratio(X) | 0.71 | 0.88 | 0.39 | 0.77 | 0.83 | 0.11 | 0.68 | 0.62 | 0.33 | 0.06 | 0.80 | 0.23 |
| Avail Cap(c_a), veh/h | 235 | 460 | 481 | 246 | 491 | 416 | 254 | 943 | 799 | 358 | 906 | 768 |
| 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) | 0.88 | 0.88 | 0.88 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.6 | 47.0 | 37.2 | 36.3 | 45.3 | 38.2 | 23.0 | 20.1 | 16.4 | 17.6 | 26.3 | 18.2 |
| Incr Delay (d2), s/veh | 7.6 | 13.2 | 0.6 | 12.7 | 9.4 | 0.1 | 7.3 | 3.0 | 1.1 | 0.1 | 7.3 | 0.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.3 | 10.2 | 3.7 | 5.2 | 9.9 | 0.8 | 2.6 | 11.0 | 4.2 | 0.2 | 17.4 | 2.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 45.1 | 60.1 | 37.7 | 49.0 | 54.7 | 38.3 | 30.2 | 23.1 | 17.5 | 17.7 | 33.5 | 18.8 |
| LnGrp LOS | D | E | D | D | D | D | C | C | B | B | C | B |
| Approach Vol, veh/h | 638 | | | 548 | | | 1024 | | | 912 | | |
| Approach Delay, s/veh | 50.7 | | | 51.7 | | | 22.9 | | | 30.5 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 6.7 | 69.0 | 16.0 | 28.3 | 12.0 | 63.7 | 14.0 | 30.3 | | | | |
| 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 | 7.0 | 51.0 | 11.0 | 30.0 | 7.0 | 51.0 | 9.0 | 32.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.5 | 29.5 | 12.4 | 22.0 | 8.0 | 40.8 | 11.0 | 22.1 | | | | |
| Green Ext Time (p_c), s | 0.0 | 10.7 | 0.0 | 1.4 | 0.0 | 6.8 | 0.0 | 1.3 | | | | |

Intersection Summary

| | |
|--------------------|------|
| HCM 6th Ctrl Delay | 35.8 |
| HCM 6th LOS | D |

Notes

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

Intersection Capacity Worksheets: 2027 Background

| | → | ↘ | ↙ | ← | ↓ | ↗ |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Configurations | ↑ | ↗ | ↙ | ↑ | ↖ | ↗ |
| Traffic Volume (vph) | 665 | 180 | 135 | 805 | 1 | 190 |
| Future Volume (vph) | 665 | 180 | 135 | 805 | 1 | 190 |
| Turn Type | NA | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 3 | 8 | 6 | |
| Permitted Phases | | 4 | 8 | | | 6 |
| Detector Phase | 4 | 4 | 3 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.0 | 25.0 | 10.0 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 50.0 | 50.0 | 13.0 | 63.0 | 27.0 | 27.0 |
| Total Split (%) | 55.6% | 55.6% | 14.4% | 70.0% | 30.0% | 30.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Max | C-Max | None | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90

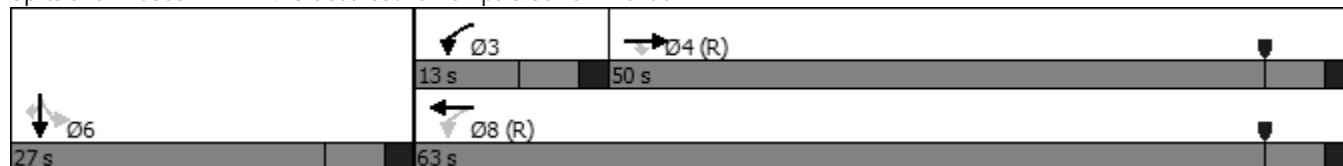
Actuated Cycle Length: 90







Offset: 68 (76%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 1: E-470 Southbound Ramps & Jewell Avenue















| |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Group Flow (vph) | 700 | 189 | 152 | 904 | 168 | 218 |
| v/c Ratio | 0.77 | 0.22 | 0.49 | 0.76 | 0.47 | 0.48 |
| Control Delay | 26.2 | 2.7 | 11.2 | 7.9 | 34.6 | 12.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 |
| Total Delay | 26.2 | 2.7 | 11.2 | 8.4 | 34.6 | 12.5 |
| Queue Length 50th (ft) | 314 | 0 | 21 | 125 | 82 | 23 |
| Queue Length 95th (ft) | 466 | 33 | m26 | m141 | 139 | 81 |
| Internal Link Dist (ft) | 679 | | | 530 | 532 | |
| Turn Bay Length (ft) | | 300 | 250 | | | |
| Base Capacity (vph) | 904 | 865 | 312 | 1191 | 361 | 450 |
| Starvation Cap Reductn | 0 | 0 | 0 | 61 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.77 | 0.22 | 0.49 | 0.80 | 0.47 | 0.48 |
| Intersection Summary | | | | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | | | | |













HCM 6th Signalized Intersection Summary

1: E-470 Southbound Ramps & Jewell Avenue

11/22/2023

2027 Background - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↑ | ↗ | ↖ | ↑ | | | | | | ↖ | ↗ |
| Traffic Volume (veh/h) | 0 | 665 | 180 | 135 | 805 | 0 | 0 | 0 | 0 | 145 | 1 | 190 |
| Future Volume (veh/h) | 0 | 665 | 180 | 135 | 805 | 0 | 0 | 0 | 0 | 145 | 1 | 190 |
| Initial Q (Qb), veh | 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 |
| Parking Bus, Adj | 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 | |
| Adj Sat Flow, veh/h/ln | 0 | 1856 | 1856 | 1885 | 1885 | 0 | | | | 1648 | 1841 | 1648 |
| Adj Flow Rate, veh/h | 0 | 700 | 189 | 152 | 904 | 0 | | | | 167 | 1 | 218 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.89 | 0.89 | 0.89 | | | | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 1 | 1 | 0 | | | | 17 | 4 | 17 |
| Cap, veh/h | 0 | 939 | 796 | 319 | 1194 | 0 | | | | 407 | 2 | 326 |
| Arrive On Green | 0.00 | 0.51 | 0.51 | 0.12 | 1.00 | 0.00 | | | | 0.23 | 0.23 | 0.23 |
| Sat Flow, veh/h | 0 | 1856 | 1572 | 1795 | 1885 | 0 | | | | 1743 | 10 | 1397 |
| Grp Volume(v), veh/h | 0 | 700 | 189 | 152 | 904 | 0 | | | | 168 | 0 | 218 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1856 | 1572 | 1795 | 1885 | 0 | | | | 1754 | 0 | 1397 |
| Q Serve(g_s), s | 0.0 | 26.9 | 6.1 | 3.5 | 0.0 | 0.0 | | | | 7.3 | 0.0 | 12.8 |
| Cycle Q Clear(g_c), s | 0.0 | 26.9 | 6.1 | 3.5 | 0.0 | 0.0 | | | | 7.3 | 0.0 | 12.8 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 0.00 | | | | 0.99 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 939 | 796 | 319 | 1194 | 0 | | | | 409 | 0 | 326 |
| V/C Ratio(X) | 0.00 | 0.75 | 0.24 | 0.48 | 0.76 | 0.00 | | | | 0.41 | 0.00 | 0.67 |
| Avail Cap(c_a), veh/h | 0 | 939 | 796 | 350 | 1194 | 0 | | | | 409 | 0 | 326 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.18 | 0.18 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 17.6 | 12.5 | 13.4 | 0.0 | 0.0 | | | | 29.3 | 0.0 | 31.3 |
| Incr Delay (d2), s/veh | 0.0 | 5.4 | 0.7 | 0.2 | 0.8 | 0.0 | | | | 3.0 | 0.0 | 10.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 11.3 | 2.0 | 1.0 | 0.3 | 0.0 | | | | 3.4 | 0.0 | 5.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 23.0 | 13.2 | 13.6 | 0.8 | 0.0 | | | | 32.3 | 0.0 | 41.8 |
| LnGrp LOS | A | C | B | B | A | A | | | | C | A | D |
| Approach Vol, veh/h | | 889 | | | 1056 | | | | | | 386 | |
| Approach Delay, s/veh | | 20.9 | | | 2.7 | | | | | | 37.6 | |
| Approach LOS | | C | | | A | | | | | | D | |
| Timer - Assigned Phs | | | 3 | 4 | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | | | 11.5 | 51.5 | | 27.0 | | 63.0 | | | | |
| Change Period (Y+Rc), s | | | 6.0 | 6.0 | | 6.0 | | 6.0 | | | | |
| Max Green Setting (Gmax), s | | | 7.0 | 44.0 | | 21.0 | | 57.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | | 5.5 | 28.9 | | 14.8 | | 2.0 | | | | |
| Green Ext Time (p_c), s | | | 0.1 | 4.5 | | 0.9 | | 7.9 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 15.4 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

| |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
| Lane Configurations |  |  |  |  |  |  |
| Traffic Volume (vph) | 225 | 585 | 745 | 70 | 0 | 125 |
| Future Volume (vph) | 225 | 585 | 745 | 70 | 0 | 125 |
| Turn Type | pm+pt | NA | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 8 | | 2 | |
| Permitted Phases | 4 | | | 8 | | 2 |
| Detector Phase | 7 | 4 | 8 | 8 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 3.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.5 | 25.0 | 25.0 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 15.0 | 64.0 | 49.0 | 49.0 | 26.0 | 26.0 |
| Total Split (%) | 16.7% | 71.1% | 54.4% | 54.4% | 28.9% | 28.9% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Recall Mode | None | C-Max | C-Max | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90





Actuated Cycle Length: 90

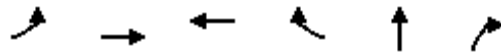
Offset: 60 (67%), Referenced to phase 4:EBTL and 8:WBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 2: E-470 Northbound Ramps & Jewell Avenue

| | | |
|--|--|--|
|  Ø2 |  Ø4 (R) | |
| 26 s | 64 s | |
| |  Ø7 |  Ø8 (R) |
| | 15 s | 49 s |



| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
|-------------------------|-------|------|------|------|------|------|
| Lane Group Flow (vph) | 237 | 616 | 847 | 80 | 224 | 144 |
| v/c Ratio | 0.94 | 0.53 | 0.96 | 0.10 | 0.58 | 0.31 |
| Control Delay | 65.8 | 10.0 | 46.6 | 1.7 | 38.0 | 7.3 |
| Queue Delay | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 65.8 | 10.2 | 46.6 | 1.7 | 38.0 | 7.3 |
| Queue Length 50th (ft) | 118 | 135 | 446 | 0 | 114 | 0 |
| Queue Length 95th (ft) | m#184 | 250 | #683 | 13 | 181 | 42 |
| Internal Link Dist (ft) | | 530 | 2523 | | 717 | |
| Turn Bay Length (ft) | 250 | | | 250 | | 175 |
| Base Capacity (vph) | 252 | 1166 | 881 | 806 | 389 | 460 |
| Starvation Cap Reductn | 0 | 88 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.94 | 0.57 | 0.96 | 0.10 | 0.58 | 0.31 |

Intersection Summary

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

Queue shown is maximum after two cycles.



















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

























HCM 6th Signalized Intersection Summary

11/22/2023

2: E-470 Northbound Ramps & Jewell Avenue

2027 Background - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|--|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | | |  |  | |  |  | | | |
| Traffic Volume (veh/h) | 225 | 585 | 0 | 0 | 745 | 70 | 195 | 0 | 125 | 0 | 0 | 0 |
| Future Volume (veh/h) | 225 | 585 | 0 | 0 | 745 | 70 | 195 | 0 | 125 | 0 | 0 | 0 |
| Initial Q (Qb), veh | 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 | | | |
| Parking Bus, Adj | 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 | | | | | |
| Adj Sat Flow, veh/h/ln | 1826 | 1826 | 0 | 0 | 1856 | 1856 | 1856 | 1856 | 1856 | | | |
| Adj Flow Rate, veh/h | 237 | 616 | 0 | 0 | 847 | 80 | 224 | 0 | 144 | | | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.88 | 0.88 | 0.88 | 0.87 | 0.87 | 0.87 | | | |
| Percent Heavy Veh, % | 5 | 5 | 0 | 0 | 3 | 3 | 3 | 3 | 3 | | | |
| Cap, veh/h | 271 | 1177 | 0 | 0 | 905 | 767 | 393 | 0 | 349 | | | |
| Arrive On Green | 0.18 | 1.00 | 0.00 | 0.00 | 0.49 | 0.49 | 0.22 | 0.00 | 0.22 | | | |
| Sat Flow, veh/h | 1739 | 1826 | 0 | 0 | 1856 | 1572 | 1767 | 0 | 1572 | | | |
| Grp Volume(v), veh/h | 237 | 616 | 0 | 0 | 847 | 80 | 224 | 0 | 144 | | | |
| Grp Sat Flow(s),veh/h/ln | 1739 | 1826 | 0 | 0 | 1856 | 1572 | 1767 | 0 | 1572 | | | |
| Q Serve(g_s), s | 6.1 | 0.0 | 0.0 | 0.0 | 38.7 | 2.5 | 10.2 | 0.0 | 7.1 | | | |
| Cycle Q Clear(g_c), s | 6.1 | 0.0 | 0.0 | 0.0 | 38.7 | 2.5 | 10.2 | 0.0 | 7.1 | | | |
| Prop In Lane | 1.00 | | 0.00 | 0.00 | | 1.00 | 1.00 | | 1.00 | | | |
| Lane Grp Cap(c), veh/h | 271 | 1177 | 0 | 0 | 905 | 767 | 393 | 0 | 349 | | | |
| V/C Ratio(X) | 0.88 | 0.52 | 0.00 | 0.00 | 0.94 | 0.10 | 0.57 | 0.00 | 0.41 | | | |
| Avail Cap(c_a), veh/h | 288 | 1177 | 0 | 0 | 905 | 767 | 393 | 0 | 349 | | | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | |
| Upstream Filter(I) | 0.54 | 0.54 | 0.00 | 0.00 | 0.62 | 0.62 | 1.00 | 0.00 | 1.00 | | | |
| Uniform Delay (d), s/veh | 17.7 | 0.0 | 0.0 | 0.0 | 21.7 | 12.5 | 31.2 | 0.0 | 30.0 | | | |
| Incr Delay (d2), s/veh | 14.6 | 0.9 | 0.0 | 0.0 | 12.6 | 0.2 | 5.9 | 0.0 | 3.6 | | | |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | |
| %ile BackOfQ(50%),veh/ln | 3.1 | 0.3 | 0.0 | 0.0 | 17.6 | 0.8 | 4.9 | 0.0 | 3.0 | | | |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 32.3 | 0.9 | 0.0 | 0.0 | 34.3 | 12.6 | 37.1 | 0.0 | 33.5 | | | |
| LnGrp LOS | C | A | A | A | C | B | D | A | C | | | |
| Approach Vol, veh/h | 853 | | | 927 | | | 368 | | | | | |
| Approach Delay, s/veh | 9.6 | | | 32.5 | | | 35.7 | | | | | |
| Approach LOS | A | | | C | | | D | | | | | |
| Timer - Assigned Phs | 2 | | | 4 | | | 7 | | | 8 | | |
| Phs Duration (G+Y+Rc), s | 26.0 | | | 64.0 | | | 14.1 | | | 49.9 | | |
| Change Period (Y+Rc), s | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | | |
| Max Green Setting (Gmax), s | 20.0 | | | 58.0 | | | 9.0 | | | 43.0 | | |
| Max Q Clear Time (g_c+I1), s | 12.2 | | | 2.0 | | | 8.1 | | | 40.7 | | |
| Green Ext Time (p_c), s | 1.1 | | | 4.2 | | | 0.1 | | | 1.3 | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | 23.9 | | | | | | | | | | | |
| HCM 6th LOS | C | | | | | | | | | | | |
| Notes | | | | | | | | | | | | |
| User approved pedestrian interval to be less than phase max green. | | | | | | | | | | | | |

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 150 | 245 | 315 | 300 | 385 | 45 | 260 | 655 | 105 | 40 | 560 | 170 |
| Future Volume (vph) | 150 | 245 | 315 | 300 | 385 | 45 | 260 | 655 | 105 | 40 | 560 | 170 |
| Turn Type | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 5 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 5 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 4.0 | 4.0 | 3.0 | 5.0 | 5.0 | 4.0 | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 |
| Minimum Split (s) | 8.0 | 32.0 | 9.0 | 8.0 | 32.0 | 32.0 | 9.0 | 40.0 | 40.0 | 9.0 | 29.0 | 29.0 |
| Total Split (s) | 12.0 | 32.0 | 24.0 | 25.0 | 45.0 | 45.0 | 24.0 | 54.0 | 54.0 | 9.0 | 39.0 | 39.0 |
| Total Split (%) | 10.0% | 26.7% | 20.0% | 20.8% | 37.5% | 37.5% | 20.0% | 45.0% | 45.0% | 7.5% | 32.5% | 32.5% |
| Yellow Time (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120









Actuated Cycle Length: 120













Offset: 108.5 (90%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 3: Gun Club Road & Jewell Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 9 s | 54 s | 25 s | 32 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 24 s | 39 s | 12 s | 45 s |

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 158 | 258 | 332 | 345 | 443 | 52 | 400 | 1008 | 162 | 46 | 644 | 195 |
| v/c Ratio | 0.85 | 0.68 | 0.48 | 0.82 | 0.86 | 0.09 | 0.78 | 0.62 | 0.20 | 0.20 | 0.55 | 0.30 |
| Control Delay | 92.0 | 53.0 | 18.3 | 66.9 | 57.0 | 0.3 | 54.3 | 40.5 | 14.5 | 19.1 | 35.9 | 5.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 92.0 | 53.0 | 18.3 | 66.9 | 57.0 | 0.3 | 54.3 | 40.5 | 14.5 | 19.1 | 35.9 | 5.5 |
| Queue Length 50th (ft) | 63 | 184 | 115 | 136 | 324 | 0 | 154 | 408 | 27 | 16 | 216 | 0 |
| Queue Length 95th (ft) | #122 | 273 | 194 | 173 | 402 | 0 | 148 | 336 | 47 | 38 | 287 | 47 |
| Internal Link Dist (ft) | 2523 | | | 1479 | | | 2465 | | | 790 | | |
| Turn Bay Length (ft) | 220 | | 330 | 300 | | | 485 | | 360 | 200 | | 325 |
| Base Capacity (vph) | 192 | 410 | 700 | 572 | 621 | 637 | 554 | 1629 | 816 | 227 | 1180 | 660 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.82 | 0.63 | 0.47 | 0.60 | 0.71 | 0.08 | 0.72 | 0.62 | 0.20 | 0.20 | 0.55 | 0.30 |

Intersection Summary

























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

HCM 6th Signalized Intersection Summary

11/22/2023

3: Gun Club Road & Jewell Avenue

2027 Background - AM Peak Hour























| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 150 | 245 | 315 | 300 | 385 | 45 | 260 | 655 | 105 | 40 | 560 | 170 |
| Future Volume (veh/h) | 150 | 245 | 315 | 300 | 385 | 45 | 260 | 655 | 105 | 40 | 560 | 170 |
| 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 | 1811 | 1811 | 1811 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1841 | 1841 | 1841 |
| Adj Flow Rate, veh/h | 158 | 258 | 332 | 345 | 443 | 52 | 400 | 1008 | 162 | 46 | 644 | 195 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.87 | 0.87 | 0.87 | 0.65 | 0.65 | 0.65 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 6 | 6 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 |
| Cap, veh/h | 195 | 373 | 522 | 398 | 491 | 416 | 463 | 1698 | 758 | 234 | 1294 | 577 |
| Arrive On Green | 0.06 | 0.21 | 0.21 | 0.12 | 0.26 | 0.26 | 0.13 | 0.48 | 0.48 | 0.03 | 0.37 | 0.37 |
| Sat Flow, veh/h | 3346 | 1811 | 1535 | 3456 | 1870 | 1585 | 3456 | 3554 | 1585 | 1753 | 3497 | 1560 |
| Grp Volume(v), veh/h | 158 | 258 | 332 | 345 | 443 | 52 | 400 | 1008 | 162 | 46 | 644 | 195 |
| Grp Sat Flow(s),veh/h/ln | 1673 | 1811 | 1535 | 1728 | 1870 | 1585 | 1728 | 1777 | 1585 | 1753 | 1749 | 1560 |
| Q Serve(g_s), s | 5.6 | 15.8 | 21.9 | 11.8 | 27.5 | 3.0 | 13.6 | 24.8 | 7.1 | 2.0 | 17.1 | 10.8 |
| Cycle Q Clear(g_c), s | 5.6 | 15.8 | 21.9 | 11.8 | 27.5 | 3.0 | 13.6 | 24.8 | 7.1 | 2.0 | 17.1 | 10.8 |
| 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 | 195 | 373 | 522 | 398 | 491 | 416 | 463 | 1698 | 758 | 234 | 1294 | 577 |
| V/C Ratio(X) | 0.81 | 0.69 | 0.64 | 0.87 | 0.90 | 0.12 | 0.86 | 0.59 | 0.21 | 0.20 | 0.50 | 0.34 |
| Avail Cap(c_a), veh/h | 195 | 407 | 551 | 576 | 623 | 528 | 547 | 1698 | 758 | 246 | 1294 | 577 |
| 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) | 0.87 | 0.87 | 0.87 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.8 | 44.1 | 33.4 | 52.2 | 42.7 | 33.7 | 50.9 | 22.8 | 18.2 | 23.1 | 29.2 | 27.2 |
| Incr Delay (d2), s/veh | 18.2 | 3.9 | 2.0 | 7.0 | 14.0 | 0.1 | 11.9 | 1.5 | 0.6 | 0.4 | 1.4 | 1.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.8 | 7.3 | 8.1 | 5.4 | 14.1 | 1.1 | 6.4 | 9.8 | 2.6 | 0.8 | 7.0 | 4.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 74.1 | 48.0 | 35.3 | 59.1 | 56.7 | 33.9 | 62.8 | 24.4 | 18.9 | 23.5 | 30.6 | 28.8 |
| LnGrp LOS | E | D | D | E | E | C | E | C | B | C | C | C |
| Approach Vol, veh/h | 748 | | | 840 | | | 1570 | | | 885 | | |
| Approach Delay, s/veh | 47.9 | | | 56.3 | | | 33.6 | | | 29.8 | | |
| Approach LOS | D | | | E | | | C | | | C | | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 8.1 | 63.3 | 18.8 | 29.7 | 21.1 | 50.4 | 12.0 | 36.5 | | | | |
| 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 | 4.0 | 48.0 | 20.0 | 27.0 | 19.0 | 33.0 | 7.0 | 40.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 4.0 | 26.8 | 13.8 | 23.9 | 15.6 | 19.1 | 7.6 | 29.5 | | | | |
| Green Ext Time (p_c), s | 0.0 | 14.4 | 0.0 | 0.8 | 0.5 | 7.8 | 0.0 | 1.9 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | 40.1 | | | | | | | | | | | |
| HCM 6th LOS | D | | | | | | | | | | | |
| Notes | | | | | | | | | | | | |

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0.3 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | ↗ | ↘ | ↗↘ | ↗↘ | ↗ |
| Traffic Vol, veh/h | 0 | 5 | 50 | 1020 | 1060 | 100 |
| Future Vol, veh/h | 0 | 5 | 50 | 1020 | 1060 | 100 |
| 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 | 200 | - | - | 200 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 95 | 95 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 5 | 54 | 1074 | 1116 | 109 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - | 558 | 1225 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | - | 6.94 | 4.14 |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | - | 3.32 | 2.22 |
| Pot Cap-1 Maneuver | 0 | 473 | 565 |
| Stage 1 | 0 | - | - |
| Stage 2 | 0 | - | - |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | - | 473 | 565 |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |

| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 12.7 | 0.6 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h) | 565 | - | 473 | - | - |
| HCM Lane V/C Ratio | 0.096 | - | 0.011 | - | - |
| HCM Control Delay (s) | 12 | - | 12.7 | - | - |
| HCM Lane LOS | B | - | B | - | - |
| HCM 95th %tile Q(veh) | 0.3 | - | 0 | - | - |

| |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 50 | 5 | 55 | 5 | 45 | 100 | 975 | 30 | 75 | 865 | 125 |
| Future Volume (vph) | 50 | 5 | 55 | 5 | 45 | 100 | 975 | 30 | 75 | 865 | 125 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 8 | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 33.0 | 11.0 | 33.0 | 33.0 | 11.0 | 30.0 | 30.0 | 11.0 | 30.0 | 30.0 |
| Total Split (s) | 20.0 | 42.0 | 20.0 | 42.0 | 42.0 | 20.0 | 38.0 | 38.0 | 20.0 | 38.0 | 38.0 |
| Total Split (%) | 16.7% | 35.0% | 16.7% | 35.0% | 35.0% | 16.7% | 31.7% | 31.7% | 16.7% | 31.7% | 31.7% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120









Actuated Cycle Length: 120












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

Natural Cycle: 85

Control Type: Actuated-Coordinated

Splits and Phases: 102: Gun Club Road & Yale Avenue
























| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 20 s | 38 s | 20 s | 42 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 20 s | 38 s | 20 s | 42 s |

| |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 54 | 16 | 60 | 5 | 49 | 109 | 1026 | 33 | 82 | 911 | 136 |
| v/c Ratio | 0.30 | 0.13 | 0.25 | 0.04 | 0.21 | 0.26 | 0.44 | 0.03 | 0.21 | 0.40 | 0.13 |
| Control Delay | 48.4 | 34.0 | 42.9 | 52.8 | 2.0 | 7.2 | 13.7 | 0.1 | 5.8 | 16.3 | 6.1 |
| 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 | 48.4 | 34.0 | 42.9 | 52.8 | 2.0 | 7.2 | 13.7 | 0.1 | 5.8 | 16.3 | 6.1 |
| Queue Length 50th (ft) | 41 | 4 | 39 | 4 | 0 | 24 | 223 | 0 | 26 | 218 | 23 |
| Queue Length 95th (ft) | 70 | 27 | 77 | 17 | 0 | 45 | 318 | 0 | m33 | 377 | 59 |
| Internal Link Dist (ft) | | 816 | | 718 | | | 2631 | | | 1641 | |
| Turn Bay Length (ft) | 150 | | 350 | | 10 | 300 | | 300 | 300 | | 300 |
| Base Capacity (vph) | 256 | 509 | 279 | 558 | 570 | 509 | 2358 | 1100 | 474 | 2254 | 1057 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.21 | 0.03 | 0.22 | 0.01 | 0.09 | 0.21 | 0.44 | 0.03 | 0.17 | 0.40 | 0.13 |
| Intersection Summary | | | | | | | | | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | | | | | | | | | |

HCM 6th Signalized Intersection Summary

11/22/2023

102: Gun Club Road & Yale Avenue
2027 Background - AM Peak Hour









| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 50 | 5 | 10 | 55 | 5 | 45 | 100 | 975 | 30 | 75 | 865 | 125 |
| Future Volume (veh/h) | 50 | 5 | 10 | 55 | 5 | 45 | 100 | 975 | 30 | 75 | 865 | 125 |
| 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 | 54 | 5 | 11 | 60 | 5 | 0 | 109 | 1026 | 33 | 82 | 911 | 136 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.95 | 0.92 | 0.92 | 0.95 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 214 | 32 | 70 | 207 | 122 | | 422 | 2338 | 1043 | 406 | 2333 | 1040 |
| Arrive On Green | 0.04 | 0.06 | 0.06 | 0.04 | 0.07 | 0.00 | 0.04 | 0.66 | 0.66 | 0.04 | 0.66 | 0.66 |
| Sat Flow, veh/h | 1781 | 520 | 1144 | 1781 | 1870 | 1585 | 1781 | 3554 | 1585 | 1781 | 3554 | 1585 |
| Grp Volume(v), veh/h | 54 | 0 | 16 | 60 | 5 | 0 | 109 | 1026 | 33 | 82 | 911 | 136 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1664 | 1781 | 1870 | 1585 | 1781 | 1777 | 1585 | 1781 | 1777 | 1585 |
| Q Serve(g_s), s | 3.4 | 0.0 | 1.1 | 3.8 | 0.3 | 0.0 | 2.4 | 16.7 | 0.9 | 1.8 | 14.2 | 3.9 |
| Cycle Q Clear(g_c), s | 3.4 | 0.0 | 1.1 | 3.8 | 0.3 | 0.0 | 2.4 | 16.7 | 0.9 | 1.8 | 14.2 | 3.9 |
| Prop In Lane | 1.00 | | 0.69 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 214 | 0 | 102 | 207 | 122 | | 422 | 2338 | 1043 | 406 | 2333 | 1040 |
| V/C Ratio(X) | 0.25 | 0.00 | 0.16 | 0.29 | 0.04 | | 0.26 | 0.44 | 0.03 | 0.20 | 0.39 | 0.13 |
| Avail Cap(c_a), veh/h | 354 | 0 | 499 | 341 | 561 | | 558 | 2338 | 1043 | 544 | 2333 | 1040 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 50.2 | 0.0 | 53.4 | 50.0 | 52.6 | 0.0 | 6.9 | 9.9 | 7.2 | 7.2 | 9.5 | 7.7 |
| Incr Delay (d2), s/veh | 0.6 | 0.0 | 0.7 | 0.8 | 0.1 | 0.0 | 0.3 | 0.6 | 0.1 | 0.2 | 0.5 | 0.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.5 | 0.0 | 0.5 | 1.7 | 0.1 | 0.0 | 0.7 | 5.5 | 0.3 | 0.6 | 4.7 | 1.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 50.8 | 0.0 | 54.1 | 50.7 | 52.7 | 0.0 | 7.2 | 10.5 | 7.2 | 7.4 | 10.0 | 8.0 |
| LnGrp LOS | D | A | D | D | D | | A | B | A | A | B | A |
| Approach Vol, veh/h | | 70 | | | 65 | | | 1168 | | | 1129 | |
| Approach Delay, s/veh | | 51.6 | | | 50.9 | | | 10.1 | | | 9.6 | |
| Approach LOS | | D | | | D | | | B | | | A | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 10.7 | 85.0 | 11.0 | 13.3 | 10.9 | 84.8 | 10.5 | 13.8 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 14.0 | 32.0 | 14.0 | 36.0 | 14.0 | 32.0 | 14.0 | 36.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.8 | 18.7 | 5.8 | 3.1 | 4.4 | 16.2 | 5.4 | 2.3 | | | | |
| Green Ext Time (p_c), s | 0.1 | 5.3 | 0.1 | 0.0 | 0.1 | 5.4 | 0.1 | 0.0 | | | | |

Intersection Summary

HCM 6th Ctrl Delay 12.1
HCM 6th LOS B

Notes

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

| Intersection | | | | | | |
|----------------------------|---|---|---|---|---|---|
| Int Delay, s/veh | 0.2 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations |  |  |   |  |  |   |
| Traffic Vol, veh/h | 5 | 15 | 1005 | 15 | 20 | 1155 |
| Future Vol, veh/h | 5 | 15 | 1005 | 15 | 20 | 1155 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 350 | 0 | - | 350 | 350 | - |
| 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 | 5 | 16 | 1092 | 16 | 22 | 1255 |
| | | | | | | |
| Major/Minor | Minor1 | Major1 | | Major2 | | |
| Conflicting Flow All | 1764 | 546 | 0 | 0 | 1108 | 0 |
| Stage 1 | 1092 | - | - | - | - | - |
| Stage 2 | 672 | - | - | - | - | - |
| Critical Hdwy | 6.84 | 6.94 | - | - | 4.14 | - |
| Critical Hdwy Stg 1 | 5.84 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.84 | - | - | - | - | - |
| Follow-up Hdwy | 3.52 | 3.32 | - | - | 2.22 | - |
| Pot Cap-1 Maneuver | *270 | *674 | - | - | *1009 | - |
| Stage 1 | *636 | - | - | - | - | - |
| Stage 2 | *589 | - | - | - | - | - |
| Platoon blocked, % | 1 | 1 | - | - | 1 | - |
| Mov Cap-1 Maneuver | *264 | *674 | - | - | *1009 | - |
| Mov Cap-2 Maneuver | *264 | - | - | - | - | - |
| Stage 1 | *636 | - | - | - | - | - |
| Stage 2 | *576 | - | - | - | - | - |
| | | | | | | |
| | | | | | | |
| Approach | WB | NB | | SB | | |
| HCM Control Delay, s | 12.6 | 0 | | 0.1 | | |
| HCM LOS | B | | | | | |
| | | | | | | |
| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | WBLn2 | SBL | SBT |
| Capacity (veh/h) | - | - | 264 | 674 | *1009 | - |
| HCM Lane V/C Ratio | - | - | 0.021 | 0.024 | 0.022 | - |
| HCM Control Delay (s) | - | - | 18.9 | 10.5 | 8.6 | - |
| HCM Lane LOS | - | - | C | B | A | - |
| HCM 95th %tile Q(veh) | - | - | 0.1 | 0.1 | 0.1 | - |
| Notes | | | | | | |
| ~: Volume exceeds capacity | | \$: Delay exceeds 300s | | +: Computation Not Defined | | *: All major volume in platoon |

| | → | ↘ | ↙ | ← | ↓ | ↗ |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Configurations | ↑ | ↗ | ↙ | ↑ | ↖ | ↗ |
| Traffic Volume (vph) | 790 | 320 | 170 | 700 | 5 | 260 |
| Future Volume (vph) | 790 | 320 | 170 | 700 | 5 | 260 |
| Turn Type | NA | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 3 | 8 | 6 | |
| Permitted Phases | | 4 | 8 | | | 6 |
| Detector Phase | 4 | 4 | 3 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.0 | 25.0 | 12.5 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 50.5 | 50.5 | 12.5 | 63.0 | 27.0 | 27.0 |
| Total Split (%) | 56.1% | 56.1% | 13.9% | 70.0% | 30.0% | 30.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Max | C-Max | None | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90

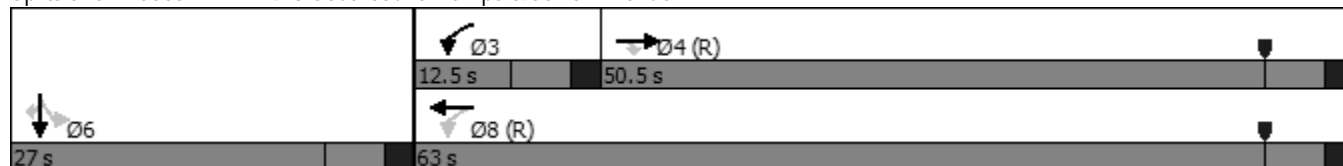
Actuated Cycle Length: 90







Offset: 83 (92%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 1: E-470 Southbound Ramps & Jewell Avenue















| |  |  |  |  |  |  |
|-----------------------------|---|---|---|---|---|---|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Group Flow (vph) | 832 | 337 | 177 | 729 | 70 | 302 |
| v/c Ratio | 0.90 | 0.35 | 0.84 | 0.62 | 0.18 | 0.56 |
| Control Delay | 36.1 | 2.6 | 43.3 | 13.0 | 29.1 | 11.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |
| Total Delay | 36.1 | 2.6 | 43.3 | 13.3 | 29.1 | 11.6 |
| Queue Length 50th (ft) | 413 | 0 | 82 | 219 | 32 | 27 |
| Queue Length 95th (ft) | #667 | 41 | m92 | m226 | 64 | 90 |
| Internal Link Dist (ft) | 679 | | | 530 | 532 | |
| Turn Bay Length (ft) | | 300 | 250 | | | |
| Base Capacity (vph) | 921 | 953 | 211 | 1179 | 399 | 541 |
| Starvation Cap Reductn | 0 | 0 | 0 | 98 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.90 | 0.35 | 0.84 | 0.67 | 0.18 | 0.56 |
| Intersection Summary | | | | | | |
| # | 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. | | | | | |
| m | Volume for 95th percentile queue is metered by upstream signal. | | | | | |













HCM 6th Signalized Intersection Summary

1: E-470 Southbound Ramps & Jewell Avenue

11/22/2023

2027 Background - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↑ | ↗ | ↖ | ↑ | | | | | | ↖ | ↗ |
| Traffic Volume (veh/h) | 0 | 790 | 320 | 170 | 700 | 0 | 0 | 0 | 0 | 55 | 5 | 260 |
| Future Volume (veh/h) | 0 | 790 | 320 | 170 | 700 | 0 | 0 | 0 | 0 | 55 | 5 | 260 |
| Initial Q (Qb), veh | 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 |
| Parking Bus, Adj | 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 | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 1870 | 1870 | 0 | | | | 1811 | 1811 | 1811 |
| Adj Flow Rate, veh/h | 0 | 832 | 337 | 177 | 729 | 0 | | | | 64 | 6 | 302 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.96 | 0.96 | 0.96 | | | | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 0 | | | | 6 | 6 | 6 |
| Cap, veh/h | 0 | 931 | 789 | 248 | 1185 | 0 | | | | 369 | 35 | 358 |
| Arrive On Green | 0.00 | 0.50 | 0.50 | 0.14 | 1.00 | 0.00 | | | | 0.23 | 0.23 | 0.23 |
| Sat Flow, veh/h | 0 | 1870 | 1585 | 1781 | 1870 | 0 | | | | 1583 | 148 | 1535 |
| Grp Volume(v), veh/h | 0 | 832 | 337 | 177 | 729 | 0 | | | | 70 | 0 | 302 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1870 | 1585 | 1781 | 1870 | 0 | | | | 1732 | 0 | 1535 |
| Q Serve(g_s), s | 0.0 | 36.2 | 12.2 | 4.2 | 0.0 | 0.0 | | | | 2.9 | 0.0 | 16.9 |
| Cycle Q Clear(g_c), s | 0.0 | 36.2 | 12.2 | 4.2 | 0.0 | 0.0 | | | | 2.9 | 0.0 | 16.9 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 0.00 | | | | 0.91 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 931 | 789 | 248 | 1185 | 0 | | | | 404 | 0 | 358 |
| V/C Ratio(X) | 0.00 | 0.89 | 0.43 | 0.71 | 0.62 | 0.00 | | | | 0.17 | 0.00 | 0.84 |
| Avail Cap(c_a), veh/h | 0 | 931 | 789 | 255 | 1185 | 0 | | | | 404 | 0 | 358 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.09 | 0.09 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 20.4 | 14.4 | 18.0 | 0.0 | 0.0 | | | | 27.6 | 0.0 | 32.9 |
| Incr Delay (d2), s/veh | 0.0 | 12.8 | 1.7 | 0.8 | 0.2 | 0.0 | | | | 0.9 | 0.0 | 20.9 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 16.8 | 4.2 | 1.6 | 0.1 | 0.0 | | | | 1.3 | 0.0 | 8.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 33.2 | 16.1 | 18.9 | 0.2 | 0.0 | | | | 28.5 | 0.0 | 53.8 |
| LnGrp LOS | A | C | B | B | A | A | | | | C | A | D |
| Approach Vol, veh/h | | 1169 | | | 906 | | | | | | 372 | |
| Approach Delay, s/veh | | 28.3 | | | 3.9 | | | | | | 49.0 | |
| Approach LOS | | C | | | A | | | | | | D | |
| Timer - Assigned Phs | | | 3 | 4 | | 6 | | | 8 | | | |
| Phs Duration (G+Y+Rc), s | | | 12.2 | 50.8 | | 27.0 | | | 63.0 | | | |
| Change Period (Y+Rc), s | | | 6.0 | 6.0 | | 6.0 | | | 6.0 | | | |
| Max Green Setting (Gmax), s | | | 6.5 | 44.5 | | 21.0 | | | 57.0 | | | |
| Max Q Clear Time (g_c+I1), s | | | 6.2 | 38.2 | | 18.9 | | | 2.0 | | | |
| Green Ext Time (p_c), s | | | 0.0 | 3.4 | | 0.3 | | | 5.4 | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 22.4 | | | | | | | | | |
| HCM 6th LOS | | | C | | | | | | | | | |

| |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
| Lane Configurations |  |  |  |  |  |  |
| Traffic Volume (vph) | 195 | 650 | 750 | 170 | 0 | 80 |
| Future Volume (vph) | 195 | 650 | 750 | 170 | 0 | 80 |
| Turn Type | pm+pt | NA | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 8 | | 2 | |
| Permitted Phases | 4 | | | 8 | | 2 |
| Detector Phase | 7 | 4 | 8 | 8 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 3.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.5 | 25.0 | 25.0 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 15.0 | 63.0 | 48.0 | 48.0 | 27.0 | 27.0 |
| Total Split (%) | 16.7% | 70.0% | 53.3% | 53.3% | 30.0% | 30.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Recall Mode | None | C-Max | C-Max | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90





Actuated Cycle Length: 90

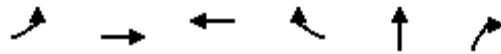
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 2: E-470 Northbound Ramps & Jewell Avenue

| | | |
|--|--|--|
|  Ø2 |  Ø4 (R) | |
| 27 s | 63 s | |
| |  Ø7 |  Ø8 (R) |
| | 15 s | 48 s |



| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
|-------------------------|------|------|------|------|------|------|
| Lane Group Flow (vph) | 210 | 699 | 833 | 189 | 150 | 100 |
| v/c Ratio | 0.83 | 0.60 | 1.00 | 0.24 | 0.37 | 0.23 |
| Control Delay | 51.6 | 3.9 | 58.1 | 3.1 | 32.2 | 6.5 |
| Queue Delay | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 51.6 | 4.1 | 58.1 | 3.1 | 32.2 | 6.5 |
| Queue Length 50th (ft) | 86 | 43 | ~463 | 1 | 72 | 0 |
| Queue Length 95th (ft) | m106 | m59 | #724 | 35 | 112 | 25 |
| Internal Link Dist (ft) | | 530 | 2523 | | 717 | |
| Turn Bay Length (ft) | 250 | | | 250 | | 175 |
| Base Capacity (vph) | 254 | 1157 | 829 | 804 | 401 | 442 |
| Starvation Cap Reductn | 0 | 64 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.83 | 0.64 | 1.00 | 0.24 | 0.37 | 0.23 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.



















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

























HCM 6th Signalized Intersection Summary

11/22/2023

2: E-470 Northbound Ramps & Jewell Avenue

2027 Background - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | | |  |  | |  |  | | | |
| Traffic Volume (veh/h) | 195 | 650 | 0 | 0 | 750 | 170 | 120 | 0 | 80 | 0 | 0 | 0 |
| Future Volume (veh/h) | 195 | 650 | 0 | 0 | 750 | 170 | 120 | 0 | 80 | 0 | 0 | 0 |
| Initial Q (Qb), veh | 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 | | | |
| Parking Bus, Adj | 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 | | | | | |
| Adj Sat Flow, veh/h/ln | 1841 | 1841 | 0 | 0 | 1796 | 1796 | 1826 | 1826 | 1826 | | | |
| Adj Flow Rate, veh/h | 210 | 699 | 0 | 0 | 833 | 189 | 150 | 0 | 100 | | | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.90 | 0.90 | 0.90 | 0.80 | 0.80 | 0.80 | | | |
| Percent Heavy Veh, % | 4 | 4 | 0 | 0 | 7 | 7 | 5 | 5 | 5 | | | |
| Cap, veh/h | 245 | 1166 | 0 | 0 | 871 | 738 | 406 | 0 | 361 | | | |
| Arrive On Green | 0.16 | 1.00 | 0.00 | 0.00 | 0.48 | 0.48 | 0.23 | 0.00 | 0.23 | | | |
| Sat Flow, veh/h | 1753 | 1841 | 0 | 0 | 1796 | 1522 | 1739 | 0 | 1547 | | | |
| Grp Volume(v), veh/h | 210 | 699 | 0 | 0 | 833 | 189 | 150 | 0 | 100 | | | |
| Grp Sat Flow(s),veh/h/ln | 1753 | 1841 | 0 | 0 | 1796 | 1522 | 1739 | 0 | 1547 | | | |
| Q Serve(g_s), s | 5.3 | 0.0 | 0.0 | 0.0 | 40.1 | 6.6 | 6.5 | 0.0 | 4.8 | | | |
| Cycle Q Clear(g_c), s | 5.3 | 0.0 | 0.0 | 0.0 | 40.1 | 6.6 | 6.5 | 0.0 | 4.8 | | | |
| Prop In Lane | 1.00 | | 0.00 | 0.00 | | 1.00 | 1.00 | | 1.00 | | | |
| Lane Grp Cap(c), veh/h | 245 | 1166 | 0 | 0 | 871 | 738 | 406 | 0 | 361 | | | |
| V/C Ratio(X) | 0.86 | 0.60 | 0.00 | 0.00 | 0.96 | 0.26 | 0.37 | 0.00 | 0.28 | | | |
| Avail Cap(c_a), veh/h | 277 | 1166 | 0 | 0 | 871 | 738 | 406 | 0 | 361 | | | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | |
| Upstream Filter(I) | 0.31 | 0.31 | 0.00 | 0.00 | 0.65 | 0.65 | 1.00 | 0.00 | 1.00 | | | |
| Uniform Delay (d), s/veh | 18.3 | 0.0 | 0.0 | 0.0 | 22.3 | 13.6 | 28.9 | 0.0 | 28.3 | | | |
| Incr Delay (d2), s/veh | 7.6 | 0.7 | 0.0 | 0.0 | 16.2 | 0.5 | 2.6 | 0.0 | 1.9 | | | |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | |
| %ile BackOfQ(50%),veh/ln | 2.3 | 0.2 | 0.0 | 0.0 | 18.4 | 2.1 | 3.0 | 0.0 | 1.9 | | | |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 25.9 | 0.7 | 0.0 | 0.0 | 38.4 | 14.2 | 31.5 | 0.0 | 30.2 | | | |
| LnGrp LOS | C | A | A | A | D | B | C | A | C | | | |
| Approach Vol, veh/h | 909 | | | 1022 | | | 250 | | | | | |
| Approach Delay, s/veh | 6.5 | | | 34.0 | | | 31.0 | | | | | |
| Approach LOS | A | | | C | | | C | | | | | |
| Timer - Assigned Phs | 2 | | | 4 | | | 7 | | | 8 | | |
| Phs Duration (G+Y+Rc), s | 27.0 | | | 63.0 | | | 13.4 | | | 49.6 | | |
| Change Period (Y+Rc), s | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | | |
| Max Green Setting (Gmax), s | 21.0 | | | 57.0 | | | 9.0 | | | 42.0 | | |
| Max Q Clear Time (g_c+I1), s | 8.5 | | | 2.0 | | | 7.3 | | | 42.1 | | |
| Green Ext Time (p_c), s | 0.9 | | | 5.1 | | | 0.1 | | | 0.0 | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | 22.2 | | | | | | | | | | | |
| HCM 6th LOS | C | | | | | | | | | | | |

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 180 | 335 | 215 | 235 | 350 | 40 | 385 | 705 | 335 | 15 | 885 | 185 |
| Future Volume (vph) | 180 | 335 | 215 | 235 | 350 | 40 | 385 | 705 | 335 | 15 | 885 | 185 |
| Turn Type | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 5 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 5 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 4.0 | 4.0 | 3.0 | 5.0 | 5.0 | 4.0 | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 |
| Minimum Split (s) | 8.0 | 32.0 | 9.0 | 8.0 | 32.0 | 32.0 | 9.0 | 40.0 | 40.0 | 9.0 | 29.0 | 29.0 |
| Total Split (s) | 15.0 | 37.0 | 25.0 | 16.0 | 38.0 | 38.0 | 25.0 | 58.0 | 58.0 | 9.0 | 42.0 | 42.0 |
| Total Split (%) | 12.5% | 30.8% | 20.8% | 13.3% | 31.7% | 31.7% | 20.8% | 48.3% | 48.3% | 7.5% | 35.0% | 35.0% |
| Yellow Time (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120









Actuated Cycle Length: 120













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

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 3: Gun Club Road & Jewell Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 9 s | 58 s | 16 s | 37 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 25 s | 42 s | 15 s | 38 s |

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 191 | 356 | 229 | 242 | 361 | 41 | 405 | 742 | 353 | 16 | 932 | 195 |
| v/c Ratio | 0.78 | 0.85 | 0.33 | 0.85 | 0.82 | 0.08 | 0.80 | 0.42 | 0.37 | 0.05 | 0.73 | 0.28 |
| Control Delay | 76.0 | 63.2 | 15.5 | 80.2 | 58.6 | 0.3 | 61.3 | 20.2 | 3.3 | 15.9 | 39.3 | 5.4 |
| 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 | 76.0 | 63.2 | 15.5 | 80.2 | 58.6 | 0.3 | 61.3 | 20.2 | 3.3 | 15.9 | 39.3 | 5.4 |
| Queue Length 50th (ft) | 75 | 263 | 74 | 95 | 262 | 0 | 155 | 172 | 0 | 5 | 342 | 0 |
| Queue Length 95th (ft) | #117 | 364 | 125 | #157 | 365 | 0 | 211 | 273 | 55 | 17 | #453 | 54 |
| Internal Link Dist (ft) | 2523 | | | | 1479 | | | | 2465 | | 790 | |
| Turn Bay Length (ft) | 220 | | 330 | 300 | | | 485 | | 360 | 200 | | 325 |
| Base Capacity (vph) | 280 | 487 | 721 | 308 | 502 | 545 | 547 | 1763 | 956 | 329 | 1273 | 695 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.68 | 0.73 | 0.32 | 0.79 | 0.72 | 0.08 | 0.74 | 0.42 | 0.37 | 0.05 | 0.73 | 0.28 |

Intersection Summary

























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

HCM 6th Signalized Intersection Summary

11/22/2023

3: Gun Club Road & Jewell Avenue

2027 Background - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 180 | 335 | 215 | 235 | 350 | 40 | 385 | 705 | 335 | 15 | 885 | 185 |
| Future Volume (veh/h) | 180 | 335 | 215 | 235 | 350 | 40 | 385 | 705 | 335 | 15 | 885 | 185 |
| 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 | 1841 | 1841 | 1841 | 1841 | 1841 | 1841 | 1796 | 1796 | 1796 | 1885 | 1885 | 1885 |
| Adj Flow Rate, veh/h | 191 | 356 | 229 | 242 | 361 | 41 | 405 | 742 | 353 | 16 | 932 | 195 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.97 | 0.97 | 0.97 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 1 | 1 | 1 |
| Cap, veh/h | 244 | 401 | 559 | 295 | 429 | 363 | 466 | 1729 | 771 | 276 | 1360 | 607 |
| Arrive On Green | 0.07 | 0.22 | 0.22 | 0.09 | 0.23 | 0.23 | 0.14 | 0.51 | 0.51 | 0.01 | 0.38 | 0.38 |
| Sat Flow, veh/h | 3401 | 1841 | 1560 | 3401 | 1841 | 1560 | 3319 | 3413 | 1522 | 1795 | 3582 | 1598 |
| Grp Volume(v), veh/h | 191 | 356 | 229 | 242 | 361 | 41 | 405 | 742 | 353 | 16 | 932 | 195 |
| Grp Sat Flow(s),veh/h/ln | 1700 | 1841 | 1560 | 1700 | 1841 | 1560 | 1659 | 1706 | 1522 | 1795 | 1791 | 1598 |
| Q Serve(g_s), s | 6.6 | 22.5 | 13.2 | 8.4 | 22.5 | 2.5 | 14.3 | 16.5 | 17.9 | 0.7 | 26.2 | 10.3 |
| Cycle Q Clear(g_c), s | 6.6 | 22.5 | 13.2 | 8.4 | 22.5 | 2.5 | 14.3 | 16.5 | 17.9 | 0.7 | 26.2 | 10.3 |
| 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 | 244 | 401 | 559 | 295 | 429 | 363 | 466 | 1729 | 771 | 276 | 1360 | 607 |
| V/C Ratio(X) | 0.78 | 0.89 | 0.41 | 0.82 | 0.84 | 0.11 | 0.87 | 0.43 | 0.46 | 0.06 | 0.69 | 0.32 |
| Avail Cap(c_a), veh/h | 283 | 491 | 635 | 312 | 506 | 429 | 553 | 1729 | 771 | 312 | 1360 | 607 |
| 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) | 0.81 | 0.81 | 0.81 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.8 | 45.5 | 28.9 | 53.9 | 43.9 | 36.3 | 50.5 | 18.7 | 19.0 | 22.3 | 31.2 | 26.3 |
| Incr Delay (d2), s/veh | 7.9 | 12.9 | 0.4 | 14.1 | 10.7 | 0.1 | 12.3 | 0.8 | 2.0 | 0.1 | 2.8 | 1.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.0 | 11.4 | 4.8 | 4.1 | 11.2 | 0.9 | 6.5 | 6.1 | 6.3 | 0.3 | 11.0 | 4.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 62.7 | 58.4 | 29.3 | 67.9 | 54.6 | 36.4 | 62.8 | 19.5 | 21.0 | 22.4 | 34.0 | 27.7 |
| LnGrp LOS | E | E | C | E | D | D | E | B | C | C | C | C |
| Approach Vol, veh/h | 776 | | | | 644 | | | | 1500 | | | |
| Approach Delay, s/veh | 50.9 | | | | 58.5 | | | | 31.5 | | | |
| Approach LOS | D | | | | E | | | | C | | | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 6.7 | 66.8 | 15.4 | 31.2 | 21.9 | 51.6 | 13.6 | 33.0 | | | | |
| 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 | 4.0 | 52.0 | 11.0 | 32.0 | 20.0 | 36.0 | 10.0 | 33.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.7 | 19.9 | 10.4 | 24.5 | 16.3 | 28.2 | 8.6 | 24.5 | | | | |
| Green Ext Time (p_c), s | 0.0 | 17.0 | 0.0 | 1.7 | 0.5 | 6.1 | 0.0 | 1.3 | | | | |

Intersection Summary

HCM 6th Ctrl Delay 39.8

HCM 6th LOS D

Notes























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

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0.1 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | ↗ | ↘ | ↗↘ | ↗↘ | ↗ |
| Traffic Vol, veh/h | 0 | 20 | 5 | 1415 | 1310 | 15 |
| Future Vol, veh/h | 0 | 20 | 5 | 1415 | 1310 | 15 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | 200 | - | - | 200 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 95 | 95 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 22 | 5 | 1489 | 1379 | 16 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - | 690 | 1395 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | - | 6.94 | 4.14 |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | - | 3.32 | 2.22 |
| Pot Cap-1 Maneuver | 0 | 388 | 486 |
| Stage 1 | 0 | - | - |
| Stage 2 | 0 | - | - |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | - | 388 | 486 |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |

| Approach | EB | NB | SB |
|----------------------|------|----|----|
| HCM Control Delay, s | 14.8 | 0 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT EBLn1 | SBT | SBR |
|-----------------------|-------|-----------|-------|-----|
| Capacity (veh/h) | 486 | - | 388 | - |
| HCM Lane V/C Ratio | 0.011 | - | 0.056 | - |
| HCM Control Delay (s) | 12.5 | - | 14.8 | - |
| HCM Lane LOS | B | - | B | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.2 | - |

| |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 305 | 5 | 95 | 5 | 75 | 15 | 1040 | 50 | 105 | 1205 | 20 |
| Future Volume (vph) | 305 | 5 | 95 | 5 | 75 | 15 | 1040 | 50 | 105 | 1205 | 20 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 8 | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 33.0 | 11.0 | 29.0 | 29.0 | 11.0 | 30.0 | 30.0 | 11.0 | 30.0 | 30.0 |
| Total Split (s) | 16.0 | 33.0 | 12.0 | 29.0 | 29.0 | 11.0 | 34.0 | 34.0 | 11.0 | 34.0 | 34.0 |
| Total Split (%) | 17.8% | 36.7% | 13.3% | 32.2% | 32.2% | 12.2% | 37.8% | 37.8% | 12.2% | 37.8% | 37.8% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 90









Actuated Cycle Length: 90












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

Natural Cycle: 85

Control Type: Actuated-Coordinated

Splits and Phases: 102: Gun Club Road & Yale Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 11 s | 34 s | 12 s | 33 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 11 s | 34 s | 16 s | 29 s |

| |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 332 | 76 | 103 | 5 | 82 | 16 | 1095 | 54 | 114 | 1268 | 22 |
| v/c Ratio | 1.19 | 0.28 | 0.49 | 0.03 | 0.27 | 0.06 | 0.66 | 0.06 | 0.38 | 0.59 | 0.02 |
| Control Delay | 145.9 | 13.3 | 35.9 | 38.0 | 2.1 | 8.4 | 21.8 | 0.1 | 11.4 | 14.3 | 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 |
| Total Delay | 145.9 | 13.3 | 35.9 | 38.0 | 2.1 | 8.4 | 21.8 | 0.1 | 11.4 | 14.3 | 0.1 |
| Queue Length 50th (ft) | ~193 | 3 | 46 | 3 | 0 | 3 | 256 | 0 | 25 | 217 | 0 |
| Queue Length 95th (ft) | #318 | 42 | 88 | 13 | 0 | 11 | 351 | 0 | 48 | 393 | 0 |
| Internal Link Dist (ft) | | 816 | | 718 | | | 2631 | | | 1641 | |
| Turn Bay Length (ft) | 150 | | 350 | | 10 | 300 | | 300 | 300 | | 300 |
| Base Capacity (vph) | 279 | 530 | 212 | 476 | 540 | 254 | 1670 | 843 | 297 | 2135 | 1027 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.19 | 0.14 | 0.49 | 0.01 | 0.15 | 0.06 | 0.66 | 0.06 | 0.38 | 0.59 | 0.02 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.
























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

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary

11/22/2023

102: Gun Club Road & Yale Avenue
2027 Background - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 305 | 5 | 65 | 95 | 5 | 75 | 15 | 1040 | 50 | 105 | 1205 | 20 |
| Future Volume (veh/h) | 305 | 5 | 65 | 95 | 5 | 75 | 15 | 1040 | 50 | 105 | 1205 | 20 |
| 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 | 332 | 5 | 71 | 103 | 5 | 0 | 16 | 1095 | 54 | 114 | 1268 | 22 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.95 | 0.92 | 0.92 | 0.95 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 399 | 14 | 198 | 315 | 165 | | 218 | 1712 | 764 | 296 | 1833 | 818 |
| Arrive On Green | 0.11 | 0.13 | 0.13 | 0.07 | 0.09 | 0.00 | 0.02 | 0.48 | 0.48 | 0.05 | 0.52 | 0.52 |
| Sat Flow, veh/h | 1781 | 105 | 1496 | 1781 | 1870 | 1585 | 1781 | 3554 | 1585 | 1781 | 3554 | 1585 |
| Grp Volume(v), veh/h | 332 | 0 | 76 | 103 | 5 | 0 | 16 | 1095 | 54 | 114 | 1268 | 22 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1601 | 1781 | 1870 | 1585 | 1781 | 1777 | 1585 | 1781 | 1777 | 1585 |
| Q Serve(g_s), s | 10.0 | 0.0 | 3.9 | 4.7 | 0.2 | 0.0 | 0.4 | 20.8 | 1.6 | 2.9 | 24.2 | 0.6 |
| Cycle Q Clear(g_c), s | 10.0 | 0.0 | 3.9 | 4.7 | 0.2 | 0.0 | 0.4 | 20.8 | 1.6 | 2.9 | 24.2 | 0.6 |
| Prop In Lane | 1.00 | | 0.93 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 399 | 0 | 212 | 315 | 165 | | 218 | 1712 | 764 | 296 | 1833 | 818 |
| V/C Ratio(X) | 0.83 | 0.00 | 0.36 | 0.33 | 0.03 | | 0.07 | 0.64 | 0.07 | 0.38 | 0.69 | 0.03 |
| Avail Cap(c_a), veh/h | 399 | 0 | 480 | 315 | 478 | | 285 | 1712 | 764 | 302 | 1833 | 818 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.9 | 0.0 | 35.6 | 34.1 | 37.5 | 0.0 | 13.9 | 17.5 | 12.5 | 13.6 | 16.4 | 10.7 |
| Incr Delay (d2), s/veh | 14.0 | 0.0 | 1.0 | 0.6 | 0.1 | 0.0 | 0.1 | 1.8 | 0.2 | 0.8 | 2.2 | 0.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.8 | 0.0 | 1.6 | 2.0 | 0.1 | 0.0 | 0.1 | 7.5 | 0.6 | 1.0 | 8.5 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 49.9 | 0.0 | 36.6 | 34.7 | 37.6 | 0.0 | 14.1 | 19.3 | 12.7 | 14.4 | 18.6 | 10.8 |
| LnGrp LOS | D | A | D | C | D | | B | B | B | B | B | B |
| Approach Vol, veh/h | | 408 | | | 108 | | | 1165 | | | 1404 | |
| Approach Delay, s/veh | | 47.4 | | | 34.9 | | | 18.9 | | | 18.1 | |
| Approach LOS | | D | | | C | | | B | | | B | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 10.7 | 49.4 | 12.0 | 17.9 | 7.6 | 52.4 | 16.0 | 13.9 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 5.0 | 28.0 | 6.0 | 27.0 | 5.0 | 28.0 | 10.0 | 23.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 4.9 | 22.8 | 6.7 | 5.9 | 2.4 | 26.2 | 12.0 | 2.2 | | | | |
| Green Ext Time (p_c), s | 0.0 | 3.0 | 0.0 | 0.3 | 0.0 | 1.3 | 0.0 | 0.0 | | | | |







Intersection Summary

HCM 6th Ctrl Delay 22.9
HCM 6th LOS C

Notes

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

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

| Intersection | | | | | | |
|--------------------------|---|---|---|---|---|---|
| Int Delay, s/veh | 3.4 | | | | | |
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations |  |  |  |  |  |  |
| Traffic Vol, veh/h | 25 | 25 | 1400 | 15 | 35 | 1300 |
| Future Vol, veh/h | 25 | 25 | 1400 | 15 | 35 | 1300 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 350 | 0 | - | 350 | 350 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 27 | 27 | 1522 | 16 | 38 | 1413 |

| Major/Minor | Minor1 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 2305 | 761 | 0 |
| Stage 1 | 1522 | - | - |
| Stage 2 | 783 | - | - |
| Critical Hdwy | 6.84 | 6.94 | - |
| Critical Hdwy Stg 1 | 5.84 | - | - |
| Critical Hdwy Stg 2 | 5.84 | - | - |
| Follow-up Hdwy | 3.52 | 3.32 | - |
| Pot Cap-1 Maneuver | 32 | 348 | - |
| Stage 1 | 166 | - | - |
| Stage 2 | 411 | - | - |
| Platoon blocked, % | | - | - |
| Mov Cap-1 Maneuver | 29 | 348 | - |
| Mov Cap-2 Maneuver | 29 | - | - |
| Stage 1 | 166 | - | - |
| Stage 2 | 374 | - | - |

| Approach | WB | NB | SB |
|----------------------|-------|----|-----|
| HCM Control Delay, s | 180.2 | 0 | 0.4 |
| HCM LOS | F | | |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1WBLn2 | SBL | SBT |
|-----------------------|-----|-----------------|-------|-----|
| Capacity (veh/h) | - | - 29 348 | 428 | - |
| HCM Lane V/C Ratio | - | - 0.937 0.078 | 0.089 | - |
| HCM Control Delay (s) | - | - \$ 344.2 16.2 | 14.2 | - |
| HCM Lane LOS | - | - F C | B | - |
| HCM 95th %tile Q(veh) | - | - 3.1 0.3 | 0.3 | - |

Intersection Capacity Worksheets: 2050 Background

| | → | ↘ | ↙ | ← | ↓ | ↗ |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Configurations | ↑↑↑ | ↑ | ↘↙ | ↑↑↑ | ↑ | ↗ |
| Traffic Volume (vph) | 1655 | 260 | 320 | 2640 | 5 | 250 |
| Future Volume (vph) | 1655 | 260 | 320 | 2640 | 5 | 250 |
| Turn Type | NA | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 3 | 8 | 6 | |
| Permitted Phases | | 4 | 8 | | | 6 |
| Detector Phase | 4 | 4 | 3 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.0 | 25.0 | 10.0 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 48.0 | 48.0 | 14.0 | 62.0 | 28.0 | 28.0 |
| Total Split (%) | 53.3% | 53.3% | 15.6% | 68.9% | 31.1% | 31.1% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Max | C-Max | None | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90

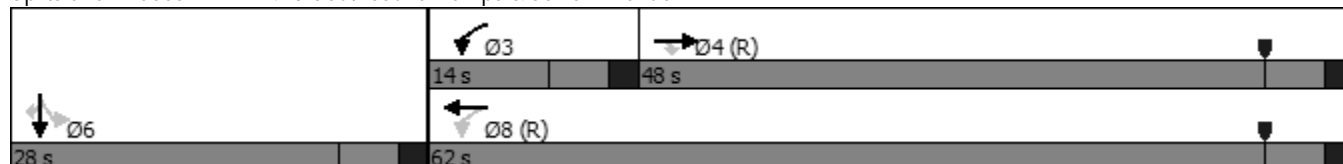
Actuated Cycle Length: 90







Offset: 68 (76%), Referenced to phase 4:EBT and 8:WBTL, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 1: E-470 Southbound Ramps & Jewell Avenue



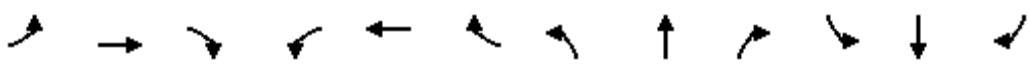
| |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Group Flow (vph) | 1689 | 265 | 327 | 2694 | 282 | 255 |
| v/c Ratio | 0.72 | 0.30 | 0.71 | 0.85 | 0.66 | 0.55 |
| Control Delay | 21.4 | 2.9 | 21.4 | 22.4 | 39.3 | 21.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay | 21.4 | 2.9 | 21.4 | 22.7 | 39.3 | 21.8 |
| Queue Length 50th (ft) | 271 | 0 | 76 | 441 | 145 | 70 |
| Queue Length 95th (ft) | 327 | 40 | m75 | m429 | 232 | 148 |
| Internal Link Dist (ft) | 679 | | | 530 | 532 | |
| Turn Bay Length (ft) | | 300 | 250 | | | |
| Base Capacity (vph) | 2357 | 875 | 465 | 3164 | 425 | 461 |
| Starvation Cap Reductn | 0 | 0 | 0 | 81 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.72 | 0.30 | 0.70 | 0.87 | 0.66 | 0.55 |
| Intersection Summary | | | | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | | | | |

HCM 6th Signalized Intersection Summary

1: E-470 Southbound Ramps & Jewell Avenue













11/22/2023

2050 Background - AM Peak Hour

| |  | | | | | | | | | | | |
|------------------------------|--|------|------|------|------|------|-----|------|-----|------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↑↑↑ | ↗ | ↘ | ↑↑↑ | | | | | | ↖ | ↗ |
| Traffic Volume (veh/h) | 0 | 1655 | 260 | 320 | 2640 | 0 | 0 | 0 | 0 | 260 | 5 | 250 |
| Future Volume (veh/h) | 0 | 1655 | 260 | 320 | 2640 | 0 | 0 | 0 | 0 | 260 | 5 | 250 |
| Initial Q (Qb), veh | 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 |
| Parking Bus, Adj | 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 | |
| Adj Sat Flow, veh/h/ln | 0 | 1856 | 1856 | 1870 | 1870 | 0 | | | | 1841 | 1841 | 1841 |
| Adj Flow Rate, veh/h | 0 | 1689 | 265 | 327 | 2694 | 0 | | | | 277 | 5 | 0 |
| Peak Hour Factor | 0.92 | 0.98 | 0.98 | 0.98 | 0.98 | 0.92 | | | | 0.94 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 2 | 2 | 0 | | | | 4 | 4 | 4 |
| Cap, veh/h | 0 | 2458 | 763 | 502 | 3177 | 0 | | | | 421 | 8 | |
| Arrive On Green | 0.00 | 0.49 | 0.49 | 0.14 | 1.00 | 0.00 | | | | 0.24 | 0.24 | 0.00 |
| Sat Flow, veh/h | 0 | 5233 | 1572 | 3456 | 5274 | 0 | | | | 1723 | 31 | 1560 |
| Grp Volume(v), veh/h | 0 | 1689 | 265 | 327 | 2694 | 0 | | | | 282 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1689 | 1572 | 1728 | 1702 | 0 | | | | 1755 | 0 | 1560 |
| Q Serve(g_s), s | 0.0 | 23.2 | 9.4 | 4.1 | 0.0 | 0.0 | | | | 13.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 23.2 | 9.4 | 4.1 | 0.0 | 0.0 | | | | 13.0 | 0.0 | 0.0 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 0.00 | | | | 0.98 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 2458 | 763 | 502 | 3177 | 0 | | | | 429 | 0 | |
| V/C Ratio(X) | 0.00 | 0.69 | 0.35 | 0.65 | 0.85 | 0.00 | | | | 0.66 | 0.00 | |
| Avail Cap(c_a), veh/h | 0 | 2458 | 763 | 567 | 3177 | 0 | | | | 429 | 0 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(l) | 0.00 | 1.00 | 1.00 | 0.09 | 0.09 | 0.00 | | | | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 17.9 | 14.3 | 15.8 | 0.0 | 0.0 | | | | 30.6 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 1.6 | 1.2 | 0.2 | 0.3 | 0.0 | | | | 7.7 | 0.0 | 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 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 8.2 | 3.2 | 1.4 | 0.1 | 0.0 | | | | 6.3 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 19.5 | 15.6 | 16.0 | 0.3 | 0.0 | | | | 38.3 | 0.0 | 0.0 |
| LnGrp LOS | A | B | B | B | A | A | | | | D | A | |
| Approach Vol, veh/h | | 1954 | | | 3021 | | | | | | 282 | |
| Approach Delay, s/veh | | 18.9 | | | 2.0 | | | | | | 38.3 | |
| Approach LOS | | B | | | A | | | | | | D | |
| Timer - Assigned Phs | | | 3 | 4 | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | | | 12.3 | 49.7 | | 28.0 | | 62.0 | | | | |
| Change Period (Y+Rc), s | | | 6.0 | 6.0 | | 6.0 | | 6.0 | | | | |
| Max Green Setting (Gmax), s | | | 8.0 | 42.0 | | 22.0 | | 56.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | | 6.1 | 25.2 | | 15.0 | | 2.0 | | | | |
| Green Ext Time (p_c), s | | | 0.2 | 11.1 | | 0.9 | | 39.5 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 10.2 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

Notes

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

| |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
| Lane Configurations |  |  |  |  |  |  |
| Traffic Volume (vph) | 280 | 1635 | 2610 | 450 | 0 | 250 |
| Future Volume (vph) | 280 | 1635 | 2610 | 450 | 0 | 250 |
| Turn Type | pm+pt | NA | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 8 | | 2 | |
| Permitted Phases | 4 | | | 8 | | 2 |
| Detector Phase | 7 | 4 | 8 | 8 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 3.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.5 | 25.0 | 25.0 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 11.0 | 63.0 | 52.0 | 52.0 | 27.0 | 27.0 |
| Total Split (%) | 12.2% | 70.0% | 57.8% | 57.8% | 30.0% | 30.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Recall Mode | None | C-Max | C-Max | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90





Actuated Cycle Length: 90

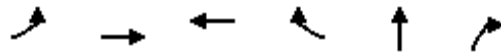
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 2: E-470 Northbound Ramps & Jewell Avenue

| | | |
|--|--|--|
|  Ø2 |  Ø4 (R) | |
| 27 s | 63 s | |
| |  Ø7 |  Ø8 (R) |
| | 11 s | 52 s |



| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
|-------------------------|------|------|------|------|------|------|
| Lane Group Flow (vph) | 286 | 1668 | 2663 | 459 | 357 | 255 |
| v/c Ratio | 0.85 | 0.54 | 1.04 | 0.46 | 0.86 | 0.56 |
| Control Delay | 44.7 | 2.6 | 54.0 | 3.4 | 55.5 | 22.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 44.7 | 2.6 | 54.0 | 3.4 | 55.5 | 22.6 |
| Queue Length 50th (ft) | 35 | 28 | ~607 | 10 | 196 | 71 |
| Queue Length 95th (ft) | m#91 | 41 | #702 | 57 | #350 | 149 |
| Internal Link Dist (ft) | | 530 | 2523 | | 717 | |
| Turn Bay Length (ft) | 250 | | | | | 175 |
| Base Capacity (vph) | 338 | 3098 | 2549 | 1001 | 413 | 452 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.85 | 0.54 | 1.04 | 0.46 | 0.86 | 0.56 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.



















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

HCM 6th Signalized Intersection Summary

2: E-470 Northbound Ramps & Jewell Avenue

11/22/2023

2050 Background - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | | |  |  | |  |  | | | |
| Traffic Volume (veh/h) | 280 | 1635 | 0 | 0 | 2610 | 450 | 350 | 0 | 250 | 0 | 0 | 0 |
| Future Volume (veh/h) | 280 | 1635 | 0 | 0 | 2610 | 450 | 350 | 0 | 250 | 0 | 0 | 0 |
| Initial Q (Qb), veh | 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 | | | |
| Parking Bus, Adj | 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 | | | | | |
| Adj Sat Flow, veh/h/ln | 1811 | 1811 | 0 | 0 | 1841 | 1841 | 1870 | 1870 | 1870 | | | |
| Adj Flow Rate, veh/h | 286 | 1668 | 0 | 0 | 2663 | 459 | 357 | 0 | 0 | | | |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | | | |
| Percent Heavy Veh, % | 6 | 6 | 0 | 0 | 4 | 4 | 2 | 2 | 2 | | | |
| Cap, veh/h | 346 | 3131 | 0 | 0 | 2568 | 797 | 416 | 0 | | | | |
| Arrive On Green | 0.11 | 1.00 | 0.00 | 0.00 | 0.51 | 0.51 | 0.23 | 0.00 | 0.00 | | | |
| Sat Flow, veh/h | 3346 | 5107 | 0 | 0 | 5191 | 1560 | 1781 | 0 | 1585 | | | |
| Grp Volume(v), veh/h | 286 | 1668 | 0 | 0 | 2663 | 459 | 357 | 0 | 0 | | | |
| Grp Sat Flow(s),veh/h/ln | 1673 | 1648 | 0 | 0 | 1675 | 1560 | 1781 | 0 | 1585 | | | |
| Q Serve(g_s), s | 3.6 | 0.0 | 0.0 | 0.0 | 46.0 | 18.3 | 17.3 | 0.0 | 0.0 | | | |
| Cycle Q Clear(g_c), s | 3.6 | 0.0 | 0.0 | 0.0 | 46.0 | 18.3 | 17.3 | 0.0 | 0.0 | | | |
| Prop In Lane | 1.00 | | 0.00 | 0.00 | | 1.00 | 1.00 | | 1.00 | | | |
| Lane Grp Cap(c), veh/h | 346 | 3131 | 0 | 0 | 2568 | 797 | 416 | 0 | | | | |
| V/C Ratio(X) | 0.83 | 0.53 | 0.00 | 0.00 | 1.04 | 0.58 | 0.86 | 0.00 | | | | |
| Avail Cap(c_a), veh/h | 346 | 3131 | 0 | 0 | 2568 | 797 | 416 | 0 | | | | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | |
| Upstream Filter(I) | 0.63 | 0.63 | 0.00 | 0.00 | 0.09 | 0.09 | 1.00 | 0.00 | 0.00 | | | |
| Uniform Delay (d), s/veh | 19.9 | 0.0 | 0.0 | 0.0 | 22.0 | 15.2 | 33.1 | 0.0 | 0.0 | | | |
| Incr Delay (d2), s/veh | 10.1 | 0.4 | 0.0 | 0.0 | 18.2 | 0.3 | 20.0 | 0.0 | 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 | | | |
| %ile BackOfQ(50%),veh/ln | 1.8 | 0.1 | 0.0 | 0.0 | 19.5 | 5.7 | 9.6 | 0.0 | 0.0 | | | |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 30.0 | 0.4 | 0.0 | 0.0 | 40.2 | 15.5 | 53.1 | 0.0 | 0.0 | | | |
| LnGrp LOS | C | A | A | A | F | B | D | A | | | | |
| Approach Vol, veh/h | 1954 | | | 3122 | | | 357 | | | | | |
| Approach Delay, s/veh | 4.7 | | | 36.6 | | | 53.1 | | | | | |
| Approach LOS | A | | | D | | | D | | | | | |
| Timer - Assigned Phs | 2 | | | 4 | | | 7 | | | 8 | | |
| Phs Duration (G+Y+Rc), s | 27.0 | | | 63.0 | | | 11.0 | | | 52.0 | | |
| Change Period (Y+Rc), s | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | | |
| Max Green Setting (Gmax), s | 21.0 | | | 57.0 | | | 5.0 | | | 46.0 | | |
| Max Q Clear Time (g_c+I1), s | 19.3 | | | 2.0 | | | 5.6 | | | 48.0 | | |
| Green Ext Time (p_c), s | 0.4 | | | 17.9 | | | 0.0 | | | 0.0 | | |

























Intersection Summary

| | |
|--------------------|------|
| HCM 6th Ctrl Delay | 26.2 |
| HCM 6th LOS | C |

Notes

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

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

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 365 | 1110 | 410 | 480 | 2355 | 505 | 395 | 1580 | 330 | 285 | 1020 | 310 |
| Future Volume (vph) | 365 | 1110 | 410 | 480 | 2355 | 505 | 395 | 1580 | 330 | 285 | 1020 | 310 |
| Turn Type | Prot | NA | Free | Prot | NA | pm+ov | Prot | NA | Free | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | 7 |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 8.0 | | 3.0 | 8.0 | 4.0 | 5.0 | 8.0 | | 4.0 | 8.0 | 3.0 |
| Minimum Split (s) | 9.5 | 40.0 | | 9.5 | 40.0 | 9.5 | 9.5 | 40.0 | | 9.5 | 29.0 | 9.5 |
| Total Split (s) | 14.2 | 48.8 | | 34.2 | 68.8 | 16.0 | 24.2 | 51.0 | | 16.0 | 42.8 | 14.2 |
| Total Split (%) | 9.5% | 32.5% | | 22.8% | 45.9% | 10.7% | 16.1% | 34.0% | | 10.7% | 28.5% | 9.5% |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.5 | 4.0 | | 3.0 | 4.0 | 3.0 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 | | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | 5.0 | 4.5 | 6.0 | | 5.0 | 6.0 | 5.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lead | Lag | | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | C-Max | | None | C-Max | None |

Intersection Summary

Cycle Length: 150









Actuated Cycle Length: 150













Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 3: Gun Club Road & Jewell Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 16 s | 51 s | 34.2 s | 48.8 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 24.2 s | 42.8 s | 14.2 s | 68.8 s |

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 372 | 1133 | 418 | 490 | 2403 | 515 | 403 | 1612 | 337 | 291 | 1041 | 316 |
| v/c Ratio | 1.84 | 0.73 | 0.27 | 0.90 | 1.15 | 0.59 | 0.91 | 1.07 | 0.21 | 1.21 | 0.87 | 0.52 |
| Control Delay | 432.9 | 49.3 | 0.4 | 81.7 | 113.7 | 22.6 | 89.6 | 92.9 | 0.3 | 183.2 | 63.2 | 26.0 |
| 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 | 432.9 | 49.3 | 0.4 | 81.7 | 113.7 | 22.6 | 89.6 | 92.9 | 0.3 | 183.2 | 63.2 | 26.0 |
| Queue Length 50th (ft) | ~282 | 362 | 0 | 245 | ~1009 | 277 | 203 | ~636 | 0 | ~178 | 361 | 146 |
| Queue Length 95th (ft) | #389 | 438 | 0 | 300 | #1095 | 396 | #298 | #732 | 0 | #277 | 420 | 244 |
| Internal Link Dist (ft) | | 2523 | | | 1479 | | | 1470 | | | 790 | |
| Turn Bay Length (ft) | 420 | | 330 | 300 | | 565 | 485 | | 300 | 200 | | 325 |
| Base Capacity (vph) | 202 | 1556 | 1524 | 655 | 2088 | 868 | 446 | 1510 | 1568 | 240 | 1195 | 608 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.84 | 0.73 | 0.27 | 0.75 | 1.15 | 0.59 | 0.90 | 1.07 | 0.21 | 1.21 | 0.87 | 0.52 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

























Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary

11/22/2023

3: Gun Club Road & Jewell Avenue

2050 Background - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 365 | 1110 | 410 | 480 | 2355 | 505 | 395 | 1580 | 330 | 285 | 1020 | 310 |
| Future Volume (veh/h) | 365 | 1110 | 410 | 480 | 2355 | 505 | 395 | 1580 | 330 | 285 | 1020 | 310 |
| 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 | 1811 | 1811 | 1811 | 1841 | 1841 | 1841 | 1856 | 1856 | 1856 | 1796 | 1796 | 1796 |
| Adj Flow Rate, veh/h | 372 | 1133 | 0 | 490 | 2403 | 515 | 403 | 1612 | 0 | 291 | 1041 | 316 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 6 | 6 | 6 | 4 | 4 | 4 | 3 | 3 | 3 | 7 | 7 | 7 |
| Cap, veh/h | 205 | 1603 | | 530 | 2104 | 767 | 444 | 1520 | | 243 | 1211 | 469 |
| Arrive On Green | 0.06 | 0.32 | 0.00 | 0.16 | 0.42 | 0.42 | 0.13 | 0.30 | 0.00 | 0.07 | 0.25 | 0.25 |
| Sat Flow, veh/h | 3346 | 4944 | 1535 | 3401 | 5025 | 1560 | 3428 | 5066 | 1572 | 3319 | 4904 | 1522 |
| Grp Volume(v), veh/h | 372 | 1133 | 0 | 490 | 2403 | 515 | 403 | 1612 | 0 | 291 | 1041 | 316 |
| Grp Sat Flow(s),veh/h/ln | 1673 | 1648 | 1535 | 1700 | 1675 | 1560 | 1714 | 1689 | 1572 | 1659 | 1635 | 1522 |
| Q Serve(g_s), s | 9.2 | 30.1 | 0.0 | 21.3 | 62.8 | 37.6 | 17.4 | 45.0 | 0.0 | 11.0 | 30.4 | 27.2 |
| Cycle Q Clear(g_c), s | 9.2 | 30.1 | 0.0 | 21.3 | 62.8 | 37.6 | 17.4 | 45.0 | 0.0 | 11.0 | 30.4 | 27.2 |
| 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 | 205 | 1603 | | 530 | 2104 | 767 | 444 | 1520 | | 243 | 1211 | 469 |
| V/C Ratio(X) | 1.81 | 0.71 | | 0.92 | 1.14 | 0.67 | 0.91 | 1.06 | | 1.20 | 0.86 | 0.67 |
| Avail Cap(c_a), veh/h | 205 | 1603 | | 662 | 2104 | 767 | 450 | 1520 | | 243 | 1211 | 469 |
| 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 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 70.4 | 44.4 | 0.0 | 62.4 | 43.6 | 28.9 | 64.4 | 52.5 | 0.0 | 69.5 | 54.0 | 45.3 |
| Incr Delay (d2), s/veh | 381.1 | 1.9 | 0.0 | 15.1 | 70.2 | 4.0 | 21.7 | 41.1 | 0.0 | 121.0 | 8.1 | 7.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 14.7 | 12.3 | 0.0 | 10.2 | 38.6 | 14.4 | 8.7 | 24.0 | 0.0 | 8.6 | 13.0 | 11.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 451.5 | 46.3 | 0.0 | 77.5 | 113.8 | 32.9 | 86.1 | 93.6 | 0.0 | 190.5 | 62.0 | 52.8 |
| LnGrp LOS | F | D | | E | F | C | F | F | | F | E | D |
| Approach Vol, veh/h | 1505 | | | | 3408 | | | | 2015 | | | |
| Approach Delay, s/veh | 146.5 | | | | 96.4 | | | | 92.1 | | | |
| Approach LOS | F | | | | F | | | | F | | | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 16.0 | 51.0 | 28.4 | 54.6 | 23.9 | 43.1 | 14.2 | 68.8 | | | | |
| Change Period (Y+Rc), s | 5.0 | 6.0 | 5.0 | 6.0 | 4.5 | 6.0 | 5.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 11.0 | 45.0 | 29.2 | 42.8 | 19.7 | 36.8 | 9.2 | 62.8 | | | | |
| Max Q Clear Time (g_c+I1), s | 13.0 | 47.0 | 23.3 | 32.1 | 19.4 | 32.4 | 11.2 | 64.8 | | | | |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.1 | 8.3 | 0.1 | 3.8 | 0.0 | 0.0 | | | | |

Intersection Summary

| | |
|--------------------|-------|
| HCM 6th Ctrl Delay | 101.6 |
| HCM 6th LOS | F |

Notes

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

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

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0.2 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | ↗ | ↘ | ↑↑↑ | ↑↑↑ | ↗ |
| Traffic Vol, veh/h | 0 | 5 | 50 | 2305 | 1755 | 100 |
| Future Vol, veh/h | 0 | 5 | 50 | 2305 | 1755 | 100 |
| 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 | 250 | - | - | 250 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 98 | 98 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 5 | 54 | 2352 | 1791 | 109 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - 896 | 1900 | 0 - 0 |
| Stage 1 | - | - | - - - |
| Stage 2 | - | - | - - - |
| Critical Hdwy | - 7.14 | 5.34 | - - - |
| Critical Hdwy Stg 1 | - | - | - - - |
| Critical Hdwy Stg 2 | - | - | - - - |
| Follow-up Hdwy | - 3.92 | 3.12 | - - - |
| Pot Cap-1 Maneuver | 0 *513 | *645 | - - - |
| Stage 1 | 0 | - | - - - |
| Stage 2 | 0 | - | - - - |
| Platoon blocked, % | 1 | 1 | - - - |
| Mov Cap-1 Maneuver | - *513 | *645 | - - - |
| Mov Cap-2 Maneuver | - | - | - - - |
| Stage 1 | - | - | - - - |
| Stage 2 | - | - | - - - |





















| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 12.1 | 0.3 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT EBLn1 | SBT | SBR |
|-----------------------|-------|-----------|-----|-----|
| Capacity (veh/h) | * 645 | - 513 | - | - |
| HCM Lane V/C Ratio | 0.084 | - 0.011 | - | - |
| HCM Control Delay (s) | 11.1 | - 12.1 | - | - |
| HCM Lane LOS | B | - B | - | - |
| HCM 95th %tile Q(veh) | 0.3 | - 0 | - | - |

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

Timings
11/22/2023

102: Gun Club Road & Yale Avenue
2050 Background - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 50 | 5 | 340 | 5 | 100 | 2095 | 150 | 300 | 1335 | 125 |
| Future Volume (vph) | 50 | 5 | 340 | 5 | 100 | 2095 | 150 | 300 | 1335 | 125 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 33.0 | 11.0 | 33.0 | 11.0 | 30.0 | 30.0 | 11.0 | 30.0 | 30.0 |
| Total Split (s) | 11.0 | 33.0 | 11.0 | 33.0 | 15.0 | 59.0 | 59.0 | 17.0 | 61.0 | 61.0 |
| Total Split (%) | 9.2% | 27.5% | 9.2% | 27.5% | 12.5% | 49.2% | 49.2% | 14.2% | 50.8% | 50.8% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | Max | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120









Actuated Cycle Length: 120











Offset: 53 (44%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 95

Control Type: Actuated-Coordinated

Splits and Phases: 102: Gun Club Road & Yale Avenue

| | | | |
|---|---|--|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 17 s | 59 s | 11 s | 33 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 15 s | 61 s | 11 s | 33 s |

| |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 54 | 16 | 370 | 233 | 109 | 2138 | 163 | 326 | 1362 | 136 |
| v/c Ratio | 0.31 | 0.07 | 0.43 | 0.43 | 0.49 | 0.94 | 0.21 | 0.76 | 0.58 | 0.17 |
| Control Delay | 43.1 | 23.3 | 36.2 | 10.5 | 19.8 | 41.8 | 5.7 | 34.4 | 24.8 | 3.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 43.1 | 23.3 | 36.2 | 10.5 | 19.8 | 41.8 | 5.7 | 34.4 | 24.8 | 3.6 |
| Queue Length 50th (ft) | 42 | 4 | 112 | 18 | 35 | 572 | 12 | 72 | 277 | 0 |
| Queue Length 95th (ft) | 61 | 22 | 155 | 89 | 62 | #694 | 52 | 123 | 327 | 35 |
| Internal Link Dist (ft) | | 816 | | 845 | | 4562 | | | 1641 | |
| Turn Bay Length (ft) | 150 | | | | 250 | | 250 | 250 | | 250 |
| Base Capacity (vph) | 176 | 384 | 865 | 540 | 233 | 2267 | 781 | 443 | 2364 | 808 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.31 | 0.04 | 0.43 | 0.43 | 0.47 | 0.94 | 0.21 | 0.74 | 0.58 | 0.17 |























Intersection Summary

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

HCM 6th Signalized Intersection Summary

11/22/2023

102: Gun Club Road & Yale Avenue
2050 Background - AM Peak Hour












| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  | |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 50 | 5 | 10 | 340 | 5 | 210 | 100 | 2095 | 150 | 300 | 1335 | 125 |
| Future Volume (veh/h) | 50 | 5 | 10 | 340 | 5 | 210 | 100 | 2095 | 150 | 300 | 1335 | 125 |
| 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 | 54 | 5 | 0 | 370 | 5 | 0 | 109 | 2138 | 163 | 326 | 1362 | 136 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.98 | 0.92 | 0.92 | 0.98 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 430 | 408 | | 855 | 421 | | 252 | 2405 | 747 | 387 | 2517 | 781 |
| Arrive On Green | 0.03 | 0.22 | 0.00 | 0.04 | 0.22 | 0.00 | 0.05 | 0.47 | 0.47 | 0.07 | 0.49 | 0.49 |
| Sat Flow, veh/h | 1781 | 1870 | 0 | 3456 | 1870 | 0 | 1781 | 5106 | 1585 | 3456 | 5106 | 1585 |
| Grp Volume(v), veh/h | 54 | 5 | 0 | 370 | 5 | 0 | 109 | 2138 | 163 | 326 | 1362 | 136 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1870 | 0 | 1728 | 1870 | 0 | 1781 | 1702 | 1585 | 1728 | 1702 | 1585 |
| Q Serve(g_s), s | 2.8 | 0.3 | 0.0 | 5.0 | 0.2 | 0.0 | 3.8 | 45.7 | 7.3 | 6.0 | 22.1 | 5.7 |
| Cycle Q Clear(g_c), s | 2.8 | 0.3 | 0.0 | 5.0 | 0.2 | 0.0 | 3.8 | 45.7 | 7.3 | 6.0 | 22.1 | 5.7 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 430 | 408 | | 855 | 421 | | 252 | 2405 | 747 | 387 | 2517 | 781 |
| V/C Ratio(X) | 0.13 | 0.01 | | 0.43 | 0.01 | | 0.43 | 0.89 | 0.22 | 0.84 | 0.54 | 0.17 |
| Avail Cap(c_a), veh/h | 442 | 421 | | 855 | 421 | | 302 | 2405 | 747 | 465 | 2517 | 781 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.5 | 36.8 | 0.0 | 37.3 | 36.1 | 0.0 | 17.1 | 28.9 | 18.7 | 27.9 | 21.0 | 16.9 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.0 | 0.3 | 0.1 | 0.0 | 1.2 | 5.4 | 0.7 | 11.4 | 0.8 | 0.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.2 | 0.1 | 0.0 | 2.2 | 0.1 | 0.0 | 1.5 | 17.9 | 2.8 | 2.8 | 8.2 | 2.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 34.7 | 36.8 | 0.0 | 37.6 | 36.2 | 0.0 | 18.3 | 34.3 | 19.4 | 39.3 | 21.9 | 17.4 |
| LnGrp LOS | C | D | | D | D | | B | C | B | D | C | B |
| Approach Vol, veh/h | | 59 | | | 375 | | | 2410 | | | 1824 | |
| Approach Delay, s/veh | | 34.8 | | | 37.6 | | | 32.5 | | | 24.7 | |
| Approach LOS | | C | | | D | | | C | | | C | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 14.3 | 62.5 | 11.0 | 32.2 | 11.7 | 65.2 | 10.2 | 33.0 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 11.0 | 53.0 | 5.0 | 27.0 | 9.0 | 55.0 | 5.0 | 27.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 8.0 | 47.7 | 7.0 | 2.3 | 5.8 | 24.1 | 4.8 | 2.2 | | | | |
| Green Ext Time (p_c), s | 0.3 | 4.6 | 0.0 | 0.0 | 0.1 | 10.9 | 0.0 | 0.0 | | | | |

Intersection Summary

HCM 6th Ctrl Delay 29.9
HCM 6th LOS C

Notes

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

| |  |  |  |  |  | |
|----------------------|---|---|---|---|---|---|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations |  |  |  |  |  |  |
| Traffic Volume (vph) | 25 | 50 | 2255 | 50 | 80 | 1830 |
| Future Volume (vph) | 25 | 50 | 2255 | 50 | 80 | 1830 |
| Turn Type | Prot | Free | NA | Perm | pm+pt | NA |
| Protected Phases | 7 | | 2 | | 1 | 6 |
| Permitted Phases | | Free | | 2 | 6 | |
| Detector Phase | 7 | | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 11.0 | | 28.0 | 28.0 | 11.0 | 28.0 |
| Total Split (s) | 11.0 | | 66.0 | 66.0 | 13.0 | 79.0 |
| Total Split (%) | 12.2% | | 73.3% | 73.3% | 14.4% | 87.8% |
| Yellow Time (s) | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | |
| Recall Mode | None | | C-Max | C-Max | None | C-Max |

Intersection Summary

Cycle Length: 90





Actuated Cycle Length: 90







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

Natural Cycle: 60

Control Type: Actuated-Coordinated













Splits and Phases: 103: Gun Club Road & Addison Avenue

| | | |
|--|--|--|
|  Ø1 |  Ø2 (R) | |
| 13 s | 66 s | |
|  Ø6 (R) | |  Ø7 |
| 79 s | | 11 s |

| |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Group Flow (vph) | 27 | 54 | 2301 | 54 | 87 | 1867 |
| v/c Ratio | 0.28 | 0.03 | 0.57 | 0.04 | 0.42 | 0.40 |
| Control Delay | 48.1 | 0.0 | 6.3 | 1.6 | 14.0 | 1.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 48.1 | 0.0 | 6.3 | 1.6 | 14.0 | 1.5 |
| Queue Length 50th (ft) | 15 | 0 | 126 | 0 | 0 | 0 |
| Queue Length 95th (ft) | 42 | 0 | 304 | 11 | 45 | 99 |
| Internal Link Dist (ft) | 1036 | | 985 | | | 915 |
| Turn Bay Length (ft) | | | | 300 | 300 | |
| Base Capacity (vph) | 98 | 1583 | 4009 | 1259 | 221 | 4701 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.28 | 0.03 | 0.57 | 0.04 | 0.39 | 0.40 |
| Intersection Summary | | | | | | |

HCM 6th Signalized Intersection Summary
11/22/2023

103: Gun Club Road & Addison Avenue
2050 Background - AM Peak Hour

| |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 25 | 50 | 2255 | 50 | 80 | 1830 |
| Future Volume (veh/h) | 25 | 50 | 2255 | 50 | 80 | 1830 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | No | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 27 | 0 | 2301 | 54 | 87 | 1867 |
| Peak Hour Factor | 0.92 | 0.92 | 0.98 | 0.92 | 0.92 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 49 | | 3694 | 1147 | 243 | 4286 |
| Arrive On Green | 0.03 | 0.00 | 0.72 | 0.72 | 0.05 | 0.84 |
| Sat Flow, veh/h | 1781 | 1585 | 5274 | 1585 | 1781 | 5274 |
| Grp Volume(v), veh/h | 27 | 0 | 2301 | 54 | 87 | 1867 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1585 | 1702 | 1585 | 1781 | 1702 |
| Q Serve(g_s), s | 1.3 | 0.0 | 20.4 | 0.9 | 0.9 | 8.3 |
| Cycle Q Clear(g_c), s | 1.3 | 0.0 | 20.4 | 0.9 | 0.9 | 8.3 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 49 | | 3694 | 1147 | 243 | 4286 |
| V/C Ratio(X) | 0.56 | | 0.62 | 0.05 | 0.36 | 0.44 |
| Avail Cap(c_a), veh/h | 99 | | 3694 | 1147 | 294 | 4286 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.2 | 0.0 | 6.3 | 3.6 | 8.5 | 1.8 |
| Incr Delay (d2), s/veh | 9.6 | 0.0 | 0.8 | 0.1 | 0.9 | 0.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 0.0 | 4.3 | 0.2 | 0.5 | 0.1 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d),s/veh | 52.8 | 0.0 | 7.1 | 3.6 | 9.4 | 2.2 |
| LnGrp LOS | D | | A | A | A | A |
| Approach Vol, veh/h | 27 | | 2355 | | | 1954 |
| Approach Delay, s/veh | 52.8 | | 7.0 | | | 2.5 |
| Approach LOS | D | | A | | | A |
| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
| Phs Duration (G+Y+Rc), s | 10.4 | 71.1 | | 8.5 | | 81.5 |
| Change Period (Y+Rc), s | 6.0 | 6.0 | | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 7.0 | 60.0 | | 5.0 | | 73.0 |
| Max Q Clear Time (g_c+I1), s | 2.9 | 22.4 | | 3.3 | | 10.3 |
| Green Ext Time (p_c), s | 0.1 | 24.0 | | 0.0 | | 20.7 |

Intersection Summary

HCM 6th Ctrl Delay 5.2
HCM 6th LOS A

Notes

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

| | → | ↘ | ↙ | ← | ↓ | ↗ |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Configurations | ↑↑↑ | ↑ | ↘↙ | ↑↑↑ | ↑ | ↗ |
| Traffic Volume (vph) | 2695 | 330 | 325 | 1865 | 5 | 355 |
| Future Volume (vph) | 2695 | 330 | 325 | 1865 | 5 | 355 |
| Turn Type | NA | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 3 | 8 | 6 | |
| Permitted Phases | | 4 | 8 | | | 6 |
| Detector Phase | 4 | 4 | 3 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.0 | 25.0 | 12.5 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 61.0 | 61.0 | 14.0 | 75.0 | 35.0 | 35.0 |
| Total Split (%) | 55.5% | 55.5% | 12.7% | 68.2% | 31.8% | 31.8% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Max | C-Max | None | C-Max | None | None |

Intersection Summary

Cycle Length: 110

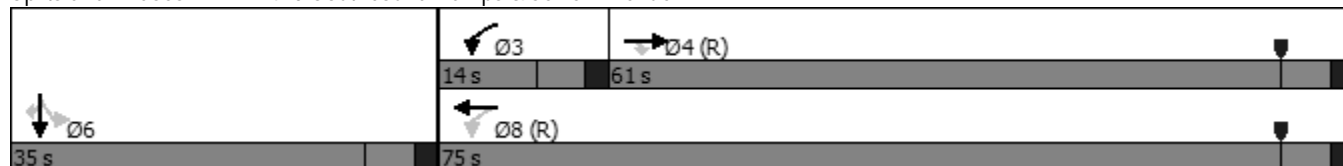
Actuated Cycle Length: 110







Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 1: E-470 Southbound Ramps & Jewell Avenue















| |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Group Flow (vph) | 2750 | 337 | 332 | 1903 | 245 | 362 |
| v/c Ratio | 1.02 | 0.35 | 0.82 | 0.56 | 0.63 | 0.87 |
| Control Delay | 50.4 | 4.2 | 49.2 | 6.5 | 45.4 | 52.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Total Delay | 50.4 | 4.2 | 49.2 | 6.6 | 45.4 | 52.2 |
| Queue Length 50th (ft) | ~797 | 18 | 96 | 100 | 152 | 186 |
| Queue Length 95th (ft) | #889 | 67 | m#121 | 165 | 232 | #324 |
| Internal Link Dist (ft) | 679 | | | 530 | 532 | |
| Turn Bay Length (ft) | | 300 | 250 | | | |
| Base Capacity (vph) | 2689 | 971 | 406 | 3375 | 450 | 467 |
| Starvation Cap Reductn | 0 | 0 | 0 | 220 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.02 | 0.35 | 0.82 | 0.60 | 0.54 | 0.78 |
| Intersection Summary | | | | | | |
| ~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. | | | | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. | | | | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | | | | |

HCM 6th Signalized Intersection Summary

1: E-470 Southbound Ramps & Jewell Avenue



















11/22/2023

2050 Background - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↑↑↑ | ↗ | ↘↗ | ↑↑↑ | | | | | | ↖ | ↗ |
| Traffic Volume (veh/h) | 0 | 2695 | 330 | 325 | 1865 | 0 | 0 | 0 | 0 | 235 | 5 | 355 |
| Future Volume (veh/h) | 0 | 2695 | 330 | 325 | 1865 | 0 | 0 | 0 | 0 | 235 | 5 | 355 |
| Initial Q (Qb), veh | 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 |
| Parking Bus, Adj | 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 | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 1870 | 1870 | 0 | | | | 1811 | 1811 | 1811 |
| Adj Flow Rate, veh/h | 0 | 2750 | 337 | 332 | 1903 | 0 | | | | 240 | 5 | 0 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | | | | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 0 | | | | 6 | 6 | 6 |
| Cap, veh/h | 0 | 3078 | 956 | 385 | 3703 | 0 | | | | 280 | 6 | |
| Arrive On Green | 0.00 | 0.60 | 0.60 | 0.14 | 1.00 | 0.00 | | | | 0.17 | 0.17 | 0.00 |
| Sat Flow, veh/h | 0 | 5274 | 1585 | 3456 | 5274 | 0 | | | | 1691 | 35 | 1535 |
| Grp Volume(v), veh/h | 0 | 2750 | 337 | 332 | 1903 | 0 | | | | 245 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1702 | 1585 | 1728 | 1702 | 0 | | | | 1727 | 0 | 1535 |
| Q Serve(g_s), s | 0.0 | 51.0 | 11.8 | 5.4 | 0.0 | 0.0 | | | | 15.2 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 51.0 | 11.8 | 5.4 | 0.0 | 0.0 | | | | 15.2 | 0.0 | 0.0 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 0.00 | | | | 0.98 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 3078 | 956 | 385 | 3703 | 0 | | | | 286 | 0 | |
| V/C Ratio(X) | 0.00 | 0.89 | 0.35 | 0.86 | 0.51 | 0.00 | | | | 0.86 | 0.00 | |
| Avail Cap(c_a), veh/h | 0 | 3078 | 956 | 402 | 3703 | 0 | | | | 455 | 0 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(l) | 0.00 | 1.00 | 1.00 | 0.34 | 0.34 | 0.00 | | | | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 18.8 | 11.0 | 29.5 | 0.0 | 0.0 | | | | 44.6 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 4.5 | 1.0 | 6.6 | 0.2 | 0.0 | | | | 9.1 | 0.0 | 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 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 18.3 | 3.9 | 4.3 | 0.1 | 0.0 | | | | 7.2 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 23.3 | 12.0 | 36.0 | 0.2 | 0.0 | | | | 53.7 | 0.0 | 0.0 |
| LnGrp LOS | A | C | B | D | A | A | | | | D | A | |
| Approach Vol, veh/h | | 3087 | | | 2235 | | | | | | 245 | |
| Approach Delay, s/veh | | 22.1 | | | 5.5 | | | | | | 53.7 | |
| Approach LOS | | C | | | A | | | | | | D | |
| Timer - Assigned Phs | | | 3 | 4 | | 6 | | | 8 | | | |
| Phs Duration (G+Y+Rc), s | | | 13.5 | 72.3 | | 24.2 | | | 85.8 | | | |
| Change Period (Y+Rc), s | | | 6.0 | 6.0 | | 6.0 | | | 6.0 | | | |
| Max Green Setting (Gmax), s | | | 8.0 | 55.0 | | 29.0 | | | 69.0 | | | |
| Max Q Clear Time (g_c+I1), s | | | 7.4 | 53.0 | | 17.2 | | | 2.0 | | | |
| Green Ext Time (p_c), s | | | 0.1 | 2.0 | | 1.1 | | | 23.9 | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 16.8 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

Notes

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

| |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
| Lane Configurations |   |    |    |  |   |  |
| Traffic Volume (vph) | 275 | 2655 | 1915 | 310 | 0 | 370 |
| Future Volume (vph) | 275 | 2655 | 1915 | 310 | 0 | 370 |
| Turn Type | pm+pt | NA | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 8 | | 2 | |
| Permitted Phases | 4 | | | 8 | | 2 |
| Detector Phase | 7 | 4 | 8 | 8 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 3.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.5 | 25.0 | 25.0 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 13.0 | 69.0 | 56.0 | 56.0 | 41.0 | 41.0 |
| Total Split (%) | 11.8% | 62.7% | 50.9% | 50.9% | 37.3% | 37.3% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Recall Mode | None | C-Max | C-Max | C-Max | Max | Max |

Intersection Summary

Cycle Length: 110





Actuated Cycle Length: 110

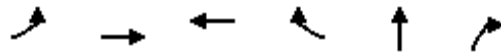
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 2: E-470 Northbound Ramps & Jewell Avenue

| | |
|---|---|
|  Ø2 |  Ø4 (R) |
| 41 s | 69 s |
| |  Ø7 |
| |  Ø8 (R) |
| | 13 s |
| | 56 s |



| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
|-------------------------|------|------|------|------|------|------|
| Lane Group Flow (vph) | 281 | 2709 | 1954 | 316 | 281 | 378 |
| v/c Ratio | 0.82 | 0.95 | 0.89 | 0.37 | 0.51 | 0.69 |
| Control Delay | 42.5 | 14.1 | 33.6 | 4.2 | 34.6 | 32.1 |
| Queue Delay | 0.0 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.5 | 15.6 | 33.6 | 4.2 | 34.6 | 32.1 |
| Queue Length 50th (ft) | 69 | 177 | 450 | 10 | 161 | 179 |
| Queue Length 95th (ft) | m71 | m174 | 523 | 60 | 246 | 292 |
| Internal Link Dist (ft) | | 530 | 2523 | | 717 | |
| Turn Bay Length (ft) | 250 | | | | | 175 |
| Base Capacity (vph) | 342 | 2856 | 2203 | 844 | 546 | 550 |
| Starvation Cap Reductn | 0 | 60 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.82 | 0.97 | 0.89 | 0.37 | 0.51 | 0.69 |

Intersection Summary



















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

HCM 6th Signalized Intersection Summary

2: E-470 Northbound Ramps & Jewell Avenue

11/22/2023

2050 Background - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | | |  |  | |  |  | | | |
| Traffic Volume (veh/h) | 275 | 2655 | 0 | 0 | 1915 | 310 | 275 | 0 | 370 | 0 | 0 | 0 |
| Future Volume (veh/h) | 275 | 2655 | 0 | 0 | 1915 | 310 | 275 | 0 | 370 | 0 | 0 | 0 |
| Initial Q (Qb), veh | 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 | | | |
| Parking Bus, Adj | 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 | | | | | |
| Adj Sat Flow, veh/h/ln | 1841 | 1841 | 0 | 0 | 1796 | 1796 | 1826 | 1826 | 1826 | | | |
| Adj Flow Rate, veh/h | 281 | 2709 | 0 | 0 | 1954 | 316 | 281 | 0 | 0 | | | |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | | | |
| Percent Heavy Veh, % | 4 | 4 | 0 | 0 | 7 | 7 | 5 | 5 | 5 | | | |
| Cap, veh/h | 370 | 2878 | 0 | 0 | 2240 | 695 | 553 | 0 | | | | |
| Arrive On Green | 0.12 | 1.00 | 0.00 | 0.00 | 0.46 | 0.46 | 0.32 | 0.00 | 0.00 | | | |
| Sat Flow, veh/h | 3401 | 5191 | 0 | 0 | 5065 | 1522 | 1739 | 0 | 1547 | | | |
| Grp Volume(v), veh/h | 281 | 2709 | 0 | 0 | 1954 | 316 | 281 | 0 | 0 | | | |
| Grp Sat Flow(s),veh/h/ln | 1700 | 1675 | 0 | 0 | 1635 | 1522 | 1739 | 0 | 1547 | | | |
| Q Serve(g_s), s | 4.7 | 0.0 | 0.0 | 0.0 | 39.6 | 15.7 | 14.5 | 0.0 | 0.0 | | | |
| Cycle Q Clear(g_c), s | 4.7 | 0.0 | 0.0 | 0.0 | 39.6 | 15.7 | 14.5 | 0.0 | 0.0 | | | |
| Prop In Lane | 1.00 | | 0.00 | 0.00 | | 1.00 | 1.00 | | 1.00 | | | |
| Lane Grp Cap(c), veh/h | 370 | 2878 | 0 | 0 | 2240 | 695 | 553 | 0 | | | | |
| V/C Ratio(X) | 0.76 | 0.94 | 0.00 | 0.00 | 0.87 | 0.45 | 0.51 | 0.00 | | | | |
| Avail Cap(c_a), veh/h | 378 | 2878 | 0 | 0 | 2240 | 695 | 553 | 0 | | | | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | |
| Upstream Filter(I) | 0.09 | 0.09 | 0.00 | 0.00 | 0.17 | 0.17 | 1.00 | 0.00 | 0.00 | | | |
| Uniform Delay (d), s/veh | 23.1 | 0.0 | 0.0 | 0.0 | 27.0 | 20.5 | 30.5 | 0.0 | 0.0 | | | |
| Incr Delay (d2), s/veh | 0.8 | 0.9 | 0.0 | 0.0 | 0.9 | 0.4 | 3.3 | 0.0 | 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 | | | |
| %ile BackOfQ(50%),veh/ln | 1.5 | 0.2 | 0.0 | 0.0 | 14.3 | 5.3 | 6.5 | 0.0 | 0.0 | | | |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 23.9 | 0.9 | 0.0 | 0.0 | 27.9 | 20.8 | 33.8 | 0.0 | 0.0 | | | |
| LnGrp LOS | C | A | A | A | C | C | C | A | | | | |
| Approach Vol, veh/h | 2990 | | | 2270 | | | 281 | | | | | |
| Approach Delay, s/veh | 3.0 | | | 26.9 | | | 33.8 | | | | | |
| Approach LOS | A | | | C | | | C | | | | | |
| Timer - Assigned Phs | 2 | | | 4 | | | 7 | | | 8 | | |
| Phs Duration (G+Y+Rc), s | 41.0 | | | 69.0 | | | 12.7 | | | 56.3 | | |
| Change Period (Y+Rc), s | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | | |
| Max Green Setting (Gmax), s | 35.0 | | | 63.0 | | | 7.0 | | | 50.0 | | |
| Max Q Clear Time (g_c+I1), s | 16.5 | | | 2.0 | | | 6.7 | | | 41.6 | | |
| Green Ext Time (p_c), s | 1.6 | | | 43.5 | | | 0.0 | | | 7.1 | | |

Intersection Summary

HCM 6th Ctrl Delay 14.4

HCM 6th LOS B

























Notes

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

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

Timings
11/22/2023

3: Gun Club Road & Jewell Avenue
2050 Background - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 495 | 2205 | 325 | 470 | 1705 | 470 | 270 | 1315 | 495 | 505 | 1545 | 250 |
| Future Volume (vph) | 495 | 2205 | 325 | 470 | 1705 | 470 | 270 | 1315 | 495 | 505 | 1545 | 250 |
| Turn Type | Prot | NA | Free | Prot | NA | pm+ov | Prot | NA | Free | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | 7 |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 4.0 | | 3.0 | 5.0 | 4.0 | 4.0 | 8.0 | | 4.0 | 8.0 | 3.0 |
| Minimum Split (s) | 9.5 | 32.0 | | 9.5 | 32.0 | 9.5 | 9.5 | 40.0 | | 9.5 | 29.0 | 9.5 |
| Total Split (s) | 26.8 | 64.0 | | 16.0 | 53.2 | 22.0 | 21.0 | 48.0 | | 22.0 | 49.0 | 26.8 |
| Total Split (%) | 17.9% | 42.7% | | 10.7% | 35.5% | 14.7% | 14.0% | 32.0% | | 14.7% | 32.7% | 17.9% |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 6.0 | | 5.0 | 6.0 | 5.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lead | Lag | | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | C-Max | | None | C-Max | None |

Intersection Summary

Cycle Length: 150









Actuated Cycle Length: 150













Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 145

Control Type: Actuated-Coordinated

Splits and Phases: 3: Gun Club Road & Jewell Avenue

| | | | |
|--|--|--|--|
|  Ø1 |  Ø2 (R) |  Ø3 |  Ø4 |
| 22 s | 48 s | 16 s | 64 s |
|  Ø5 |  Ø6 (R) |  Ø7 |  Ø8 |
| 21 s | 49 s | 26.8 s | 53.2 s |

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 505 | 2250 | 332 | 480 | 1740 | 480 | 276 | 1342 | 505 | 515 | 1577 | 255 |
| v/c Ratio | 1.03 | 1.15 | 0.21 | 1.95 | 1.09 | 0.62 | 0.82 | 0.99 | 0.33 | 1.31 | 1.06 | 0.32 |
| Control Delay | 110.5 | 114.1 | 0.3 | 475.8 | 97.1 | 27.5 | 84.9 | 75.2 | 0.6 | 207.7 | 91.0 | 20.6 |
| 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 | 110.5 | 114.1 | 0.3 | 475.8 | 97.1 | 27.5 | 84.9 | 75.2 | 0.6 | 207.7 | 91.0 | 20.6 |
| Queue Length 50th (ft) | ~272 | ~942 | 0 | ~372 | ~697 | 280 | 138 | 481 | 0 | ~332 | ~624 | 121 |
| Queue Length 95th (ft) | #389 | #1031 | 0 | #488 | #792 | 404 | #203 | #590 | 0 | #451 | #721 | 189 |
| Internal Link Dist (ft) | | 2523 | | | 1479 | | | 1470 | | | 790 | |
| Turn Bay Length (ft) | 420 | | 330 | 300 | | 565 | 485 | | 300 | 200 | | 325 |
| Base Capacity (vph) | 489 | 1961 | 1553 | 246 | 1602 | 777 | 349 | 1357 | 1509 | 392 | 1489 | 786 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.03 | 1.15 | 0.21 | 1.95 | 1.09 | 0.62 | 0.79 | 0.99 | 0.33 | 1.31 | 1.06 | 0.32 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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
























Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary

11/22/2023

3: Gun Club Road & Jewell Avenue

2050 Background - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  | |
| Traffic Volume (veh/h) | 495 | 2205 | 325 | 470 | 1705 | 470 | 270 | 1315 | 495 | 505 | 1545 | 250 |
| Future Volume (veh/h) | 495 | 2205 | 325 | 470 | 1705 | 470 | 270 | 1315 | 495 | 505 | 1545 | 250 |
| 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 | 1841 | 1841 | 1841 | 1841 | 1841 | 1841 | 1796 | 1796 | 1796 | 1885 | 1885 | 1885 |
| Adj Flow Rate, veh/h | 505 | 2250 | 0 | 480 | 1740 | 480 | 276 | 1342 | 0 | 515 | 1577 | 255 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 1 | 1 | 1 |
| Cap, veh/h | 494 | 1977 | | 249 | 1615 | 678 | 320 | 1373 | | 395 | 1528 | 707 |
| Arrive On Green | 0.15 | 0.39 | 0.00 | 0.07 | 0.32 | 0.32 | 0.10 | 0.28 | 0.00 | 0.11 | 0.30 | 0.30 |
| Sat Flow, veh/h | 3401 | 5025 | 1560 | 3401 | 5025 | 1560 | 3319 | 4904 | 1522 | 3483 | 5147 | 1598 |
| Grp Volume(v), veh/h | 505 | 2250 | 0 | 480 | 1740 | 480 | 276 | 1342 | 0 | 515 | 1577 | 255 |
| Grp Sat Flow(s),veh/h/ln | 1700 | 1675 | 1560 | 1700 | 1675 | 1560 | 1659 | 1635 | 1522 | 1742 | 1716 | 1598 |
| Q Serve(g_s), s | 21.8 | 59.0 | 0.0 | 11.0 | 48.2 | 37.7 | 12.3 | 40.7 | 0.0 | 17.0 | 44.5 | 15.9 |
| Cycle Q Clear(g_c), s | 21.8 | 59.0 | 0.0 | 11.0 | 48.2 | 37.7 | 12.3 | 40.7 | 0.0 | 17.0 | 44.5 | 15.9 |
| 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 | 494 | 1977 | | 249 | 1615 | 678 | 320 | 1373 | | 395 | 1528 | 707 |
| V/C Ratio(X) | 1.02 | 1.14 | | 1.92 | 1.08 | 0.71 | 0.86 | 0.98 | | 1.30 | 1.03 | 0.36 |
| Avail Cap(c_a), veh/h | 494 | 1977 | | 249 | 1615 | 678 | 354 | 1373 | | 395 | 1528 | 707 |
| 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) | 0.28 | 0.28 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 64.1 | 45.5 | 0.0 | 69.5 | 50.9 | 34.6 | 66.8 | 53.5 | 0.0 | 66.5 | 52.7 | 27.8 |
| Incr Delay (d2), s/veh | 27.1 | 64.3 | 0.0 | 430.6 | 46.5 | 3.4 | 18.0 | 19.5 | 0.0 | 154.4 | 31.6 | 1.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.1 | 35.3 | 0.0 | 19.6 | 26.6 | 14.5 | 5.9 | 18.5 | 0.0 | 15.8 | 22.8 | 6.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 91.2 | 109.8 | 0.0 | 500.1 | 97.4 | 38.0 | 84.8 | 73.0 | 0.0 | 220.9 | 84.4 | 29.2 |
| LnGrp LOS | F | F | | F | F | D | F | E | | F | F | C |
| Approach Vol, veh/h | 2755 | | | | 2700 | | | | 1618 | | 2347 | |
| Approach Delay, s/veh | 106.4 | | | | 158.4 | | | | 75.0 | | 108.3 | |
| Approach LOS | F | | | | F | | | | E | | F | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 22.0 | 48.0 | 16.0 | 64.0 | 19.5 | 50.5 | 26.8 | 53.2 | | | | |
| 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 | 17.0 | 42.0 | 11.0 | 59.0 | 16.0 | 43.0 | 21.8 | 48.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 19.0 | 42.7 | 13.0 | 61.0 | 14.3 | 46.5 | 23.8 | 50.2 | | | | |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | | | | |

Intersection Summary

| | |
|--------------------|-------|
| HCM 6th Ctrl Delay | 116.4 |
| HCM 6th LOS | F |

Notes

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

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

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0.1 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | ↗ | ↘ | ↑↑↑ | ↑↑↑ | ↗ |
| Traffic Vol, veh/h | 0 | 20 | 5 | 2025 | 2285 | 15 |
| Future Vol, veh/h | 0 | 20 | 5 | 2025 | 2285 | 15 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | 250 | - | - | 250 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 98 | 98 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 22 | 5 | 2066 | 2332 | 16 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - 1166 | 2348 | 0 - 0 |
| Stage 1 | - | - | - - - |
| Stage 2 | - | - | - - - |
| Critical Hdwy | - 7.14 | 5.34 | - - - |
| Critical Hdwy Stg 1 | - | - | - - - |
| Critical Hdwy Stg 2 | - | - | - - - |
| Follow-up Hdwy | - 3.92 | 3.12 | - - - |
| Pot Cap-1 Maneuver | 0 *399 | *501 | - - - |
| Stage 1 | 0 | - | - - - |
| Stage 2 | 0 | - | - - - |
| Platoon blocked, % | 1 | 1 | - - - |
| Mov Cap-1 Maneuver | - *399 | *501 | - - - |
| Mov Cap-2 Maneuver | - | - | - - - |
| Stage 1 | - | - | - - - |
| Stage 2 | - | - | - - - |





















| Approach | EB | NB | SB |
|----------------------|------|----|----|
| HCM Control Delay, s | 14.5 | 0 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h) | * 501 | - | 399 | - | - |
| HCM Lane V/C Ratio | 0.011 | - | 0.054 | - | - |
| HCM Control Delay (s) | 12.3 | - | 14.5 | - | - |
| HCM Lane LOS | B | - | B | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.2 | - | - |

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

Timings
11/22/2023

102: Gun Club Road & Yale Avenue
2050 Background - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 305 | 5 | 460 | 5 | 15 | 1405 | 325 | 450 | 1835 | 20 |
| Future Volume (vph) | 305 | 5 | 460 | 5 | 15 | 1405 | 325 | 450 | 1835 | 20 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 33.0 | 11.0 | 33.0 | 11.0 | 30.0 | 30.0 | 11.0 | 30.0 | 30.0 |
| Total Split (s) | 21.0 | 37.0 | 17.0 | 33.0 | 11.0 | 46.0 | 46.0 | 20.0 | 55.0 | 55.0 |
| Total Split (%) | 17.5% | 30.8% | 14.2% | 27.5% | 9.2% | 38.3% | 38.3% | 16.7% | 45.8% | 45.8% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | Max | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120






Actuated Cycle Length: 120











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

Natural Cycle: 105

Control Type: Actuated-Coordinated

Splits and Phases: 102: Gun Club Road & Yale Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 20 s | 46 s | 17 s | 37 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 11 s | 55 s | 21 s | 33 s |

| |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 332 | 76 | 500 | 353 | 16 | 1434 | 353 | 489 | 1872 | 22 |
| v/c Ratio | 1.03 | 0.19 | 0.54 | 0.72 | 0.12 | 0.85 | 0.47 | 0.93 | 0.79 | 0.03 |
| Control Delay | 91.1 | 10.1 | 29.7 | 31.1 | 18.1 | 42.9 | 6.2 | 56.3 | 31.4 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 91.1 | 10.1 | 29.7 | 31.1 | 18.1 | 42.9 | 6.2 | 56.3 | 31.4 | 0.1 |
| Queue Length 50th (ft) | 188 | 3 | 138 | 132 | 6 | 376 | 10 | 142 | 406 | 0 |
| Queue Length 95th (ft) | #333 | 42 | 182 | 246 | 18 | 438 | 81 | #244 | 561 | 0 |
| Internal Link Dist (ft) | | 816 | | 845 | | 4562 | | | 1641 | |
| Turn Bay Length (ft) | 150 | | | | 250 | | 250 | 250 | | 250 |
| Base Capacity (vph) | 322 | 466 | 931 | 489 | 137 | 1695 | 749 | 523 | 2356 | 806 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.03 | 0.16 | 0.54 | 0.72 | 0.12 | 0.85 | 0.47 | 0.93 | 0.79 | 0.03 |























Intersection Summary

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

HCM 6th Signalized Intersection Summary

102: Gun Club Road & Yale Avenue

2050 Background - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  | |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 305 | 5 | 65 | 460 | 5 | 320 | 15 | 1405 | 325 | 450 | 1835 | 20 |
| Future Volume (veh/h) | 305 | 5 | 65 | 460 | 5 | 320 | 15 | 1405 | 325 | 450 | 1835 | 20 |
| 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 | 332 | 5 | 0 | 500 | 5 | 0 | 16 | 1434 | 353 | 489 | 1872 | 22 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.98 | 0.92 | 0.92 | 0.98 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 597 | 483 | | 1053 | 421 | | 116 | 1734 | 538 | 543 | 2210 | 686 |
| Arrive On Green | 0.13 | 0.26 | 0.00 | 0.09 | 0.22 | 0.00 | 0.02 | 0.34 | 0.34 | 0.11 | 0.43 | 0.43 |
| Sat Flow, veh/h | 1781 | 1870 | 0 | 3456 | 1870 | 0 | 1781 | 5106 | 1585 | 3456 | 5106 | 1585 |
| Grp Volume(v), veh/h | 332 | 5 | 0 | 500 | 5 | 0 | 16 | 1434 | 353 | 489 | 1872 | 22 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1870 | 0 | 1728 | 1870 | 0 | 1781 | 1702 | 1585 | 1728 | 1702 | 1585 |
| Q Serve(g_s), s | 15.0 | 0.2 | 0.0 | 11.0 | 0.2 | 0.0 | 0.7 | 30.9 | 22.7 | 11.0 | 39.4 | 1.0 |
| Cycle Q Clear(g_c), s | 15.0 | 0.2 | 0.0 | 11.0 | 0.2 | 0.0 | 0.7 | 30.9 | 22.7 | 11.0 | 39.4 | 1.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 597 | 483 | | 1053 | 421 | | 116 | 1734 | 538 | 543 | 2210 | 686 |
| V/C Ratio(X) | 0.56 | 0.01 | | 0.47 | 0.01 | | 0.14 | 0.83 | 0.66 | 0.90 | 0.85 | 0.03 |
| Avail Cap(c_a), veh/h | 597 | 483 | | 1053 | 421 | | 159 | 1734 | 538 | 565 | 2210 | 686 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.2 | 33.1 | 0.0 | 32.8 | 36.1 | 0.0 | 28.6 | 36.4 | 33.7 | 28.9 | 30.5 | 19.6 |
| Incr Delay (d2), s/veh | 1.1 | 0.0 | 0.0 | 0.3 | 0.1 | 0.0 | 0.5 | 4.7 | 6.1 | 17.0 | 4.3 | 0.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.9 | 0.1 | 0.0 | 5.9 | 0.1 | 0.0 | 0.3 | 12.7 | 9.6 | 5.4 | 15.6 | 0.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 32.4 | 33.1 | 0.0 | 33.2 | 36.2 | 0.0 | 29.1 | 41.1 | 39.8 | 46.0 | 34.7 | 19.7 |
| LnGrp LOS | C | C | | C | D | | C | D | D | D | C | B |
| Approach Vol, veh/h | | 337 | | | 505 | | | 1803 | | | 2383 | |
| Approach Delay, s/veh | | 32.4 | | | 33.2 | | | 40.7 | | | 36.9 | |
| Approach LOS | | C | | | C | | | D | | | D | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 19.2 | 46.8 | 17.0 | 37.0 | 8.1 | 57.9 | 21.0 | 33.0 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 14.0 | 40.0 | 11.0 | 31.0 | 5.0 | 49.0 | 15.0 | 27.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 13.0 | 32.9 | 13.0 | 2.2 | 2.7 | 41.4 | 17.0 | 2.2 | | | | |
| Green Ext Time (p_c), s | 0.2 | 5.0 | 0.0 | 0.0 | 0.0 | 5.9 | 0.0 | 0.0 | | | | |













Intersection Summary

HCM 6th Ctrl Delay 37.6

HCM 6th LOS D

Notes

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

| |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations |  |  |  |  |  |  |
| Traffic Volume (vph) | 90 | 105 | 1975 | 50 | 130 | 2210 |
| Future Volume (vph) | 90 | 105 | 1975 | 50 | 130 | 2210 |
| Turn Type | Prot | Free | NA | Perm | pm+pt | NA |
| Protected Phases | 7 | | 2 | | 1 | 6 |
| Permitted Phases | | Free | | 2 | 6 | |
| Detector Phase | 7 | | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 11.0 | | 28.0 | 28.0 | 11.0 | 28.0 |
| Total Split (s) | 16.0 | | 58.0 | 58.0 | 16.0 | 74.0 |
| Total Split (%) | 17.8% | | 64.4% | 64.4% | 17.8% | 82.2% |
| Yellow Time (s) | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | |
| Recall Mode | None | | C-Max | C-Max | None | C-Max |

Intersection Summary

Cycle Length: 90

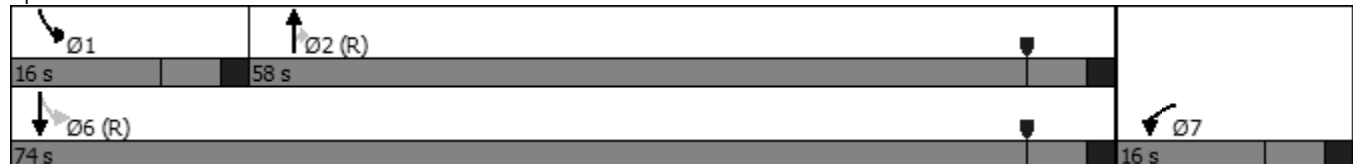
Actuated Cycle Length: 90







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

Natural Cycle: 55

Control Type: Actuated-Coordinated













Splits and Phases: 103: Gun Club Road & Addison Avenue



| |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Group Flow (vph) | 98 | 114 | 2015 | 54 | 141 | 2255 |
| v/c Ratio | 0.56 | 0.07 | 0.62 | 0.05 | 0.59 | 0.55 |
| Control Delay | 50.8 | 0.1 | 12.0 | 2.6 | 23.1 | 4.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 50.8 | 0.1 | 12.0 | 2.6 | 23.1 | 4.6 |
| Queue Length 50th (ft) | 53 | 0 | 253 | 0 | 27 | 164 |
| Queue Length 95th (ft) | 104 | 0 | 324 | 15 | 87 | 196 |
| Internal Link Dist (ft) | 1036 | | 985 | | | 915 |
| Turn Bay Length (ft) | | | | 300 | 300 | |
| Base Capacity (vph) | 196 | 1583 | 3247 | 1030 | 278 | 4106 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.50 | 0.07 | 0.62 | 0.05 | 0.51 | 0.55 |
| Intersection Summary | | | | | | |

HCM 6th Signalized Intersection Summary
11/22/2023

103: Gun Club Road & Addison Avenue
2050 Background - PM Peak Hour

| |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 90 | 105 | 1975 | 50 | 130 | 2210 |
| Future Volume (veh/h) | 90 | 105 | 1975 | 50 | 130 | 2210 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | No | | | No |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 98 | 0 | 2015 | 54 | 141 | 2255 |
| Peak Hour Factor | 0.92 | 0.92 | 0.98 | 0.92 | 0.92 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 125 | | 3451 | 1071 | 269 | 4066 |
| Arrive On Green | 0.07 | 0.00 | 0.68 | 0.68 | 0.05 | 0.80 |
| Sat Flow, veh/h | 1781 | 1585 | 5274 | 1585 | 1781 | 5274 |
| Grp Volume(v), veh/h | 98 | 0 | 2015 | 54 | 141 | 2255 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1585 | 1702 | 1585 | 1781 | 1702 |
| Q Serve(g_s), s | 4.9 | 0.0 | 19.0 | 1.0 | 1.9 | 14.5 |
| Cycle Q Clear(g_c), s | 4.9 | 0.0 | 19.0 | 1.0 | 1.9 | 14.5 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 125 | | 3451 | 1071 | 269 | 4066 |
| V/C Ratio(X) | 0.78 | | 0.58 | 0.05 | 0.52 | 0.55 |
| Avail Cap(c_a), veh/h | 198 | | 3451 | 1071 | 371 | 4066 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 41.2 | 0.0 | 7.8 | 4.9 | 11.1 | 3.3 |
| Incr Delay (d2), s/veh | 10.1 | 0.0 | 0.7 | 0.1 | 1.6 | 0.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.5 | 0.0 | 4.8 | 0.3 | 1.0 | 1.7 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d),s/veh | 51.3 | 0.0 | 8.5 | 5.0 | 12.7 | 3.9 |
| LnGrp LOS | D | | A | A | B | A |
| Approach Vol, veh/h | 98 | | 2069 | | | 2396 |
| Approach Delay, s/veh | 51.3 | | 8.5 | | | 4.4 |
| Approach LOS | D | | A | | | A |
| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
| Phs Duration (G+Y+Rc), s | 10.9 | 66.8 | | 12.3 | | 77.7 |
| Change Period (Y+Rc), s | 6.0 | 6.0 | | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | 10.0 | 52.0 | | 10.0 | | 68.0 |
| Max Q Clear Time (g_c+I1), s | 3.9 | 21.0 | | 6.9 | | 16.5 |
| Green Ext Time (p_c), s | 0.2 | 17.9 | | 0.1 | | 27.5 |

Intersection Summary

| | |
|--------------------|-----|
| HCM 6th Ctrl Delay | 7.2 |
| HCM 6th LOS | A |

Notes

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

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

***Intersection Capacity Worksheets:
2027 Background
+ Project***

| | → | ↘ | ↙ | ← | ↓ | ↗ |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Configurations | ↑ | ↗ | ↙ | ↑ | ↖ | ↗ |
| Traffic Volume (vph) | 706 | 180 | 150 | 816 | 1 | 190 |
| Future Volume (vph) | 706 | 180 | 150 | 816 | 1 | 190 |
| Turn Type | NA | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 3 | 8 | 6 | |
| Permitted Phases | | 4 | 8 | | | 6 |
| Detector Phase | 4 | 4 | 3 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.0 | 25.0 | 10.0 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 50.0 | 50.0 | 13.0 | 63.0 | 27.0 | 27.0 |
| Total Split (%) | 55.6% | 55.6% | 14.4% | 70.0% | 30.0% | 30.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Max | C-Max | None | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90

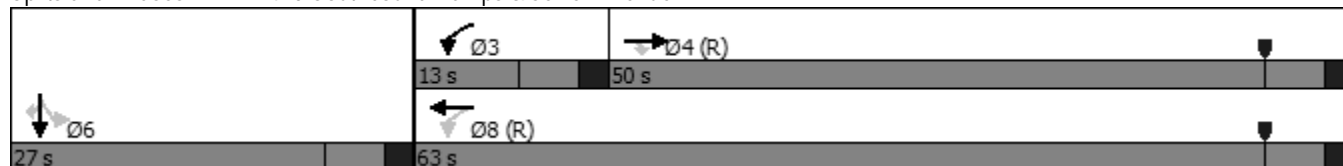
Actuated Cycle Length: 90







Offset: 68 (76%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 1: E-470 Southbound Ramps & Jewell Avenue















| |  |  |  |  |  |  |
|-----------------------------|---|---|---|---|---|---|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Group Flow (vph) | 743 | 189 | 169 | 917 | 260 | 218 |
| v/c Ratio | 0.82 | 0.22 | 0.60 | 0.77 | 0.72 | 0.49 |
| Control Delay | 29.2 | 2.7 | 19.1 | 8.0 | 44.7 | 13.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 |
| Total Delay | 29.2 | 2.7 | 19.1 | 8.5 | 44.7 | 13.1 |
| Queue Length 50th (ft) | 346 | 0 | 32 | 127 | 137 | 25 |
| Queue Length 95th (ft) | #565 | 33 | m45 | m136 | #229 | 83 |
| Internal Link Dist (ft) | 679 | | | 530 | 532 | |
| Turn Bay Length (ft) | | 300 | 250 | | | |
| Base Capacity (vph) | 903 | 864 | 281 | 1191 | 361 | 446 |
| Starvation Cap Reductn | 0 | 0 | 0 | 64 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.82 | 0.22 | 0.60 | 0.81 | 0.72 | 0.49 |
| Intersection Summary | | | | | | |
| # | 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. | | | | | |
| m | Volume for 95th percentile queue is metered by upstream signal. | | | | | |













HCM 6th Signalized Intersection Summary

11/22/2023

1: E-470 Southbound Ramps & Jewell Avenue

2027 Bkgrd + Proj - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↑ | ↗ | ↖ | ↑ | | | | | | ↖ | ↗ |
| Traffic Volume (veh/h) | 0 | 706 | 180 | 150 | 816 | 0 | 0 | 0 | 0 | 225 | 1 | 190 |
| Future Volume (veh/h) | 0 | 706 | 180 | 150 | 816 | 0 | 0 | 0 | 0 | 225 | 1 | 190 |
| Initial Q (Qb), veh | 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 |
| Parking Bus, Adj | 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 | |
| Adj Sat Flow, veh/h/ln | 0 | 1856 | 1856 | 1885 | 1885 | 0 | | | | 1648 | 1841 | 1648 |
| Adj Flow Rate, veh/h | 0 | 743 | 189 | 169 | 917 | 0 | | | | 259 | 1 | 218 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.89 | 0.89 | 0.89 | | | | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 1 | 1 | 0 | | | | 17 | 4 | 17 |
| Cap, veh/h | 0 | 929 | 787 | 300 | 1194 | 0 | | | | 408 | 2 | 326 |
| Arrive On Green | 0.00 | 0.50 | 0.50 | 0.13 | 1.00 | 0.00 | | | | 0.23 | 0.23 | 0.23 |
| Sat Flow, veh/h | 0 | 1856 | 1572 | 1795 | 1885 | 0 | | | | 1747 | 7 | 1397 |
| Grp Volume(v), veh/h | 0 | 743 | 189 | 169 | 917 | 0 | | | | 260 | 0 | 218 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1856 | 1572 | 1795 | 1885 | 0 | | | | 1753 | 0 | 1397 |
| Q Serve(g_s), s | 0.0 | 30.0 | 6.1 | 4.0 | 0.0 | 0.0 | | | | 12.0 | 0.0 | 12.8 |
| Cycle Q Clear(g_c), s | 0.0 | 30.0 | 6.1 | 4.0 | 0.0 | 0.0 | | | | 12.0 | 0.0 | 12.8 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 0.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 929 | 787 | 300 | 1194 | 0 | | | | 409 | 0 | 326 |
| V/C Ratio(X) | 0.00 | 0.80 | 0.24 | 0.56 | 0.77 | 0.00 | | | | 0.64 | 0.00 | 0.67 |
| Avail Cap(c_a), veh/h | 0 | 929 | 787 | 321 | 1194 | 0 | | | | 409 | 0 | 326 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(l) | 0.00 | 1.00 | 1.00 | 0.10 | 0.10 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 18.7 | 12.8 | 15.0 | 0.0 | 0.0 | | | | 31.1 | 0.0 | 31.3 |
| Incr Delay (d2), s/veh | 0.0 | 7.2 | 0.7 | 0.2 | 0.5 | 0.0 | | | | 7.3 | 0.0 | 10.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 12.9 | 2.1 | 1.2 | 0.2 | 0.0 | | | | 5.8 | 0.0 | 5.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 25.9 | 13.5 | 15.2 | 0.5 | 0.0 | | | | 38.4 | 0.0 | 41.8 |
| LnGrp LOS | A | C | B | B | A | A | | | | D | A | D |
| Approach Vol, veh/h | | 932 | | | 1086 | | | | | | 478 | |
| Approach Delay, s/veh | | 23.4 | | | 2.8 | | | | | | 39.9 | |
| Approach LOS | | C | | | A | | | | | | D | |
| Timer - Assigned Phs | | | 3 | 4 | | 6 | | | 8 | | | |
| Phs Duration (G+Y+Rc), s | | | 11.9 | 51.1 | | 27.0 | | | 63.0 | | | |
| Change Period (Y+Rc), s | | | 6.0 | 6.0 | | 6.0 | | | 6.0 | | | |
| Max Green Setting (Gmax), s | | | 7.0 | 44.0 | | 21.0 | | | 57.0 | | | |
| Max Q Clear Time (g_c+I1), s | | | 6.0 | 32.0 | | 14.8 | | | 2.0 | | | |
| Green Ext Time (p_c), s | | | 0.0 | 4.3 | | 1.3 | | | 8.1 | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 17.6 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

| |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
| Lane Configurations |  |  |  |  |  |  |
| Traffic Volume (vph) | 225 | 706 | 771 | 91 | 0 | 185 |
| Future Volume (vph) | 225 | 706 | 771 | 91 | 0 | 185 |
| Turn Type | pm+pt | NA | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 8 | | 2 | |
| Permitted Phases | 4 | | | 8 | | 2 |
| Detector Phase | 7 | 4 | 8 | 8 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 3.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.5 | 25.0 | 25.0 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 15.0 | 64.0 | 49.0 | 49.0 | 26.0 | 26.0 |
| Total Split (%) | 16.7% | 71.1% | 54.4% | 54.4% | 28.9% | 28.9% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Recall Mode | None | C-Max | C-Max | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90





Actuated Cycle Length: 90

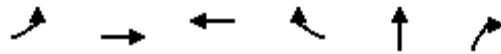
Offset: 60 (67%), Referenced to phase 4:EBTL and 8:WBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 2: E-470 Northbound Ramps & Jewell Avenue

| | | |
|--|--|--|
|  Ø2 |  Ø4 (R) | |
| 26 s | 64 s | |
| |  Ø7 |  Ø8 (R) |
| | 15 s | 49 s |



| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
|-------------------------|-------|------|------|------|------|------|
| Lane Group Flow (vph) | 237 | 743 | 876 | 103 | 224 | 213 |
| v/c Ratio | 0.94 | 0.64 | 0.99 | 0.13 | 0.58 | 0.41 |
| Control Delay | 59.3 | 11.5 | 54.1 | 2.9 | 38.0 | 7.0 |
| Queue Delay | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 59.3 | 11.8 | 54.1 | 2.9 | 38.0 | 7.0 |
| Queue Length 50th (ft) | 114 | 208 | 475 | 0 | 114 | 0 |
| Queue Length 95th (ft) | m#156 | m312 | #719 | 22 | 181 | 50 |
| Internal Link Dist (ft) | | 530 | 2523 | | 717 | |
| Turn Bay Length (ft) | 250 | | | 250 | | 175 |
| Base Capacity (vph) | 252 | 1166 | 881 | 806 | 389 | 514 |
| Starvation Cap Reductn | 0 | 79 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.94 | 0.68 | 0.99 | 0.13 | 0.58 | 0.41 |

Intersection Summary

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

Queue shown is maximum after two cycles.



















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

HCM 6th Signalized Intersection Summary

2: E-470 Northbound Ramps & Jewell Avenue

11/22/2023

2027 Bkgrd + Proj - AM Peak Hour

























| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | | |  |  | |  |  | | | |
| Traffic Volume (veh/h) | 225 | 706 | 0 | 0 | 771 | 91 | 195 | 0 | 185 | 0 | 0 | 0 |
| Future Volume (veh/h) | 225 | 706 | 0 | 0 | 771 | 91 | 195 | 0 | 185 | 0 | 0 | 0 |
| Initial Q (Qb), veh | 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 | | | |
| Parking Bus, Adj | 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 | | | | | |
| Adj Sat Flow, veh/h/ln | 1826 | 1826 | 0 | 0 | 1856 | 1856 | 1856 | 1856 | 1856 | | | |
| Adj Flow Rate, veh/h | 237 | 743 | 0 | 0 | 876 | 103 | 224 | 0 | 213 | | | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.88 | 0.88 | 0.88 | 0.87 | 0.87 | 0.87 | | | |
| Percent Heavy Veh, % | 5 | 5 | 0 | 0 | 3 | 3 | 3 | 3 | 3 | | | |
| Cap, veh/h | 260 | 1177 | 0 | 0 | 887 | 751 | 393 | 0 | 349 | | | |
| Arrive On Green | 0.20 | 1.00 | 0.00 | 0.00 | 0.48 | 0.48 | 0.22 | 0.00 | 0.22 | | | |
| Sat Flow, veh/h | 1739 | 1826 | 0 | 0 | 1856 | 1572 | 1767 | 0 | 1572 | | | |
| Grp Volume(v), veh/h | 237 | 743 | 0 | 0 | 876 | 103 | 224 | 0 | 213 | | | |
| Grp Sat Flow(s),veh/h/ln | 1739 | 1826 | 0 | 0 | 1856 | 1572 | 1767 | 0 | 1572 | | | |
| Q Serve(g_s), s | 7.4 | 0.0 | 0.0 | 0.0 | 42.0 | 3.3 | 10.2 | 0.0 | 11.0 | | | |
| Cycle Q Clear(g_c), s | 7.4 | 0.0 | 0.0 | 0.0 | 42.0 | 3.3 | 10.2 | 0.0 | 11.0 | | | |
| Prop In Lane | 1.00 | | 0.00 | 0.00 | | 1.00 | 1.00 | | 1.00 | | | |
| Lane Grp Cap(c), veh/h | 260 | 1177 | 0 | 0 | 887 | 751 | 393 | 0 | 349 | | | |
| V/C Ratio(X) | 0.91 | 0.63 | 0.00 | 0.00 | 0.99 | 0.14 | 0.57 | 0.00 | 0.61 | | | |
| Avail Cap(c_a), veh/h | 260 | 1177 | 0 | 0 | 887 | 751 | 393 | 0 | 349 | | | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | |
| Upstream Filter(I) | 0.46 | 0.46 | 0.00 | 0.00 | 0.59 | 0.59 | 1.00 | 0.00 | 1.00 | | | |
| Uniform Delay (d), s/veh | 20.9 | 0.0 | 0.0 | 0.0 | 23.2 | 13.1 | 31.2 | 0.0 | 31.5 | | | |
| Incr Delay (d2), s/veh | 19.1 | 1.2 | 0.0 | 0.0 | 20.6 | 0.2 | 5.9 | 0.0 | 7.7 | | | |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | |
| %ile BackOfQ(50%),veh/ln | 3.3 | 0.4 | 0.0 | 0.0 | 20.8 | 1.1 | 4.9 | 0.0 | 4.8 | | | |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 40.1 | 1.2 | 0.0 | 0.0 | 43.8 | 13.4 | 37.1 | 0.0 | 39.2 | | | |
| LnGrp LOS | D | A | A | A | D | B | D | A | D | | | |
| Approach Vol, veh/h | 980 | | | | 979 | | | | 437 | | | |
| Approach Delay, s/veh | 10.6 | | | | 40.6 | | | | 38.1 | | | |
| Approach LOS | B | | | | D | | | | D | | | |
| Timer - Assigned Phs | 2 | | | 4 | | | 7 | | | 8 | | |
| Phs Duration (G+Y+Rc), s | 26.0 | | | 64.0 | | | 15.0 | | | 49.0 | | |
| Change Period (Y+Rc), s | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | | |
| Max Green Setting (Gmax), s | 20.0 | | | 58.0 | | | 9.0 | | | 43.0 | | |
| Max Q Clear Time (g_c+I1), s | 13.0 | | | 2.0 | | | 9.4 | | | 44.0 | | |
| Green Ext Time (p_c), s | 1.2 | | | 5.6 | | | 0.0 | | | 0.0 | | |

Intersection Summary

| | |
|--------------------|------|
| HCM 6th Ctrl Delay | 27.9 |
| HCM 6th LOS | C |

Notes

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

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 150 | 245 | 496 | 340 | 385 | 45 | 307 | 670 | 116 | 40 | 620 | 170 |
| Future Volume (vph) | 150 | 245 | 496 | 340 | 385 | 45 | 307 | 670 | 116 | 40 | 620 | 170 |
| Turn Type | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 5 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 5 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 4.0 | 4.0 | 3.0 | 5.0 | 5.0 | 4.0 | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 |
| Minimum Split (s) | 8.0 | 32.0 | 9.0 | 8.0 | 32.0 | 32.0 | 9.0 | 40.0 | 40.0 | 9.0 | 29.0 | 29.0 |
| Total Split (s) | 12.0 | 32.0 | 24.0 | 25.0 | 45.0 | 45.0 | 24.0 | 54.0 | 54.0 | 9.0 | 39.0 | 39.0 |
| Total Split (%) | 10.0% | 26.7% | 20.0% | 20.8% | 37.5% | 37.5% | 20.0% | 45.0% | 45.0% | 7.5% | 32.5% | 32.5% |
| Yellow Time (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120









Actuated Cycle Length: 120













Offset: 108.5 (90%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 3: Gun Club Road & Jewell Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 9 s | 54 s | 25 s | 32 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 24 s | 39 s | 12 s | 45 s |

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 158 | 258 | 522 | 391 | 443 | 52 | 472 | 1031 | 178 | 46 | 713 | 195 |
| v/c Ratio | 0.85 | 0.72 | 0.75 | 0.85 | 0.86 | 0.09 | 0.82 | 0.63 | 0.22 | 0.21 | 0.64 | 0.31 |
| Control Delay | 92.0 | 56.6 | 30.2 | 67.9 | 57.0 | 0.3 | 60.3 | 28.6 | 4.0 | 19.4 | 39.3 | 5.6 |
| 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 | 92.0 | 56.6 | 30.2 | 67.9 | 57.0 | 0.3 | 60.3 | 28.6 | 4.0 | 19.4 | 39.3 | 5.6 |
| Queue Length 50th (ft) | 63 | 187 | 254 | 154 | 324 | 0 | 177 | 334 | 0 | 16 | 259 | 0 |
| Queue Length 95th (ft) | #122 | 275 | 404 | 194 | 402 | 0 | 169 | 273 | 7 | 38 | 323 | 47 |
| Internal Link Dist (ft) | 2523 | | | 1479 | | | 1470 | | | 790 | | |
| Turn Bay Length (ft) | 220 | | 330 | 300 | | | 485 | | 360 | 200 | | 325 |
| Base Capacity (vph) | 192 | 403 | 699 | 572 | 621 | 637 | 589 | 1629 | 825 | 220 | 1116 | 635 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.82 | 0.64 | 0.75 | 0.68 | 0.71 | 0.08 | 0.80 | 0.63 | 0.22 | 0.21 | 0.64 | 0.31 |

Intersection Summary

























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

HCM 6th Signalized Intersection Summary

11/22/2023

3: Gun Club Road & Jewell Avenue

2027 Bkgrd + Proj - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 150 | 245 | 496 | 340 | 385 | 45 | 307 | 670 | 116 | 40 | 620 | 170 |
| Future Volume (veh/h) | 150 | 245 | 496 | 340 | 385 | 45 | 307 | 670 | 116 | 40 | 620 | 170 |
| 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 | 1811 | 1811 | 1811 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1841 | 1841 | 1841 |
| Adj Flow Rate, veh/h | 158 | 258 | 522 | 391 | 443 | 52 | 472 | 1031 | 178 | 46 | 713 | 195 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.87 | 0.87 | 0.87 | 0.65 | 0.65 | 0.65 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 6 | 6 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 |
| Cap, veh/h | 195 | 407 | 579 | 443 | 551 | 467 | 526 | 1581 | 705 | 206 | 1117 | 498 |
| Arrive On Green | 0.06 | 0.22 | 0.22 | 0.13 | 0.29 | 0.29 | 0.15 | 0.44 | 0.44 | 0.03 | 0.32 | 0.32 |
| Sat Flow, veh/h | 3346 | 1811 | 1535 | 3456 | 1870 | 1585 | 3456 | 3554 | 1585 | 1753 | 3497 | 1560 |
| Grp Volume(v), veh/h | 158 | 258 | 522 | 391 | 443 | 52 | 472 | 1031 | 178 | 46 | 713 | 195 |
| Grp Sat Flow(s),veh/h/ln | 1673 | 1811 | 1535 | 1728 | 1870 | 1585 | 1728 | 1777 | 1585 | 1753 | 1749 | 1560 |
| Q Serve(g_s), s | 5.6 | 15.4 | 27.0 | 13.3 | 26.3 | 2.9 | 16.1 | 27.2 | 8.4 | 2.1 | 20.9 | 11.7 |
| Cycle Q Clear(g_c), s | 5.6 | 15.4 | 27.0 | 13.3 | 26.3 | 2.9 | 16.1 | 27.2 | 8.4 | 2.1 | 20.9 | 11.7 |
| 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 | 195 | 407 | 579 | 443 | 551 | 467 | 526 | 1581 | 705 | 206 | 1117 | 498 |
| V/C Ratio(X) | 0.81 | 0.63 | 0.90 | 0.88 | 0.80 | 0.11 | 0.90 | 0.65 | 0.25 | 0.22 | 0.64 | 0.39 |
| Avail Cap(c_a), veh/h | 195 | 407 | 579 | 576 | 623 | 528 | 547 | 1581 | 705 | 218 | 1117 | 498 |
| 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) | 0.78 | 0.78 | 0.78 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.8 | 42.0 | 35.3 | 51.4 | 39.1 | 30.8 | 49.9 | 26.0 | 20.8 | 27.0 | 34.9 | 31.8 |
| Incr Delay (d2), s/veh | 16.6 | 2.5 | 14.2 | 10.4 | 6.8 | 0.1 | 17.1 | 2.1 | 0.9 | 0.5 | 2.8 | 2.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.8 | 7.0 | 15.9 | 6.3 | 12.6 | 1.1 | 7.9 | 11.0 | 3.2 | 0.9 | 8.8 | 4.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 72.5 | 44.5 | 49.5 | 61.9 | 45.9 | 30.9 | 67.0 | 28.1 | 21.7 | 27.5 | 37.7 | 34.1 |
| LnGrp LOS | E | D | D | E | D | C | E | C | C | C | D | C |
| Approach Vol, veh/h | | 938 | | | 886 | | | 1681 | | | 954 | |
| Approach Delay, s/veh | | 52.0 | | | 52.0 | | | 38.4 | | | 36.5 | |
| Approach LOS | | D | | | D | | | D | | | D | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 8.2 | 59.4 | 20.4 | 32.0 | 23.3 | 44.3 | 12.0 | 40.4 | | | | |
| 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 | 4.0 | 48.0 | 20.0 | 27.0 | 19.0 | 33.0 | 7.0 | 40.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 4.1 | 29.2 | 15.3 | 29.0 | 18.1 | 22.9 | 7.6 | 28.3 | | | | |
| Green Ext Time (p_c), s | 0.0 | 13.4 | 0.0 | 0.0 | 0.2 | 6.5 | 0.0 | 2.1 | | | | |

Intersection Summary























HCM 6th Ctrl Delay 43.5

HCM 6th LOS D

Notes

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

| Intersection | | | | | | |
|--------------------------|--------|--------|-------|--------|------|------|
| Int Delay, s/veh | 0.5 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | ↗ | ↘ | ↗↘ | ↗↘ | ↗ |
| Traffic Vol, veh/h | 0 | 10 | 69 | 1114 | 1085 | 100 |
| Future Vol, veh/h | 0 | 10 | 69 | 1114 | 1085 | 100 |
| 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 | 200 | - | - | 200 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 95 | 95 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 11 | 75 | 1173 | 1142 | 109 |
| Major/Minor | Minor2 | Major1 | | Major2 | | |
| Conflicting Flow All | - | 571 | 1251 | 0 | - | 0 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | 6.94 | 4.14 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | 3.32 | 2.22 | - | - | - |
| Pot Cap-1 Maneuver | 0 | 464 | 552 | - | - | - |
| Stage 1 | 0 | - | - | - | - | - |
| Stage 2 | 0 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | - | 464 | 552 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Approach | EB | NB | | SB | | |
| HCM Control Delay, s | 12.9 | 0.8 | | 0 | | |
| HCM LOS | B | | | | | |
| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR | |
| Capacity (veh/h) | 552 | - | 464 | - | - | |
| HCM Lane V/C Ratio | 0.136 | - | 0.023 | - | - | |
| HCM Control Delay (s) | 12.5 | - | 12.9 | - | - | |
| HCM Lane LOS | B | - | B | - | - | |
| HCM 95th %tile Q(veh) | 0.5 | - | 0.1 | - | - | |

| |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 50 | 5 | 55 | 5 | 45 | 108 | 1088 | 30 | 75 | 895 | 125 |
| Future Volume (vph) | 50 | 5 | 55 | 5 | 45 | 108 | 1088 | 30 | 75 | 895 | 125 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 8 | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 33.0 | 11.0 | 33.0 | 33.0 | 11.0 | 30.0 | 30.0 | 11.0 | 30.0 | 30.0 |
| Total Split (s) | 20.0 | 42.0 | 20.0 | 42.0 | 42.0 | 20.0 | 38.0 | 38.0 | 20.0 | 38.0 | 38.0 |
| Total Split (%) | 16.7% | 35.0% | 16.7% | 35.0% | 35.0% | 16.7% | 31.7% | 31.7% | 16.7% | 31.7% | 31.7% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120









Actuated Cycle Length: 120












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

Natural Cycle: 85

Control Type: Actuated-Coordinated

Splits and Phases: 102: Gun Club Road & Yale Avenue
























| | | | |
|--|--|--|--|
|  Ø1 |  Ø2 (R) |  Ø3 |  Ø4 |
| 20 s | 38 s | 20 s | 42 s |
|  Ø5 |  Ø6 (R) |  Ø7 |  Ø8 |
| 20 s | 38 s | 20 s | 42 s |

| |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 54 | 18 | 60 | 5 | 49 | 117 | 1145 | 33 | 82 | 942 | 136 |
| v/c Ratio | 0.30 | 0.15 | 0.25 | 0.04 | 0.21 | 0.28 | 0.49 | 0.03 | 0.24 | 0.42 | 0.13 |
| Control Delay | 48.4 | 32.2 | 42.9 | 52.8 | 2.0 | 7.5 | 14.5 | 0.1 | 7.5 | 13.5 | 2.4 |
| 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 | 48.4 | 32.2 | 42.9 | 52.8 | 2.0 | 7.5 | 14.5 | 0.1 | 7.5 | 13.5 | 2.4 |
| Queue Length 50th (ft) | 41 | 4 | 39 | 4 | 0 | 25 | 262 | 0 | 17 | 202 | 0 |
| Queue Length 95th (ft) | 70 | 28 | 77 | 17 | 0 | 48 | 370 | 0 | 36 | 280 | 29 |
| Internal Link Dist (ft) | | 816 | | 718 | | | 2631 | | | 1641 | |
| Turn Bay Length (ft) | 150 | | 350 | | 10 | 300 | | 300 | 300 | | 300 |
| Base Capacity (vph) | 256 | 507 | 279 | 558 | 570 | 494 | 2358 | 1100 | 430 | 2249 | 1055 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.21 | 0.04 | 0.22 | 0.01 | 0.09 | 0.24 | 0.49 | 0.03 | 0.19 | 0.42 | 0.13 |
| Intersection Summary | | | | | | | | | | | |

HCM 6th Signalized Intersection Summary

11/22/2023

102: Gun Club Road & Yale Avenue
2027 Bkgrd + Proj - AM Peak Hour





















| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 50 | 5 | 12 | 55 | 5 | 45 | 108 | 1088 | 30 | 75 | 895 | 125 |
| Future Volume (veh/h) | 50 | 5 | 12 | 55 | 5 | 45 | 108 | 1088 | 30 | 75 | 895 | 125 |
| 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 | 54 | 5 | 13 | 60 | 5 | 0 | 117 | 1145 | 33 | 82 | 942 | 136 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.95 | 0.92 | 0.92 | 0.95 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 214 | 28 | 74 | 206 | 123 | | 411 | 2337 | 1042 | 365 | 2330 | 1039 |
| Arrive On Green | 0.04 | 0.06 | 0.06 | 0.04 | 0.07 | 0.00 | 0.04 | 0.66 | 0.66 | 0.04 | 0.66 | 0.66 |
| Sat Flow, veh/h | 1781 | 460 | 1195 | 1781 | 1870 | 1585 | 1781 | 3554 | 1585 | 1781 | 3554 | 1585 |
| Grp Volume(v), veh/h | 54 | 0 | 18 | 60 | 5 | 0 | 117 | 1145 | 33 | 82 | 942 | 136 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1655 | 1781 | 1870 | 1585 | 1781 | 1777 | 1585 | 1781 | 1777 | 1585 |
| Q Serve(g_s), s | 3.4 | 0.0 | 1.2 | 3.8 | 0.3 | 0.0 | 2.6 | 19.5 | 0.9 | 1.8 | 14.9 | 3.9 |
| Cycle Q Clear(g_c), s | 3.4 | 0.0 | 1.2 | 3.8 | 0.3 | 0.0 | 2.6 | 19.5 | 0.9 | 1.8 | 14.9 | 3.9 |
| Prop In Lane | 1.00 | | 0.72 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 214 | 0 | 102 | 206 | 123 | | 411 | 2337 | 1042 | 365 | 2330 | 1039 |
| V/C Ratio(X) | 0.25 | 0.00 | 0.18 | 0.29 | 0.04 | | 0.28 | 0.49 | 0.03 | 0.22 | 0.40 | 0.13 |
| Avail Cap(c_a), veh/h | 355 | 0 | 497 | 339 | 561 | | 546 | 2337 | 1042 | 503 | 2330 | 1039 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 50.2 | 0.0 | 53.4 | 49.9 | 52.5 | 0.0 | 7.1 | 10.4 | 7.2 | 7.7 | 9.7 | 7.8 |
| Incr Delay (d2), s/veh | 0.6 | 0.0 | 0.8 | 0.8 | 0.1 | 0.0 | 0.4 | 0.7 | 0.1 | 0.3 | 0.5 | 0.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.5 | 0.0 | 0.5 | 1.7 | 0.1 | 0.0 | 0.8 | 6.5 | 0.3 | 0.6 | 5.0 | 1.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 50.8 | 0.0 | 54.2 | 50.7 | 52.7 | 0.0 | 7.5 | 11.1 | 7.2 | 8.0 | 10.2 | 8.0 |
| LnGrp LOS | D | A | D | D | D | | A | B | A | A | B | A |
| Approach Vol, veh/h | | 72 | | | 65 | | | 1295 | | | 1160 | |
| Approach Delay, s/veh | | 51.7 | | | 50.8 | | | 10.7 | | | 9.8 | |
| Approach LOS | | D | | | D | | | B | | | A | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 10.7 | 84.9 | 11.0 | 13.4 | 10.9 | 84.7 | 10.5 | 13.9 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 14.0 | 32.0 | 14.0 | 36.0 | 14.0 | 32.0 | 14.0 | 36.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.8 | 21.5 | 5.8 | 3.2 | 4.6 | 16.9 | 5.4 | 2.3 | | | | |
| Green Ext Time (p_c), s | 0.1 | 5.1 | 0.1 | 0.1 | 0.2 | 5.5 | 0.1 | 0.0 | | | | |

Intersection Summary

HCM 6th Ctrl Delay 12.4
HCM 6th LOS B

Notes

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

| |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 73 | 1 | 5 | 1 | 73 | 1026 | 15 | 20 | 1161 | 194 |
| Future Volume (vph) | 73 | 1 | 5 | 1 | 73 | 1026 | 15 | 20 | 1161 | 194 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 38.0 | 11.0 | 38.0 | 11.0 | 28.0 | 28.0 | 11.0 | 28.0 | 28.0 |
| Total Split (s) | 11.0 | 38.0 | 11.0 | 38.0 | 11.0 | 30.0 | 30.0 | 11.0 | 30.0 | 30.0 |
| Total Split (%) | 12.2% | 42.2% | 12.2% | 42.2% | 12.2% | 33.3% | 33.3% | 12.2% | 33.3% | 33.3% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 90









Actuated Cycle Length: 90











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

Natural Cycle: 100

Control Type: Actuated-Coordinated

Splits and Phases: 103: Gun Club Road & Addison Avenue























| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 11 s | 30 s | 11 s | 38 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 11 s | 30 s | 11 s | 38 s |

| |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 79 | 22 | 5 | 17 | 79 | 1115 | 16 | 22 | 1262 | 211 |
| v/c Ratio | 0.53 | 0.13 | 0.03 | 0.11 | 0.25 | 0.43 | 0.01 | 0.06 | 0.53 | 0.19 |
| Control Delay | 47.3 | 17.5 | 30.4 | 20.2 | 6.5 | 9.2 | 0.0 | 5.3 | 12.6 | 2.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 47.3 | 17.5 | 30.4 | 20.2 | 6.5 | 9.2 | 0.0 | 5.3 | 12.6 | 2.3 |
| Queue Length 50th (ft) | 45 | 1 | 3 | 1 | 7 | 68 | 0 | 2 | 171 | 0 |
| Queue Length 95th (ft) | 76 | 23 | 11 | 21 | 29 | 287 | 0 | 12 | 361 | 34 |
| Internal Link Dist (ft) | | 564 | | 952 | | 985 | | | 915 | |
| Turn Bay Length (ft) | 300 | | 350 | | 350 | | 350 | 350 | | 350 |
| Base Capacity (vph) | 150 | 581 | 158 | 579 | 311 | 2582 | 1204 | 375 | 2367 | 1128 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.53 | 0.04 | 0.03 | 0.03 | 0.25 | 0.43 | 0.01 | 0.06 | 0.53 | 0.19 |
| Intersection Summary | | | | | | | | | | |

HCM 6th Signalized Intersection Summary

11/22/2023

103: Gun Club Road & Addison Avenue
2027 Bkgrd + Proj - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  | |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 73 | 1 | 19 | 5 | 1 | 15 | 73 | 1026 | 15 | 20 | 1161 | 194 |
| Future Volume (veh/h) | 73 | 1 | 19 | 5 | 1 | 15 | 73 | 1026 | 15 | 20 | 1161 | 194 |
| 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 | 79 | 1 | 21 | 5 | 1 | 16 | 79 | 1115 | 16 | 22 | 1262 | 211 |
| 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 | 246 | 5 | 96 | 240 | 6 | 89 | 286 | 2118 | 945 | 327 | 2031 | 906 |
| Arrive On Green | 0.05 | 0.06 | 0.06 | 0.05 | 0.06 | 0.06 | 0.05 | 0.60 | 0.60 | 0.02 | 0.57 | 0.57 |
| Sat Flow, veh/h | 1781 | 73 | 1524 | 1781 | 94 | 1505 | 1781 | 3554 | 1585 | 1781 | 3554 | 1585 |
| Grp Volume(v), veh/h | 79 | 0 | 22 | 5 | 0 | 17 | 79 | 1115 | 16 | 22 | 1262 | 211 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1596 | 1781 | 0 | 1599 | 1781 | 1777 | 1585 | 1781 | 1777 | 1585 |
| Q Serve(g_s), s | 3.7 | 0.0 | 1.2 | 0.2 | 0.0 | 0.9 | 1.6 | 16.6 | 0.4 | 0.5 | 21.2 | 5.9 |
| Cycle Q Clear(g_c), s | 3.7 | 0.0 | 1.2 | 0.2 | 0.0 | 0.9 | 1.6 | 16.6 | 0.4 | 0.5 | 21.2 | 5.9 |
| Prop In Lane | 1.00 | | 0.95 | 1.00 | | 0.94 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 246 | 0 | 100 | 240 | 0 | 95 | 286 | 2118 | 945 | 327 | 2031 | 906 |
| V/C Ratio(X) | 0.32 | 0.00 | 0.22 | 0.02 | 0.00 | 0.18 | 0.28 | 0.53 | 0.02 | 0.07 | 0.62 | 0.23 |
| Avail Cap(c_a), veh/h | 248 | 0 | 568 | 248 | 0 | 569 | 300 | 2118 | 945 | 384 | 2031 | 906 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.0 | 0.0 | 40.1 | 35.7 | 0.0 | 40.2 | 10.0 | 10.7 | 7.4 | 8.7 | 12.8 | 9.5 |
| Incr Delay (d2), s/veh | 0.7 | 0.0 | 1.1 | 0.0 | 0.0 | 0.9 | 0.5 | 0.9 | 0.0 | 0.1 | 1.4 | 0.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 0.0 | 0.5 | 0.1 | 0.0 | 0.4 | 0.5 | 5.2 | 0.1 | 0.1 | 7.0 | 2.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 37.7 | 0.0 | 41.2 | 35.8 | 0.0 | 41.1 | 10.5 | 11.6 | 7.5 | 8.8 | 14.2 | 10.1 |
| LnGrp LOS | D | A | D | D | A | D | B | B | A | A | B | B |
| Approach Vol, veh/h | | 101 | | | 22 | | | 1210 | | | 1495 | |
| Approach Delay, s/veh | | 38.5 | | | 39.9 | | | 11.5 | | | 13.6 | |
| Approach LOS | | D | | | D | | | B | | | B | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 8.1 | 59.6 | 10.6 | 11.6 | 10.3 | 57.4 | 10.9 | 11.3 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 5.0 | 24.0 | 5.0 | 32.0 | 5.0 | 24.0 | 5.0 | 32.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.5 | 18.6 | 2.2 | 3.2 | 3.6 | 23.2 | 5.7 | 2.9 | | | | |
| Green Ext Time (p_c), s | 0.0 | 3.0 | 0.0 | 0.1 | 0.0 | 0.6 | 0.0 | 0.0 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 13.8 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

Intersection

Int Delay, s/veh 0.2

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations | | ↗ | ↘ | ↗↘ | ↗↘ | ↗ |
| Traffic Vol, veh/h | 0 | 6 | 21 | 1093 | 1369 | 87 |
| Future Vol, veh/h | 0 | 6 | 21 | 1093 | 1369 | 87 |
| 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 | 300 | - | - | 300 |
| 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 | 0 | 7 | 23 | 1188 | 1488 | 95 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - | 744 | 1583 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | - | 6.94 | 4.14 |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | - | 3.32 | 2.22 |
| Pot Cap-1 Maneuver | 0 | 357 | 411 |
| Stage 1 | 0 | - | - |
| Stage 2 | 0 | - | - |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | - | 357 | 411 |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |

| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 15.3 | 0.3 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h) | 411 | - | 357 | - | - |
| HCM Lane V/C Ratio | 0.056 | - | 0.018 | - | - |
| HCM Control Delay (s) | 14.3 | - | 15.3 | - | - |
| HCM Lane LOS | B | - | C | - | - |
| HCM 95th %tile Q(veh) | 0.2 | - | 0.1 | - | - |

| | → | ↘ | ↙ | ← | ↓ | ↗ |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Configurations | ↑ | ↗ | ↙ | ↑ | ↖ | ↗ |
| Traffic Volume (vph) | 805 | 320 | 227 | 738 | 5 | 260 |
| Future Volume (vph) | 805 | 320 | 227 | 738 | 5 | 260 |
| Turn Type | NA | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 3 | 8 | 6 | |
| Permitted Phases | | 4 | 8 | | | 6 |
| Detector Phase | 4 | 4 | 3 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.0 | 25.0 | 12.5 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 50.5 | 50.5 | 12.5 | 63.0 | 27.0 | 27.0 |
| Total Split (%) | 56.1% | 56.1% | 13.9% | 70.0% | 30.0% | 30.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Max | C-Max | None | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90







Offset: 83 (92%), Referenced to phase 4:EBT and 8:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 1: E-470 Southbound Ramps & Jewell Avenue

| | | |
|------|----------|----------|
| ↘ Ø6 | ↙ Ø3 | → Ø4 (R) |
| 27 s | 12.5 s | 50.5 s |
| | ← Ø8 (R) | |
| | 63 s | |













| |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Group Flow (vph) | 847 | 337 | 236 | 769 | 103 | 302 |
| v/c Ratio | 0.92 | 0.35 | 1.12 | 0.65 | 0.26 | 0.57 |
| Control Delay | 38.2 | 2.6 | 105.1 | 12.1 | 30.3 | 13.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 |
| Total Delay | 38.2 | 2.6 | 105.1 | 12.5 | 30.3 | 13.7 |
| Queue Length 50th (ft) | 427 | 0 | ~132 | 212 | 48 | 37 |
| Queue Length 95th (ft) | #687 | 41 | m#124 | m213 | 88 | 103 |
| Internal Link Dist (ft) | 679 | | | 530 | 532 | |
| Turn Bay Length (ft) | | 300 | 250 | | | |
| Base Capacity (vph) | 921 | 953 | 210 | 1179 | 399 | 526 |
| Starvation Cap Reductn | 0 | 0 | 0 | 109 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.92 | 0.35 | 1.12 | 0.72 | 0.26 | 0.57 |
| Intersection Summary | | | | | | |
| ~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. | | | | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. | | | | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | | | | |













HCM 6th Signalized Intersection Summary

1: E-470 Southbound Ramps & Jewell Avenue

11/22/2023

2027 Bkgrd + Proj - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↑ | ↗ | ↖ | ↑ | | | | | | ↖ | ↗ |
| Traffic Volume (veh/h) | 0 | 805 | 320 | 227 | 738 | 0 | 0 | 0 | 0 | 83 | 5 | 260 |
| Future Volume (veh/h) | 0 | 805 | 320 | 227 | 738 | 0 | 0 | 0 | 0 | 83 | 5 | 260 |
| Initial Q (Qb), veh | 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 |
| Parking Bus, Adj | 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 | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 1870 | 1870 | 0 | | | | 1811 | 1811 | 1811 |
| Adj Flow Rate, veh/h | 0 | 847 | 337 | 236 | 769 | 0 | | | | 97 | 6 | 302 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.96 | 0.96 | 0.96 | | | | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 0 | | | | 6 | 6 | 6 |
| Cap, veh/h | 0 | 925 | 784 | 245 | 1185 | 0 | | | | 380 | 24 | 358 |
| Arrive On Green | 0.00 | 0.49 | 0.49 | 0.14 | 1.00 | 0.00 | | | | 0.23 | 0.23 | 0.23 |
| Sat Flow, veh/h | 0 | 1870 | 1585 | 1781 | 1870 | 0 | | | | 1629 | 101 | 1535 |
| Grp Volume(v), veh/h | 0 | 847 | 337 | 236 | 769 | 0 | | | | 103 | 0 | 302 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1870 | 1585 | 1781 | 1870 | 0 | | | | 1730 | 0 | 1535 |
| Q Serve(g_s), s | 0.0 | 37.7 | 12.3 | 6.2 | 0.0 | 0.0 | | | | 4.4 | 0.0 | 16.9 |
| Cycle Q Clear(g_c), s | 0.0 | 37.7 | 12.3 | 6.2 | 0.0 | 0.0 | | | | 4.4 | 0.0 | 16.9 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 0.00 | | | | 0.94 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 925 | 784 | 245 | 1185 | 0 | | | | 404 | 0 | 358 |
| V/C Ratio(X) | 0.00 | 0.92 | 0.43 | 0.96 | 0.65 | 0.00 | | | | 0.26 | 0.00 | 0.84 |
| Avail Cap(c_a), veh/h | 0 | 925 | 784 | 245 | 1185 | 0 | | | | 404 | 0 | 358 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.09 | 0.09 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 21.0 | 14.6 | 18.7 | 0.0 | 0.0 | | | | 28.1 | 0.0 | 32.9 |
| Incr Delay (d2), s/veh | 0.0 | 15.1 | 1.7 | 10.4 | 0.3 | 0.0 | | | | 1.5 | 0.0 | 20.9 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 17.9 | 4.3 | 2.7 | 0.1 | 0.0 | | | | 2.0 | 0.0 | 8.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 36.2 | 16.3 | 29.1 | 0.3 | 0.0 | | | | 29.6 | 0.0 | 53.8 |
| LnGrp LOS | A | D | B | C | A | A | | | | C | A | D |
| Approach Vol, veh/h | | 1184 | | | 1005 | | | | | | 405 | |
| Approach Delay, s/veh | | 30.5 | | | 7.0 | | | | | | 47.7 | |
| Approach LOS | | C | | | A | | | | | | D | |
| Timer - Assigned Phs | | | 3 | 4 | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | | | 12.5 | 50.5 | | 27.0 | | 63.0 | | | | |
| Change Period (Y+Rc), s | | | 6.0 | 6.0 | | 6.0 | | 6.0 | | | | |
| Max Green Setting (Gmax), s | | | 6.5 | 44.5 | | 21.0 | | 57.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | | 8.2 | 39.7 | | 18.9 | | 2.0 | | | | |
| Green Ext Time (p_c), s | | | 0.0 | 2.8 | | 0.4 | | 5.9 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 24.1 | | | | | | | | | |
| HCM 6th LOS | | | C | | | | | | | | | |

| |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
| Lane Configurations |  |  |  |  |  |  |
| Traffic Volume (vph) | 195 | 693 | 845 | 246 | 0 | 100 |
| Future Volume (vph) | 195 | 693 | 845 | 246 | 0 | 100 |
| Turn Type | pm+pt | NA | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 8 | | 2 | |
| Permitted Phases | 4 | | | 8 | | 2 |
| Detector Phase | 7 | 4 | 8 | 8 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 3.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.5 | 25.0 | 25.0 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 13.0 | 65.0 | 52.0 | 52.0 | 25.0 | 25.0 |
| Total Split (%) | 14.4% | 72.2% | 57.8% | 57.8% | 27.8% | 27.8% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Recall Mode | None | C-Max | C-Max | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90





Actuated Cycle Length: 90

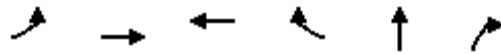
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Splits and Phases: 2: E-470 Northbound Ramps & Jewell Avenue

| | | |
|--|--|--|
|  Ø2 |  Ø4 (R) | |
| 25 s | 65 s | |
| |  Ø7 |  Ø8 (R) |
| | 13 s | 52 s |



| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
|-------------------------|-------|------|------|------|------|------|
| Lane Group Flow (vph) | 210 | 745 | 939 | 273 | 150 | 125 |
| v/c Ratio | 0.97 | 0.62 | 1.04 | 0.30 | 0.41 | 0.30 |
| Control Delay | 73.4 | 4.5 | 63.2 | 2.8 | 34.8 | 7.8 |
| Queue Delay | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 73.4 | 4.7 | 63.2 | 2.8 | 34.8 | 7.8 |
| Queue Length 50th (ft) | 90 | 60 | ~580 | 3 | 74 | 0 |
| Queue Length 95th (ft) | m#113 | m77 | #811 | 40 | 115 | 32 |
| Internal Link Dist (ft) | | 530 | 2523 | | 717 | |
| Turn Bay Length (ft) | 250 | | | 250 | | 175 |
| Base Capacity (vph) | 216 | 1197 | 907 | 899 | 362 | 423 |
| Starvation Cap Reductn | 0 | 70 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.97 | 0.66 | 1.04 | 0.30 | 0.41 | 0.30 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.



















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

HCM 6th Signalized Intersection Summary

2: E-470 Northbound Ramps & Jewell Avenue

11/22/2023

2027 Bkgrd + Proj - PM Peak Hour

























| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | | |  |  | |  |  | | | |
| Traffic Volume (veh/h) | 195 | 693 | 0 | 0 | 845 | 246 | 120 | 0 | 100 | 0 | 0 | 0 |
| Future Volume (veh/h) | 195 | 693 | 0 | 0 | 845 | 246 | 120 | 0 | 100 | 0 | 0 | 0 |
| Initial Q (Qb), veh | 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 | | | |
| Parking Bus, Adj | 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 | | | | | |
| Adj Sat Flow, veh/h/ln | 1841 | 1841 | 0 | 0 | 1796 | 1796 | 1826 | 1826 | 1826 | | | |
| Adj Flow Rate, veh/h | 210 | 745 | 0 | 0 | 939 | 273 | 150 | 0 | 125 | | | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.90 | 0.90 | 0.90 | 0.80 | 0.80 | 0.80 | | | |
| Percent Heavy Veh, % | 4 | 4 | 0 | 0 | 7 | 7 | 5 | 5 | 5 | | | |
| Cap, veh/h | 216 | 1207 | 0 | 0 | 918 | 778 | 367 | 0 | 327 | | | |
| Arrive On Green | 0.16 | 1.00 | 0.00 | 0.00 | 0.51 | 0.51 | 0.21 | 0.00 | 0.21 | | | |
| Sat Flow, veh/h | 1753 | 1841 | 0 | 0 | 1796 | 1522 | 1739 | 0 | 1547 | | | |
| Grp Volume(v), veh/h | 210 | 745 | 0 | 0 | 939 | 273 | 150 | 0 | 125 | | | |
| Grp Sat Flow(s),veh/h/ln | 1753 | 1841 | 0 | 0 | 1796 | 1522 | 1739 | 0 | 1547 | | | |
| Q Serve(g_s), s | 6.6 | 0.0 | 0.0 | 0.0 | 46.0 | 9.6 | 6.7 | 0.0 | 6.2 | | | |
| Cycle Q Clear(g_c), s | 6.6 | 0.0 | 0.0 | 0.0 | 46.0 | 9.6 | 6.7 | 0.0 | 6.2 | | | |
| Prop In Lane | 1.00 | | 0.00 | 0.00 | | 1.00 | 1.00 | | 1.00 | | | |
| Lane Grp Cap(c), veh/h | 216 | 1207 | 0 | 0 | 918 | 778 | 367 | 0 | 327 | | | |
| V/C Ratio(X) | 0.97 | 0.62 | 0.00 | 0.00 | 1.02 | 0.35 | 0.41 | 0.00 | 0.38 | | | |
| Avail Cap(c_a), veh/h | 216 | 1207 | 0 | 0 | 918 | 778 | 367 | 0 | 327 | | | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | |
| Upstream Filter(I) | 0.27 | 0.27 | 0.00 | 0.00 | 0.57 | 0.57 | 1.00 | 0.00 | 1.00 | | | |
| Uniform Delay (d), s/veh | 23.2 | 0.0 | 0.0 | 0.0 | 22.0 | 13.1 | 30.6 | 0.0 | 30.5 | | | |
| Incr Delay (d2), s/veh | 24.7 | 0.6 | 0.0 | 0.0 | 28.4 | 0.7 | 3.3 | 0.0 | 3.4 | | | |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | |
| %ile BackOfQ(50%),veh/ln | 3.4 | 0.2 | 0.0 | 0.0 | 23.5 | 3.0 | 3.1 | 0.0 | 2.6 | | | |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 47.9 | 0.6 | 0.0 | 0.0 | 50.4 | 13.8 | 34.0 | 0.0 | 33.8 | | | |
| LnGrp LOS | D | A | A | A | F | B | C | A | C | | | |
| Approach Vol, veh/h | 955 | | | | 1212 | | 275 | | | | | |
| Approach Delay, s/veh | 11.0 | | | | 42.1 | | 33.9 | | | | | |
| Approach LOS | B | | | | D | | C | | | | | |
| Timer - Assigned Phs | 2 | | | 4 | | | 7 | | 8 | | | |
| Phs Duration (G+Y+Rc), s | 25.0 | | | 65.0 | | | 13.0 | | 52.0 | | | |
| Change Period (Y+Rc), s | 6.0 | | | 6.0 | | | 6.0 | | 6.0 | | | |
| Max Green Setting (Gmax), s | 19.0 | | | 59.0 | | | 7.0 | | 46.0 | | | |
| Max Q Clear Time (g_c+I1), s | 8.7 | | | 2.0 | | | 8.6 | | 48.0 | | | |
| Green Ext Time (p_c), s | 0.9 | | | 5.6 | | | 0.0 | | 0.0 | | | |

Intersection Summary

| | |
|--------------------|------|
| HCM 6th Ctrl Delay | 29.1 |
| HCM 6th LOS | C |

Notes

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

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 180 | 335 | 278 | 250 | 350 | 40 | 556 | 761 | 373 | 15 | 906 | 185 |
| Future Volume (vph) | 180 | 335 | 278 | 250 | 350 | 40 | 556 | 761 | 373 | 15 | 906 | 185 |
| Turn Type | Prot | NA | pm+ov | Prot | NA | Perm | Prot | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 5 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 5 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 4.0 | 4.0 | 3.0 | 5.0 | 5.0 | 4.0 | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 |
| Minimum Split (s) | 8.0 | 32.0 | 9.0 | 8.0 | 32.0 | 32.0 | 9.0 | 40.0 | 40.0 | 9.0 | 29.0 | 29.0 |
| Total Split (s) | 15.0 | 37.0 | 25.0 | 16.0 | 38.0 | 38.0 | 25.0 | 58.0 | 58.0 | 9.0 | 42.0 | 42.0 |
| Total Split (%) | 12.5% | 30.8% | 20.8% | 13.3% | 31.7% | 31.7% | 20.8% | 48.3% | 48.3% | 7.5% | 35.0% | 35.0% |
| Yellow Time (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120



Actuated Cycle Length: 120













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

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 3: Gun Club Road & Jewell Avenue

| | | | |
|--|--|--|--|
|  Ø1 |  Ø2 (R) |  Ø3 |  Ø4 |
| 9 s | 58 s | 16 s | 37 s |
|  Ø5 |  Ø6 (R) |  Ø7 |  Ø8 |
| 25 s | 42 s | 15 s | 38 s |

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 191 | 356 | 296 | 258 | 361 | 41 | 585 | 801 | 393 | 16 | 954 | 195 |
| v/c Ratio | 0.78 | 0.85 | 0.38 | 0.88 | 0.81 | 0.08 | 0.87 | 0.46 | 0.40 | 0.06 | 0.88 | 0.31 |
| Control Delay | 76.0 | 63.2 | 16.5 | 83.4 | 57.6 | 0.3 | 62.1 | 20.9 | 3.4 | 16.2 | 50.3 | 5.7 |
| 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 | 76.0 | 63.2 | 16.5 | 83.4 | 57.6 | 0.3 | 62.1 | 20.9 | 3.4 | 16.2 | 50.3 | 5.7 |
| Queue Length 50th (ft) | 75 | 263 | 105 | 103 | 262 | 0 | 230 | 190 | 0 | 5 | 371 | 0 |
| Queue Length 95th (ft) | #117 | 364 | 174 | #173 | 365 | 0 | #374 | 300 | 57 | 17 | #485 | 54 |
| Internal Link Dist (ft) | 2523 | | | | 1479 | | | | 1470 | | 790 | |
| Turn Bay Length (ft) | 220 | | | 330 | 300 | | | 485 | | | 360 | 200 |
| Base Capacity (vph) | 280 | 487 | 777 | 308 | 502 | 545 | 670 | 1753 | 973 | 280 | 1086 | 621 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.68 | 0.73 | 0.38 | 0.84 | 0.72 | 0.08 | 0.87 | 0.46 | 0.40 | 0.06 | 0.88 | 0.31 |

Intersection Summary

























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

HCM 6th Signalized Intersection Summary

11/22/2023

3: Gun Club Road & Jewell Avenue

2027 Bkgrd + Proj - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 180 | 335 | 278 | 250 | 350 | 40 | 556 | 761 | 373 | 15 | 906 | 185 |
| Future Volume (veh/h) | 180 | 335 | 278 | 250 | 350 | 40 | 556 | 761 | 373 | 15 | 906 | 185 |
| 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 | 1841 | 1841 | 1841 | 1841 | 1841 | 1841 | 1796 | 1796 | 1796 | 1885 | 1885 | 1885 |
| Adj Flow Rate, veh/h | 191 | 356 | 296 | 258 | 361 | 41 | 585 | 801 | 393 | 16 | 954 | 195 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.97 | 0.97 | 0.97 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 1 | 1 | 1 |
| Cap, veh/h | 244 | 404 | 602 | 310 | 439 | 372 | 553 | 1709 | 762 | 249 | 1246 | 556 |
| Arrive On Green | 0.07 | 0.22 | 0.22 | 0.09 | 0.24 | 0.24 | 0.17 | 0.50 | 0.50 | 0.01 | 0.35 | 0.35 |
| Sat Flow, veh/h | 3401 | 1841 | 1560 | 3401 | 1841 | 1560 | 3319 | 3413 | 1522 | 1795 | 3582 | 1598 |
| Grp Volume(v), veh/h | 191 | 356 | 296 | 258 | 361 | 41 | 585 | 801 | 393 | 16 | 954 | 195 |
| Grp Sat Flow(s),veh/h/ln | 1700 | 1841 | 1560 | 1700 | 1841 | 1560 | 1659 | 1706 | 1522 | 1795 | 1791 | 1598 |
| Q Serve(g_s), s | 6.6 | 22.5 | 17.3 | 9.0 | 22.3 | 2.5 | 20.0 | 18.4 | 20.9 | 0.7 | 28.4 | 10.9 |
| Cycle Q Clear(g_c), s | 6.6 | 22.5 | 17.3 | 9.0 | 22.3 | 2.5 | 20.0 | 18.4 | 20.9 | 0.7 | 28.4 | 10.9 |
| 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 | 244 | 404 | 602 | 310 | 439 | 372 | 553 | 1709 | 762 | 249 | 1246 | 556 |
| V/C Ratio(X) | 0.78 | 0.88 | 0.49 | 0.83 | 0.82 | 0.11 | 1.06 | 0.47 | 0.52 | 0.06 | 0.77 | 0.35 |
| Avail Cap(c_a), veh/h | 283 | 491 | 676 | 312 | 506 | 429 | 553 | 1709 | 762 | 284 | 1246 | 556 |
| 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) | 0.79 | 0.79 | 0.79 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.8 | 45.3 | 27.9 | 53.6 | 43.3 | 35.7 | 50.0 | 19.5 | 20.2 | 24.7 | 34.8 | 29.1 |
| Incr Delay (d2), s/veh | 7.7 | 12.2 | 0.5 | 16.1 | 9.3 | 0.1 | 54.4 | 0.9 | 2.5 | 0.1 | 4.5 | 1.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.0 | 11.3 | 6.3 | 4.4 | 10.9 | 0.9 | 12.1 | 6.8 | 7.4 | 0.3 | 12.3 | 4.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 62.5 | 57.5 | 28.4 | 69.7 | 52.5 | 35.8 | 104.4 | 20.5 | 22.7 | 24.8 | 39.3 | 30.8 |
| LnGrp LOS | E | E | C | E | D | D | F | C | C | C | D | C |
| Approach Vol, veh/h | 843 | | | 660 | | | 1779 | | | 1165 | | |
| Approach Delay, s/veh | 48.4 | | | 58.2 | | | 48.6 | | | 37.7 | | |
| Approach LOS | D | | | E | | | D | | | D | | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 6.7 | 66.1 | 16.0 | 31.3 | 25.0 | 47.7 | 13.6 | 33.6 | | | | |
| 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 | 4.0 | 52.0 | 11.0 | 32.0 | 20.0 | 36.0 | 10.0 | 33.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.7 | 22.9 | 11.0 | 24.5 | 22.0 | 30.4 | 8.6 | 24.3 | | | | |
| Green Ext Time (p_c), s | 0.0 | 17.5 | 0.0 | 1.9 | 0.0 | 4.5 | 0.0 | 1.3 | | | | |

Intersection Summary

HCM 6th Ctrl Delay 47.1

HCM 6th LOS D

Notes

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

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0.3 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | ↗ | ↘ | ↗↘ | ↗↘ | ↗ |
| Traffic Vol, veh/h | 0 | 37 | 10 | 1450 | 1398 | 15 |
| Future Vol, veh/h | 0 | 37 | 10 | 1450 | 1398 | 15 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | 200 | - | - | 200 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 95 | 95 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 40 | 11 | 1526 | 1472 | 16 |























| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - | 736 | 1488 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | - | 6.94 | 4.14 |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | - | 3.32 | 2.22 |
| Pot Cap-1 Maneuver | 0 | 361 | 448 |
| Stage 1 | 0 | - | - |
| Stage 2 | 0 | - | - |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | - | 361 | 448 |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |

| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 16.2 | 0.1 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h) | 448 | - | 361 | - | - |
| HCM Lane V/C Ratio | 0.024 | - | 0.111 | - | - |
| HCM Control Delay (s) | 13.2 | - | 16.2 | - | - |
| HCM Lane LOS | B | - | C | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | 0.4 | - | - |

Timings
11/22/2023

102: Gun Club Road & Yale Avenue
2027 Bkgrd + Proj - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 305 | 5 | 95 | 5 | 75 | 17 | 1080 | 50 | 105 | 1310 | 20 |
| Future Volume (vph) | 305 | 5 | 95 | 5 | 75 | 17 | 1080 | 50 | 105 | 1310 | 20 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 8 | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 33.0 | 11.0 | 29.0 | 29.0 | 11.0 | 30.0 | 30.0 | 11.0 | 30.0 | 30.0 |
| Total Split (s) | 16.0 | 33.0 | 12.0 | 29.0 | 29.0 | 11.0 | 34.0 | 34.0 | 11.0 | 34.0 | 34.0 |
| Total Split (%) | 17.8% | 36.7% | 13.3% | 32.2% | 32.2% | 12.2% | 37.8% | 37.8% | 12.2% | 37.8% | 37.8% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 90









Actuated Cycle Length: 90












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

Natural Cycle: 95

Control Type: Actuated-Coordinated

Splits and Phases: 102: Gun Club Road & Yale Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 11 s | 34 s | 12 s | 33 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 11 s | 34 s | 16 s | 29 s |

| |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 332 | 83 | 103 | 5 | 82 | 18 | 1137 | 54 | 114 | 1379 | 22 |
| v/c Ratio | 1.19 | 0.30 | 0.49 | 0.03 | 0.27 | 0.08 | 0.68 | 0.06 | 0.40 | 0.68 | 0.02 |
| Control Delay | 145.9 | 12.9 | 36.0 | 38.0 | 2.1 | 8.8 | 22.5 | 0.1 | 11.4 | 22.1 | 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 |
| Total Delay | 145.9 | 12.9 | 36.0 | 38.0 | 2.1 | 8.8 | 22.5 | 0.1 | 11.4 | 22.1 | 0.1 |
| Queue Length 50th (ft) | ~193 | 3 | 46 | 3 | 0 | 4 | 270 | 0 | 45 | 435 | 0 |
| Queue Length 95th (ft) | #318 | 43 | 88 | 13 | 0 | 12 | 370 | 0 | m25 | 510 | m0 |
| Internal Link Dist (ft) | | 816 | | 718 | | | 2631 | | | 1641 | |
| Turn Bay Length (ft) | 150 | | 350 | | 10 | 300 | | 300 | 300 | | 300 |
| Base Capacity (vph) | 279 | 534 | 211 | 476 | 540 | 215 | 1670 | 843 | 283 | 2039 | 989 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.19 | 0.16 | 0.49 | 0.01 | 0.15 | 0.08 | 0.68 | 0.06 | 0.40 | 0.68 | 0.02 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.
























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

HCM 6th Signalized Intersection Summary

11/22/2023

102: Gun Club Road & Yale Avenue

2027 Bkgrd + Proj - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 305 | 5 | 72 | 95 | 5 | 75 | 17 | 1080 | 50 | 105 | 1310 | 20 |
| Future Volume (veh/h) | 305 | 5 | 72 | 95 | 5 | 75 | 17 | 1080 | 50 | 105 | 1310 | 20 |
| 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 | 332 | 5 | 78 | 103 | 5 | 0 | 18 | 1137 | 54 | 114 | 1379 | 22 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.95 | 0.92 | 0.92 | 0.95 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 399 | 13 | 199 | 311 | 165 | | 181 | 1712 | 764 | 285 | 1826 | 815 |
| Arrive On Green | 0.11 | 0.13 | 0.13 | 0.07 | 0.09 | 0.00 | 0.02 | 0.48 | 0.48 | 0.04 | 0.34 | 0.34 |
| Sat Flow, veh/h | 1781 | 96 | 1503 | 1781 | 1870 | 1585 | 1781 | 3554 | 1585 | 1781 | 3554 | 1585 |
| Grp Volume(v), veh/h | 332 | 0 | 83 | 103 | 5 | 0 | 18 | 1137 | 54 | 114 | 1379 | 22 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1600 | 1781 | 1870 | 1585 | 1781 | 1777 | 1585 | 1781 | 1777 | 1585 |
| Q Serve(g_s), s | 10.0 | 0.0 | 4.3 | 4.7 | 0.2 | 0.0 | 0.5 | 21.9 | 1.6 | 2.9 | 30.9 | 0.8 |
| Cycle Q Clear(g_c), s | 10.0 | 0.0 | 4.3 | 4.7 | 0.2 | 0.0 | 0.5 | 21.9 | 1.6 | 2.9 | 30.9 | 0.8 |
| Prop In Lane | 1.00 | | 0.94 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 399 | 0 | 212 | 311 | 165 | | 181 | 1712 | 764 | 285 | 1826 | 815 |
| V/C Ratio(X) | 0.83 | 0.00 | 0.39 | 0.33 | 0.03 | | 0.10 | 0.66 | 0.07 | 0.40 | 0.76 | 0.03 |
| Avail Cap(c_a), veh/h | 399 | 0 | 480 | 311 | 478 | | 244 | 1712 | 764 | 291 | 1826 | 815 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.67 | 0.67 | 0.67 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.9 | 0.0 | 35.7 | 34.1 | 37.5 | 0.0 | 15.9 | 17.8 | 12.5 | 14.2 | 24.5 | 14.6 |
| Incr Delay (d2), s/veh | 13.9 | 0.0 | 1.2 | 0.6 | 0.1 | 0.0 | 0.2 | 2.1 | 0.2 | 0.9 | 3.0 | 0.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.8 | 0.0 | 1.7 | 2.0 | 0.1 | 0.0 | 0.2 | 8.0 | 0.6 | 1.0 | 13.5 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 49.8 | 0.0 | 36.9 | 34.7 | 37.6 | 0.0 | 16.1 | 19.8 | 12.7 | 15.1 | 27.4 | 14.7 |
| LnGrp LOS | D | A | D | C | D | | B | B | B | B | C | B |
| Approach Vol, veh/h | | 415 | | | 108 | | | 1209 | | | 1515 | |
| Approach Delay, s/veh | | 47.2 | | | 34.9 | | | 19.5 | | | 26.3 | |
| Approach LOS | | D | | | C | | | B | | | C | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 10.7 | 49.4 | 12.0 | 17.9 | 7.8 | 52.3 | 16.0 | 13.9 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 5.0 | 28.0 | 6.0 | 27.0 | 5.0 | 28.0 | 10.0 | 23.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 4.9 | 23.9 | 6.7 | 6.3 | 2.5 | 32.9 | 12.0 | 2.2 | | | | |
| Green Ext Time (p_c), s | 0.0 | 2.5 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | | | | |





















Intersection Summary

| | |
|--------------------|------|
| HCM 6th Ctrl Delay | 26.7 |
| HCM 6th LOS | C |

Notes

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

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

| |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 278 | 3 | 23 | 3 | 34 | 1403 | 13 | 33 | 1316 | 63 |
| Future Volume (vph) | 278 | 3 | 23 | 3 | 34 | 1403 | 13 | 33 | 1316 | 63 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 33.0 | 11.0 | 33.0 | 11.0 | 28.0 | 28.0 | 11.0 | 28.0 | 28.0 |
| Total Split (s) | 16.0 | 33.0 | 11.0 | 28.0 | 11.0 | 35.0 | 35.0 | 11.0 | 35.0 | 35.0 |
| Total Split (%) | 17.8% | 36.7% | 12.2% | 31.1% | 12.2% | 38.9% | 38.9% | 12.2% | 38.9% | 38.9% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 90









Actuated Cycle Length: 90











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

Natural Cycle: 105

Control Type: Actuated-Coordinated

Splits and Phases: 103: Gun Club Road & Addison Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 11 s | 35 s | 11 s | 33 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 11 s | 35 s | 16 s | 28 s |

| |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 302 | 83 | 25 | 28 | 37 | 1525 | 14 | 36 | 1430 | 68 |
| v/c Ratio | 1.24 | 0.31 | 0.15 | 0.17 | 0.16 | 0.71 | 0.01 | 0.17 | 0.66 | 0.07 |
| Control Delay | 171.9 | 12.4 | 31.1 | 19.5 | 6.1 | 11.8 | 0.0 | 8.3 | 16.9 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 171.9 | 12.4 | 31.1 | 19.5 | 6.1 | 11.8 | 0.0 | 8.3 | 16.9 | 0.1 |
| Queue Length 50th (ft) | ~243 | 2 | 14 | 2 | 3 | 143 | 0 | 4 | 244 | 0 |
| Queue Length 95th (ft) | #260 | 42 | 30 | 27 | m10 | m#247 | m0 | 19 | #528 | 0 |
| Internal Link Dist (ft) | | 564 | | 952 | | 985 | | | 915 | |
| Turn Bay Length (ft) | 300 | | 350 | | 350 | | 350 | 350 | | 350 |
| Base Capacity (vph) | 243 | 533 | 164 | 413 | 226 | 2156 | 1035 | 211 | 2156 | 1035 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.24 | 0.16 | 0.15 | 0.07 | 0.16 | 0.71 | 0.01 | 0.17 | 0.66 | 0.07 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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























Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary

11/22/2023

103: Gun Club Road & Addison Avenue
2027 Bkgrd + Proj - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  | |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 278 | 3 | 74 | 23 | 3 | 23 | 34 | 1403 | 13 | 33 | 1316 | 63 |
| Future Volume (veh/h) | 278 | 3 | 74 | 23 | 3 | 23 | 34 | 1403 | 13 | 33 | 1316 | 63 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 302 | 3 | 80 | 25 | 3 | 25 | 37 | 1525 | 14 | 36 | 1430 | 68 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 374 | 8 | 217 | 292 | 15 | 124 | 203 | 1789 | 798 | 308 | 1787 | 797 |
| Arrive On Green | 0.11 | 0.14 | 0.14 | 0.06 | 0.09 | 0.09 | 0.07 | 1.00 | 1.00 | 0.03 | 0.50 | 0.50 |
| Sat Flow, veh/h | 1781 | 58 | 1536 | 1781 | 173 | 1439 | 1781 | 3554 | 1585 | 1781 | 3554 | 1585 |
| Grp Volume(v), veh/h | 302 | 0 | 83 | 25 | 0 | 28 | 37 | 1525 | 14 | 36 | 1430 | 68 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1594 | 1781 | 0 | 1611 | 1781 | 1777 | 1585 | 1781 | 1777 | 1585 |
| Q Serve(g_s), s | 10.0 | 0.0 | 4.2 | 1.1 | 0.0 | 1.5 | 0.9 | 0.0 | 0.0 | 0.9 | 30.1 | 2.0 |
| Cycle Q Clear(g_c), s | 10.0 | 0.0 | 4.2 | 1.1 | 0.0 | 1.5 | 0.9 | 0.0 | 0.0 | 0.9 | 30.1 | 2.0 |
| Prop In Lane | 1.00 | | 0.96 | 1.00 | | 0.89 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 374 | 0 | 226 | 292 | 0 | 138 | 203 | 1789 | 798 | 308 | 1787 | 797 |
| V/C Ratio(X) | 0.81 | 0.00 | 0.37 | 0.09 | 0.00 | 0.20 | 0.18 | 0.85 | 0.02 | 0.12 | 0.80 | 0.09 |
| Avail Cap(c_a), veh/h | 374 | 0 | 478 | 292 | 0 | 394 | 242 | 1789 | 798 | 348 | 1787 | 797 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.0 | 0.0 | 35.0 | 33.6 | 0.0 | 38.3 | 14.9 | 0.0 | 0.0 | 9.9 | 18.6 | 11.6 |
| Incr Delay (d2), s/veh | 12.3 | 0.0 | 1.0 | 0.1 | 0.0 | 0.7 | 0.4 | 5.4 | 0.0 | 0.2 | 3.9 | 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(50%),veh/ln | 2.8 | 0.0 | 1.7 | 0.5 | 0.0 | 0.6 | 0.3 | 1.3 | 0.0 | 0.3 | 11.1 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 47.3 | 0.0 | 36.0 | 33.8 | 0.0 | 39.0 | 15.3 | 5.4 | 0.0 | 10.1 | 22.5 | 11.8 |
| LnGrp LOS | D | A | D | C | A | D | B | A | A | B | C | B |
| Approach Vol, veh/h | | 385 | | | 53 | | | 1576 | | | 1534 | |
| Approach Delay, s/veh | | 44.8 | | | 36.5 | | | 5.6 | | | 21.7 | |
| Approach LOS | | D | | | D | | | A | | | C | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 9.0 | 51.3 | 11.0 | 18.7 | 9.0 | 51.2 | 16.0 | 13.7 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 5.0 | 29.0 | 5.0 | 27.0 | 5.0 | 29.0 | 10.0 | 22.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.9 | 2.0 | 3.1 | 6.2 | 2.9 | 32.1 | 12.0 | 3.5 | | | | |
| Green Ext Time (p_c), s | 0.0 | 12.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.1 | | | | |

Intersection Summary

HCM 6th Ctrl Delay 17.3
HCM 6th LOS B

Notes

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

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0.2 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | ↗ | ↘ | ↗↘ | ↗↘ | ↗ |
| Traffic Vol, veh/h | 0 | 30 | 14 | 1690 | 1382 | 52 |
| Future Vol, veh/h | 0 | 30 | 14 | 1690 | 1382 | 52 |
| 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 | 300 | - | - | 300 |
| 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 | 0 | 33 | 15 | 1837 | 1502 | 57 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - | 751 | 1559 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | - | 6.94 | 4.14 |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | - | 3.32 | 2.22 |
| Pot Cap-1 Maneuver | 0 | *502 | *751 |
| Stage 1 | 0 | - | - |
| Stage 2 | 0 | - | - |
| Platoon blocked, % | | 1 | 1 |
| Mov Cap-1 Maneuver | - | *502 | *751 |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |

| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 12.7 | 0.1 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h) | * 751 | - | 502 | - | - |
| HCM Lane V/C Ratio | 0.02 | - | 0.065 | - | - |
| HCM Control Delay (s) | 9.9 | - | 12.7 | - | - |
| HCM Lane LOS | A | - | B | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | 0.2 | - | - |

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

***Intersection Capacity Worksheets:
2050 Background +
Project***

| | → | ↘ | ↙ | ← | ↓ | ↗ |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Configurations | ↑↑↑ | ↑ | ↘↙ | ↑↑↑ | ↑ | ↗ |
| Traffic Volume (vph) | 1696 | 260 | 335 | 2651 | 5 | 250 |
| Future Volume (vph) | 1696 | 260 | 335 | 2651 | 5 | 250 |
| Turn Type | NA | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 3 | 8 | 6 | |
| Permitted Phases | | 4 | 8 | | | 6 |
| Detector Phase | 4 | 4 | 3 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.0 | 25.0 | 10.0 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 48.0 | 48.0 | 14.0 | 62.0 | 28.0 | 28.0 |
| Total Split (%) | 53.3% | 53.3% | 15.6% | 68.9% | 31.1% | 31.1% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Max | C-Max | None | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90

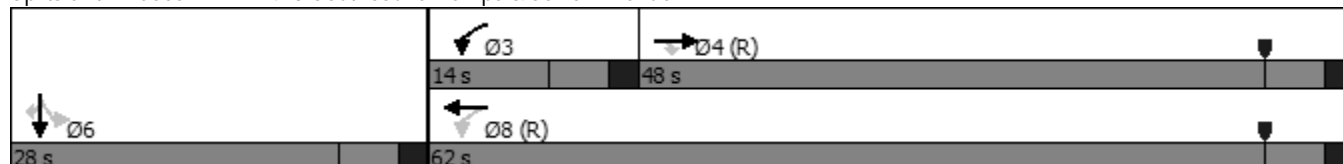
Actuated Cycle Length: 90







Offset: 68 (76%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 1: E-470 Southbound Ramps & Jewell Avenue















| |  |  |  |  |  |  |
|-----------------------------|---|---|---|---|---|---|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Group Flow (vph) | 1731 | 265 | 342 | 2705 | 367 | 255 |
| v/c Ratio | 0.74 | 0.30 | 0.74 | 0.85 | 0.86 | 0.55 |
| Control Delay | 21.8 | 2.9 | 22.2 | 22.5 | 54.3 | 21.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay | 21.8 | 2.9 | 22.2 | 22.8 | 54.3 | 21.8 |
| Queue Length 50th (ft) | 282 | 0 | 81 | 443 | 200 | 70 |
| Queue Length 95th (ft) | 339 | 40 | m78 | m426 | #354 | 148 |
| Internal Link Dist (ft) | 679 | | | 530 | 532 | |
| Turn Bay Length (ft) | | 300 | 250 | | | |
| Base Capacity (vph) | 2353 | 874 | 465 | 3164 | 425 | 461 |
| Starvation Cap Reductn | 0 | 0 | 0 | 84 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.74 | 0.30 | 0.74 | 0.88 | 0.86 | 0.55 |
| Intersection Summary | | | | | | |
| # | 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. | | | | | |
| m | Volume for 95th percentile queue is metered by upstream signal. | | | | | |

HCM 6th Signalized Intersection Summary

11/22/2023


















1: E-470 Southbound Ramps & Jewell Avenue

2050 Bkgrd + Project - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↑↑↑ | ↗ | ↘↘ | ↑↑↑ | | | | | | ↖ | ↗ |
| Traffic Volume (veh/h) | 0 | 1696 | 260 | 335 | 2651 | 0 | 0 | 0 | 0 | 340 | 5 | 250 |
| Future Volume (veh/h) | 0 | 1696 | 260 | 335 | 2651 | 0 | 0 | 0 | 0 | 340 | 5 | 250 |
| Initial Q (Qb), veh | 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 |
| Parking Bus, Adj | 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 | |
| Adj Sat Flow, veh/h/ln | 0 | 1856 | 1856 | 1870 | 1870 | 0 | | | | 1841 | 1841 | 1841 |
| Adj Flow Rate, veh/h | 0 | 1731 | 265 | 342 | 2705 | 0 | | | | 362 | 5 | 0 |
| Peak Hour Factor | 0.92 | 0.98 | 0.98 | 0.98 | 0.98 | 0.92 | | | | 0.94 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 0 | 3 | 3 | 2 | 2 | 0 | | | | 4 | 4 | 4 |
| Cap, veh/h | 0 | 2446 | 759 | 501 | 3177 | 0 | | | | 423 | 6 | |
| Arrive On Green | 0.00 | 0.48 | 0.48 | 0.15 | 1.00 | 0.00 | | | | 0.24 | 0.24 | 0.00 |
| Sat Flow, veh/h | 0 | 5233 | 1572 | 3456 | 5274 | 0 | | | | 1730 | 24 | 1560 |
| Grp Volume(v), veh/h | 0 | 1731 | 265 | 342 | 2705 | 0 | | | | 367 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1689 | 1572 | 1728 | 1702 | 0 | | | | 1754 | 0 | 1560 |
| Q Serve(g_s), s | 0.0 | 24.2 | 9.4 | 4.3 | 0.0 | 0.0 | | | | 18.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 24.2 | 9.4 | 4.3 | 0.0 | 0.0 | | | | 18.0 | 0.0 | 0.0 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 0.00 | | | | 0.99 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 2446 | 759 | 501 | 3177 | 0 | | | | 429 | 0 | |
| V/C Ratio(X) | 0.00 | 0.71 | 0.35 | 0.68 | 0.85 | 0.00 | | | | 0.86 | 0.00 | |
| Avail Cap(c_a), veh/h | 0 | 2446 | 759 | 557 | 3177 | 0 | | | | 429 | 0 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.09 | 0.09 | 0.00 | | | | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 18.3 | 14.5 | 16.3 | 0.0 | 0.0 | | | | 32.5 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 1.8 | 1.3 | 0.3 | 0.3 | 0.0 | | | | 19.2 | 0.0 | 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 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 8.6 | 3.2 | 1.4 | 0.1 | 0.0 | | | | 9.7 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 20.0 | 15.7 | 16.6 | 0.3 | 0.0 | | | | 51.7 | 0.0 | 0.0 |
| LnGrp LOS | A | C | B | B | A | A | | | | D | A | |
| Approach Vol, veh/h | | 1996 | | | 3047 | | | | | | 367 | |
| Approach Delay, s/veh | | 19.5 | | | 2.1 | | | | | | 51.7 | |
| Approach LOS | | B | | | A | | | | | | D | |
| Timer - Assigned Phs | | | 3 | 4 | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | | | 12.5 | 49.5 | | 28.0 | | 62.0 | | | | |
| Change Period (Y+Rc), s | | | 6.0 | 6.0 | | 6.0 | | 6.0 | | | | |
| Max Green Setting (Gmax), s | | | 8.0 | 42.0 | | 22.0 | | 56.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | | 6.3 | 26.2 | | 20.0 | | 2.0 | | | | |
| Green Ext Time (p_c), s | | | 0.2 | 10.9 | | 0.5 | | 39.7 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 11.9 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

Notes

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

| |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
| Lane Configurations |   |    |    |  |  |  |
| Traffic Volume (vph) | 280 | 1756 | 2636 | 471 | 0 | 310 |
| Future Volume (vph) | 280 | 1756 | 2636 | 471 | 0 | 310 |
| Turn Type | pm+pt | NA | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 8 | | 2 | |
| Permitted Phases | 4 | | | 8 | | 2 |
| Detector Phase | 7 | 4 | 8 | 8 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 3.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.5 | 25.0 | 25.0 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 11.0 | 63.0 | 52.0 | 52.0 | 27.0 | 27.0 |
| Total Split (%) | 12.2% | 70.0% | 57.8% | 57.8% | 30.0% | 30.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Recall Mode | None | C-Max | C-Max | C-Max | Max | Max |

Intersection Summary

Cycle Length: 90





Actuated Cycle Length: 90

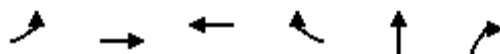
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 2: E-470 Northbound Ramps & Jewell Avenue

| | | |
|---|---|---|
|  Ø2 |  Ø4 (R) | |
| 27 s | 63 s | |
| |  Ø7 |  Ø8 (R) |
| | 11 s | 52 s |



| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
|-------------------------|------|------|------|------|------|------|
| Lane Group Flow (vph) | 286 | 1792 | 2690 | 481 | 357 | 316 |
| v/c Ratio | 0.85 | 0.58 | 1.06 | 0.48 | 0.86 | 0.70 |
| Control Delay | 42.4 | 3.8 | 57.7 | 3.6 | 55.5 | 29.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.4 | 3.8 | 57.7 | 3.6 | 55.5 | 29.8 |
| Queue Length 50th (ft) | 35 | 45 | ~619 | 11 | 196 | 107 |
| Queue Length 95th (ft) | m#77 | 54 | #714 | 60 | #350 | 203 |
| Internal Link Dist (ft) | | 530 | 2523 | | 717 | |
| Turn Bay Length (ft) | 250 | | | | | 175 |
| Base Capacity (vph) | 338 | 3098 | 2549 | 1008 | 413 | 452 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.85 | 0.58 | 1.06 | 0.48 | 0.86 | 0.70 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.



















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

HCM 6th Signalized Intersection Summary

2: E-470 Northbound Ramps & Jewell Avenue

11/22/2023

2050 Bkgrd + Project - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | | |  |  | |  |  | | | |
| Traffic Volume (veh/h) | 280 | 1756 | 0 | 0 | 2636 | 471 | 350 | 0 | 310 | 0 | 0 | 0 |
| Future Volume (veh/h) | 280 | 1756 | 0 | 0 | 2636 | 471 | 350 | 0 | 310 | 0 | 0 | 0 |
| Initial Q (Qb), veh | 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 | | | |
| Parking Bus, Adj | 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 | | | | | |
| Adj Sat Flow, veh/h/ln | 1811 | 1811 | 0 | 0 | 1841 | 1841 | 1870 | 1870 | 1870 | | | |
| Adj Flow Rate, veh/h | 286 | 1792 | 0 | 0 | 2690 | 481 | 357 | 0 | 0 | | | |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | | | |
| Percent Heavy Veh, % | 6 | 6 | 0 | 0 | 4 | 4 | 2 | 2 | 2 | | | |
| Cap, veh/h | 346 | 3131 | 0 | 0 | 2568 | 797 | 416 | 0 | | | | |
| Arrive On Green | 0.11 | 1.00 | 0.00 | 0.00 | 0.51 | 0.51 | 0.23 | 0.00 | 0.00 | | | |
| Sat Flow, veh/h | 3346 | 5107 | 0 | 0 | 5191 | 1560 | 1781 | 0 | 1585 | | | |
| Grp Volume(v), veh/h | 286 | 1792 | 0 | 0 | 2690 | 481 | 357 | 0 | 0 | | | |
| Grp Sat Flow(s),veh/h/ln | 1673 | 1648 | 0 | 0 | 1675 | 1560 | 1781 | 0 | 1585 | | | |
| Q Serve(g_s), s | 3.6 | 0.0 | 0.0 | 0.0 | 46.0 | 19.6 | 17.3 | 0.0 | 0.0 | | | |
| Cycle Q Clear(g_c), s | 3.6 | 0.0 | 0.0 | 0.0 | 46.0 | 19.6 | 17.3 | 0.0 | 0.0 | | | |
| Prop In Lane | 1.00 | | 0.00 | 0.00 | | 1.00 | 1.00 | | 1.00 | | | |
| Lane Grp Cap(c), veh/h | 346 | 3131 | 0 | 0 | 2568 | 797 | 416 | 0 | | | | |
| V/C Ratio(X) | 0.83 | 0.57 | 0.00 | 0.00 | 1.05 | 0.60 | 0.86 | 0.00 | | | | |
| Avail Cap(c_a), veh/h | 346 | 3131 | 0 | 0 | 2568 | 797 | 416 | 0 | | | | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | |
| Upstream Filter(I) | 0.60 | 0.60 | 0.00 | 0.00 | 0.09 | 0.09 | 1.00 | 0.00 | 0.00 | | | |
| Uniform Delay (d), s/veh | 19.9 | 0.0 | 0.0 | 0.0 | 22.0 | 15.6 | 33.1 | 0.0 | 0.0 | | | |
| Incr Delay (d2), s/veh | 9.7 | 0.5 | 0.0 | 0.0 | 22.6 | 0.3 | 20.0 | 0.0 | 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 | | | |
| %ile BackOfQ(50%),veh/ln | 1.8 | 0.1 | 0.0 | 0.0 | 20.5 | 6.1 | 9.6 | 0.0 | 0.0 | | | |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 29.6 | 0.5 | 0.0 | 0.0 | 44.6 | 15.9 | 53.1 | 0.0 | 0.0 | | | |
| LnGrp LOS | C | A | A | A | F | B | D | A | | | | |
| Approach Vol, veh/h | 2078 | | | 3171 | | | 357 | | | | | |
| Approach Delay, s/veh | 4.5 | | | 40.3 | | | 53.1 | | | | | |
| Approach LOS | A | | | D | | | D | | | | | |
| Timer - Assigned Phs | 2 | | | 4 | | | 7 | | | 8 | | |
| Phs Duration (G+Y+Rc), s | 27.0 | | | 63.0 | | | 11.0 | | | 52.0 | | |
| Change Period (Y+Rc), s | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | | |
| Max Green Setting (Gmax), s | 21.0 | | | 57.0 | | | 5.0 | | | 46.0 | | |
| Max Q Clear Time (g_c+I1), s | 19.3 | | | 2.0 | | | 5.6 | | | 48.0 | | |
| Green Ext Time (p_c), s | 0.4 | | | 20.3 | | | 0.0 | | | 0.0 | | |

Intersection Summary

| | |
|--------------------|------|
| HCM 6th Ctrl Delay | 27.8 |
| HCM 6th LOS | C |

























Notes

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

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

Timings
11/22/2023

3: Gun Club Road & Jewell Avenue
2050 Bkgrd + Project - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 365 | 1110 | 591 | 520 | 2355 | 505 | 442 | 1595 | 341 | 285 | 1080 | 310 |
| Future Volume (vph) | 365 | 1110 | 591 | 520 | 2355 | 505 | 442 | 1595 | 341 | 285 | 1080 | 310 |
| Turn Type | Prot | NA | Free | Prot | NA | pm+ov | Prot | NA | Free | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | 7 |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 8.0 | | 3.0 | 8.0 | 4.0 | 5.0 | 8.0 | | 4.0 | 8.0 | 3.0 |
| Minimum Split (s) | 9.5 | 40.0 | | 9.5 | 40.0 | 9.5 | 9.5 | 40.0 | | 9.5 | 29.0 | 9.5 |
| Total Split (s) | 14.2 | 48.8 | | 34.2 | 68.8 | 16.0 | 24.2 | 51.0 | | 16.0 | 42.8 | 14.2 |
| Total Split (%) | 9.5% | 32.5% | | 22.8% | 45.9% | 10.7% | 16.1% | 34.0% | | 10.7% | 28.5% | 9.5% |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 | 3.5 | 4.0 | | 3.0 | 4.0 | 3.0 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 | | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 6.0 | | 5.0 | 6.0 | 5.0 | 4.5 | 6.0 | | 5.0 | 6.0 | 5.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lead | Lag | | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | C-Max | | None | C-Max | None |

Intersection Summary

Cycle Length: 150









Actuated Cycle Length: 150













Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 150

Control Type: Actuated-Coordinated

Splits and Phases: 3: Gun Club Road & Jewell Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 16 s | 51 s | 34.2 s | 48.8 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 24.2 s | 42.8 s | 14.2 s | 68.8 s |

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 372 | 1133 | 603 | 531 | 2403 | 515 | 451 | 1628 | 348 | 291 | 1102 | 316 |
| v/c Ratio | 1.84 | 0.75 | 0.40 | 0.92 | 1.15 | 0.59 | 1.01 | 1.08 | 0.22 | 1.21 | 0.93 | 0.52 |
| Control Delay | 432.9 | 51.1 | 0.8 | 82.3 | 113.7 | 22.6 | 108.8 | 96.4 | 0.3 | 183.2 | 68.8 | 26.0 |
| 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 | 432.9 | 51.1 | 0.8 | 82.3 | 113.7 | 22.6 | 108.8 | 96.4 | 0.3 | 183.2 | 68.8 | 26.0 |
| Queue Length 50th (ft) | ~282 | 369 | 0 | 264 | ~1009 | 277 | ~234 | ~648 | 0 | ~178 | 389 | 146 |
| Queue Length 95th (ft) | #389 | 438 | 0 | 327 | #1095 | 396 | #352 | #745 | 0 | #277 | #474 | 244 |
| Internal Link Dist (ft) | | 2523 | | | 1479 | | | 1470 | | | 790 | |
| Turn Bay Length (ft) | 420 | | 330 | 300 | | 565 | 485 | | 300 | 200 | | 325 |
| Base Capacity (vph) | 202 | 1505 | 1524 | 655 | 2088 | 868 | 446 | 1510 | 1568 | 240 | 1189 | 606 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.84 | 0.75 | 0.40 | 0.81 | 1.15 | 0.59 | 1.01 | 1.08 | 0.22 | 1.21 | 0.93 | 0.52 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

























Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary

11/22/2023

3: Gun Club Road & Jewell Avenue

2050 Bkgrd + Project - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 365 | 1110 | 591 | 520 | 2355 | 505 | 442 | 1595 | 341 | 285 | 1080 | 310 |
| Future Volume (veh/h) | 365 | 1110 | 591 | 520 | 2355 | 505 | 442 | 1595 | 341 | 285 | 1080 | 310 |
| 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 | 1811 | 1811 | 1811 | 1841 | 1841 | 1841 | 1856 | 1856 | 1856 | 1796 | 1796 | 1796 |
| Adj Flow Rate, veh/h | 372 | 1133 | 0 | 531 | 2403 | 515 | 451 | 1628 | 0 | 291 | 1102 | 316 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 6 | 6 | 6 | 4 | 4 | 4 | 3 | 3 | 3 | 7 | 7 | 7 |
| Cap, veh/h | 205 | 1544 | | 570 | 2104 | 767 | 450 | 1520 | | 243 | 1203 | 467 |
| Arrive On Green | 0.06 | 0.31 | 0.00 | 0.17 | 0.42 | 0.42 | 0.13 | 0.30 | 0.00 | 0.07 | 0.25 | 0.25 |
| Sat Flow, veh/h | 3346 | 4944 | 1535 | 3401 | 5025 | 1560 | 3428 | 5066 | 1572 | 3319 | 4904 | 1522 |
| Grp Volume(v), veh/h | 372 | 1133 | 0 | 531 | 2403 | 515 | 451 | 1628 | 0 | 291 | 1102 | 316 |
| Grp Sat Flow(s),veh/h/ln | 1673 | 1648 | 1535 | 1700 | 1675 | 1560 | 1714 | 1689 | 1572 | 1659 | 1635 | 1522 |
| Q Serve(g_s), s | 9.2 | 30.7 | 0.0 | 23.1 | 62.8 | 37.6 | 19.7 | 45.0 | 0.0 | 11.0 | 32.8 | 27.2 |
| Cycle Q Clear(g_c), s | 9.2 | 30.7 | 0.0 | 23.1 | 62.8 | 37.6 | 19.7 | 45.0 | 0.0 | 11.0 | 32.8 | 27.2 |
| 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 | 205 | 1544 | | 570 | 2104 | 767 | 450 | 1520 | | 243 | 1203 | 467 |
| V/C Ratio(X) | 1.81 | 0.73 | | 0.93 | 1.14 | 0.67 | 1.00 | 1.07 | | 1.20 | 0.92 | 0.68 |
| Avail Cap(c_a), veh/h | 205 | 1544 | | 662 | 2104 | 767 | 450 | 1520 | | 243 | 1203 | 467 |
| 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) | 0.77 | 0.77 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 70.4 | 46.0 | 0.0 | 61.6 | 43.6 | 28.9 | 65.1 | 52.5 | 0.0 | 69.5 | 55.1 | 45.5 |
| Incr Delay (d2), s/veh | 380.1 | 2.2 | 0.0 | 17.4 | 70.2 | 4.0 | 42.8 | 44.8 | 0.0 | 121.0 | 12.3 | 7.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 14.7 | 12.6 | 0.0 | 11.2 | 38.6 | 14.4 | 11.0 | 24.5 | 0.0 | 8.6 | 14.4 | 11.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 450.5 | 48.2 | 0.0 | 79.0 | 113.8 | 32.9 | 108.0 | 97.3 | 0.0 | 190.5 | 67.4 | 53.2 |
| LnGrp LOS | F | D | | E | F | C | F | F | | F | E | D |
| Approach Vol, veh/h | | 1505 | | | 3449 | | | 2079 | | | 1709 | |
| Approach Delay, s/veh | | 147.6 | | | 96.4 | | | 99.6 | | | 85.7 | |
| Approach LOS | | F | | | F | | | F | | | F | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 16.0 | 51.0 | 30.2 | 52.8 | 24.2 | 42.8 | 14.2 | 68.8 | | | | |
| Change Period (Y+Rc), s | 5.0 | 6.0 | 5.0 | 6.0 | 4.5 | 6.0 | 5.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 11.0 | 45.0 | 29.2 | 42.8 | 19.7 | 36.8 | 9.2 | 62.8 | | | | |
| Max Q Clear Time (g_c+I1), s | 13.0 | 47.0 | 25.1 | 32.7 | 21.7 | 34.8 | 11.2 | 64.8 | | | | |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.1 | 7.9 | 0.0 | 1.8 | 0.0 | 0.0 | | | | |

Intersection Summary

HCM 6th Ctrl Delay 103.9

HCM 6th LOS F

Notes

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





















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

| Intersection | | | | | | |
|----------------------------|--------|------------------------|-------|----------------------------|------|--------------------------------|
| Int Delay, s/veh | 0.2 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | ↗ | ↘ | ↑↑↑ | ↑↑↑ | ↗ |
| Traffic Vol, veh/h | 0 | 10 | 69 | 2399 | 1780 | 100 |
| Future Vol, veh/h | 0 | 10 | 69 | 2399 | 1780 | 100 |
| 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 | 250 | - | - | 250 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 98 | 98 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 11 | 75 | 2448 | 1816 | 109 |
| | | | | | | |
| Major/Minor | Minor2 | Major1 | | Major2 | | |
| Conflicting Flow All | - | 908 | 1925 | 0 | - | 0 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | 7.14 | 5.34 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | 3.92 | 3.12 | - | - | - |
| Pot Cap-1 Maneuver | 0 | *511 | *643 | - | - | - |
| Stage 1 | 0 | - | - | - | - | - |
| Stage 2 | 0 | - | - | - | - | - |
| Platoon blocked, % | | 1 | 1 | - | - | - |
| Mov Cap-1 Maneuver | - | *511 | *643 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| | | | | | | |
| | | | | | | |
| Approach | EB | NB | | SB | | |
| HCM Control Delay, s | 12.2 | 0.3 | | 0 | | |
| HCM LOS | B | | | | | |
| | | | | | | |
| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR | |
| Capacity (veh/h) | * 643 | - | 511 | - | - | |
| HCM Lane V/C Ratio | 0.117 | - | 0.021 | - | - | |
| HCM Control Delay (s) | 11.3 | - | 12.2 | - | - | |
| HCM Lane LOS | B | - | B | - | - | |
| HCM 95th %tile Q(veh) | 0.4 | - | 0.1 | - | - | |
| Notes | | | | | | |
| ~: Volume exceeds capacity | | \$: Delay exceeds 300s | | +: Computation Not Defined | | *: All major volume in platoon |

Timings
11/22/2023

102: Gun Club Road & Yale Avenue

2050 Bkgrd + Project - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 50 | 5 | 340 | 5 | 108 | 2208 | 150 | 300 | 1365 | 125 |
| Future Volume (vph) | 50 | 5 | 340 | 5 | 108 | 2208 | 150 | 300 | 1365 | 125 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 33.0 | 11.0 | 33.0 | 11.0 | 30.0 | 30.0 | 11.0 | 30.0 | 30.0 |
| Total Split (s) | 11.0 | 33.0 | 11.0 | 33.0 | 15.0 | 59.0 | 59.0 | 17.0 | 61.0 | 61.0 |
| Total Split (%) | 9.2% | 27.5% | 9.2% | 27.5% | 12.5% | 49.2% | 49.2% | 14.2% | 50.8% | 50.8% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | Max | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120









Actuated Cycle Length: 120











Offset: 53 (44%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 105

Control Type: Actuated-Coordinated

Splits and Phases: 102: Gun Club Road & Yale Avenue

| | | | |
|---|---|--|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 17 s | 59 s | 11 s | 33 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 15 s | 61 s | 11 s | 33 s |

| |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 54 | 18 | 370 | 233 | 117 | 2253 | 163 | 326 | 1393 | 136 |
| v/c Ratio | 0.31 | 0.08 | 0.43 | 0.43 | 0.54 | 0.99 | 0.21 | 0.76 | 0.59 | 0.17 |
| Control Delay | 43.1 | 21.9 | 36.2 | 10.6 | 22.3 | 50.9 | 5.7 | 34.6 | 25.1 | 3.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 43.1 | 21.9 | 36.2 | 10.6 | 22.3 | 50.9 | 5.7 | 34.6 | 25.1 | 3.6 |
| Queue Length 50th (ft) | 42 | 4 | 112 | 19 | 38 | ~632 | 12 | 72 | 288 | 0 |
| Queue Length 95th (ft) | 61 | 23 | 155 | 90 | 70 | #761 | 52 | 123 | 336 | 35 |
| Internal Link Dist (ft) | | 816 | | 845 | | 4562 | | | 1641 | |
| Turn Bay Length (ft) | 150 | | | | 250 | | 250 | 250 | | 250 |
| Base Capacity (vph) | 176 | 384 | 865 | 539 | 227 | 2267 | 781 | 443 | 2359 | 807 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.31 | 0.05 | 0.43 | 0.43 | 0.52 | 0.99 | 0.21 | 0.74 | 0.59 | 0.17 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.























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

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary

11/22/2023

102: Gun Club Road & Yale Avenue
2050 Bkgrd + Project - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  | |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 50 | 5 | 12 | 340 | 5 | 210 | 108 | 2208 | 150 | 300 | 1365 | 125 |
| Future Volume (veh/h) | 50 | 5 | 12 | 340 | 5 | 210 | 108 | 2208 | 150 | 300 | 1365 | 125 |
| 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 | 54 | 5 | 0 | 370 | 5 | 0 | 117 | 2253 | 163 | 326 | 1393 | 136 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.98 | 0.92 | 0.92 | 0.98 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 430 | 408 | | 855 | 421 | | 251 | 2385 | 740 | 386 | 2503 | 777 |
| Arrive On Green | 0.03 | 0.22 | 0.00 | 0.04 | 0.22 | 0.00 | 0.05 | 0.47 | 0.47 | 0.07 | 0.49 | 0.49 |
| Sat Flow, veh/h | 1781 | 1870 | 0 | 3456 | 1870 | 0 | 1781 | 5106 | 1585 | 3456 | 5106 | 1585 |
| Grp Volume(v), veh/h | 54 | 5 | 0 | 370 | 5 | 0 | 117 | 2253 | 163 | 326 | 1393 | 136 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1870 | 0 | 1728 | 1870 | 0 | 1781 | 1702 | 1585 | 1728 | 1702 | 1585 |
| Q Serve(g_s), s | 2.8 | 0.3 | 0.0 | 5.0 | 0.2 | 0.0 | 4.1 | 50.5 | 7.3 | 6.5 | 23.0 | 5.7 |
| Cycle Q Clear(g_c), s | 2.8 | 0.3 | 0.0 | 5.0 | 0.2 | 0.0 | 4.1 | 50.5 | 7.3 | 6.5 | 23.0 | 5.7 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 430 | 408 | | 855 | 421 | | 251 | 2385 | 740 | 386 | 2503 | 777 |
| V/C Ratio(X) | 0.13 | 0.01 | | 0.43 | 0.01 | | 0.47 | 0.94 | 0.22 | 0.85 | 0.56 | 0.18 |
| Avail Cap(c_a), veh/h | 442 | 421 | | 855 | 421 | | 295 | 2385 | 740 | 450 | 2503 | 777 |
| 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 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.5 | 36.8 | 0.0 | 37.3 | 36.1 | 0.0 | 17.6 | 30.5 | 19.0 | 30.6 | 21.4 | 17.1 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.0 | 0.3 | 0.1 | 0.0 | 1.3 | 9.4 | 0.7 | 12.4 | 0.9 | 0.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.2 | 0.1 | 0.0 | 2.2 | 0.1 | 0.0 | 1.6 | 20.6 | 2.8 | 3.1 | 8.5 | 2.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 34.7 | 36.8 | 0.0 | 37.6 | 36.2 | 0.0 | 18.9 | 39.9 | 19.7 | 43.0 | 22.3 | 17.6 |
| LnGrp LOS | C | D | | D | D | | B | D | B | D | C | B |
| Approach Vol, veh/h | | 59 | | | 375 | | | 2533 | | | 1855 | |
| Approach Delay, s/veh | | 34.8 | | | 37.6 | | | 37.6 | | | 25.6 | |
| Approach LOS | | C | | | D | | | D | | | C | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 14.8 | 62.1 | 11.0 | 32.2 | 12.0 | 64.8 | 10.2 | 33.0 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 11.0 | 53.0 | 5.0 | 27.0 | 9.0 | 55.0 | 5.0 | 27.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 8.5 | 52.5 | 7.0 | 2.3 | 6.1 | 25.0 | 4.8 | 2.2 | | | | |
| Green Ext Time (p_c), s | 0.3 | 0.5 | 0.0 | 0.0 | 0.1 | 11.2 | 0.0 | 0.0 | | | | |

Intersection Summary























HCM 6th Ctrl Delay 33.0
HCM 6th LOS C

Notes

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

Timings
11/22/2023

103: Gun Club Road & Addison Avenue
2050 Bkgrd + Project - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 73 | 1 | 25 | 1 | 50 | 73 | 2276 | 50 | 80 | 1836 | 194 |
| Future Volume (vph) | 73 | 1 | 25 | 1 | 50 | 73 | 2276 | 50 | 80 | 1836 | 194 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 8 | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 38.0 | 11.0 | 38.0 | 38.0 | 11.0 | 28.0 | 28.0 | 11.0 | 28.0 | 28.0 |
| Total Split (s) | 11.0 | 38.0 | 38.0 | 38.0 | 38.0 | 11.0 | 28.0 | 28.0 | 11.0 | 28.0 | 28.0 |
| Total Split (%) | 9.6% | 33.0% | 33.0% | 33.0% | 33.0% | 9.6% | 24.3% | 24.3% | 9.6% | 24.3% | 24.3% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 115









Actuated Cycle Length: 115












Offset: 19 (17%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 110

Control Type: Actuated-Coordinated

Splits and Phases: 103: Gun Club Road & Addison Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 11 s | 28 s | 38 s | 38 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 11 s | 28 s | 11 s | 38 s |

| |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 79 | 22 | 27 | 1 | 54 | 79 | 2322 | 54 | 87 | 1873 | 211 |
| v/c Ratio | 0.53 | 0.14 | 0.14 | 0.01 | 0.21 | 0.39 | 0.71 | 0.05 | 0.46 | 0.54 | 0.19 |
| Control Delay | 58.2 | 22.9 | 40.4 | 47.0 | 1.8 | 13.3 | 17.4 | 0.1 | 21.1 | 13.4 | 2.3 |
| 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 | 58.2 | 22.9 | 40.4 | 47.0 | 1.8 | 13.3 | 17.4 | 0.1 | 21.1 | 13.4 | 2.3 |
| Queue Length 50th (ft) | ~62 | 1 | 17 | 1 | 0 | 14 | 416 | 0 | 16 | 285 | 3 |
| Queue Length 95th (ft) | 94 | 27 | 42 | 6 | 0 | 39 | 569 | 0 | 65 | 378 | 36 |
| Internal Link Dist (ft) | | 564 | | 1036 | | | 985 | | | 915 | |
| Turn Bay Length (ft) | 300 | | | | | 300 | | 300 | 300 | | 300 |
| Base Capacity (vph) | 150 | 459 | 492 | 955 | 881 | 201 | 3263 | 1086 | 189 | 3456 | 1139 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.53 | 0.05 | 0.05 | 0.00 | 0.06 | 0.39 | 0.71 | 0.05 | 0.46 | 0.54 | 0.19 |
























Intersection Summary

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

HCM 6th Signalized Intersection Summary

11/22/2023

103: Gun Club Road & Addison Avenue
2050 Bkgrd + Project - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 73 | 1 | 19 | 25 | 1 | 50 | 73 | 2276 | 50 | 80 | 1836 | 194 |
| Future Volume (veh/h) | 73 | 1 | 19 | 25 | 1 | 50 | 73 | 2276 | 50 | 80 | 1836 | 194 |
| 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 | 79 | 1 | 21 | 27 | 1 | 0 | 79 | 2322 | 54 | 87 | 1873 | 211 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.98 | 0.92 | 0.92 | 0.98 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 232 | 5 | 102 | 212 | 122 | | 220 | 3276 | 1017 | 186 | 3280 | 1018 |
| Arrive On Green | 0.04 | 0.07 | 0.07 | 0.04 | 0.07 | 0.00 | 0.04 | 0.64 | 0.64 | 0.04 | 0.64 | 0.64 |
| Sat Flow, veh/h | 1781 | 73 | 1524 | 1781 | 1870 | 1585 | 1781 | 5106 | 1585 | 1781 | 5106 | 1585 |
| Grp Volume(v), veh/h | 79 | 0 | 22 | 27 | 1 | 0 | 79 | 2322 | 54 | 87 | 1873 | 211 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1596 | 1781 | 1870 | 1585 | 1781 | 1702 | 1585 | 1781 | 1702 | 1585 |
| Q Serve(g_s), s | 4.8 | 0.0 | 1.5 | 1.6 | 0.1 | 0.0 | 1.7 | 34.4 | 1.5 | 1.9 | 23.8 | 6.3 |
| Cycle Q Clear(g_c), s | 4.8 | 0.0 | 1.5 | 1.6 | 0.1 | 0.0 | 1.7 | 34.4 | 1.5 | 1.9 | 23.8 | 6.3 |
| Prop In Lane | 1.00 | | 0.95 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 232 | 0 | 107 | 212 | 122 | | 220 | 3276 | 1017 | 186 | 3280 | 1018 |
| V/C Ratio(X) | 0.34 | 0.00 | 0.21 | 0.13 | 0.01 | | 0.36 | 0.71 | 0.05 | 0.47 | 0.57 | 0.21 |
| Avail Cap(c_a), veh/h | 232 | 0 | 444 | 633 | 520 | | 226 | 3276 | 1017 | 191 | 3280 | 1018 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 47.8 | 0.0 | 50.8 | 46.5 | 50.2 | 0.0 | 10.2 | 13.5 | 7.6 | 18.2 | 11.6 | 8.5 |
| Incr Delay (d2), s/veh | 0.9 | 0.0 | 0.9 | 0.3 | 0.0 | 0.0 | 1.0 | 1.3 | 0.1 | 1.8 | 0.7 | 0.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 0.0 | 0.6 | 0.7 | 0.0 | 0.0 | 0.6 | 11.0 | 0.5 | 1.3 | 7.6 | 2.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 48.6 | 0.0 | 51.7 | 46.8 | 50.3 | 0.0 | 11.2 | 14.9 | 7.7 | 20.1 | 12.3 | 8.9 |
| LnGrp LOS | D | A | D | D | D | | B | B | A | C | B | A |
| Approach Vol, veh/h | 101 | | | | 28 | | | | 2455 | | | |
| Approach Delay, s/veh | 49.3 | | | | 46.9 | | | | 14.6 | | | |
| Approach LOS | D | | | | D | | | | B | | | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 10.7 | 79.8 | 10.8 | 13.7 | 10.6 | 79.9 | 11.0 | 13.5 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 5.0 | 22.0 | 32.0 | 32.0 | 5.0 | 22.0 | 5.0 | 32.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.9 | 36.4 | 3.6 | 3.5 | 3.7 | 25.8 | 6.8 | 2.1 | | | | |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | | | | |

Intersection Summary

HCM 6th Ctrl Delay 14.5
HCM 6th LOS B

Notes

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

Intersection

Int Delay, s/veh 0.3

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations | | ↗ | ↘ | ↑↑↑ | ↑↑↑ | ↗ |
| Traffic Vol, veh/h | 0 | 6 | 21 | 2378 | 2104 | 87 |
| Future Vol, veh/h | 0 | 6 | 21 | 2378 | 2104 | 87 |
| 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 | 300 | - | - | 300 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 98 | 98 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 7 | 23 | 2427 | 2147 | 95 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - 1074 | 2242 | 0 - 0 |
| Stage 1 | - - | - | - - - |
| Stage 2 | - - | - | - - - |
| Critical Hdwy | - 7.14 | 5.34 | - - - |
| Critical Hdwy Stg 1 | - - | - | - - - |
| Critical Hdwy Stg 2 | - - | - | - - - |
| Follow-up Hdwy | - 3.92 | 3.12 | - - - |
| Pot Cap-1 Maneuver | 0 185 | 94 | - - - |
| Stage 1 | 0 - | - | - - - |
| Stage 2 | 0 - | - | - - - |
| Platoon blocked, % | | | - - - |
| Mov Cap-1 Maneuver | - 185 | 94 | - - - |
| Mov Cap-2 Maneuver | - - | - | - - - |
| Stage 1 | - - | - | - - - |
| Stage 2 | - - | - | - - - |

| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 25.2 | 0.5 | 0 |
| HCM LOS | D | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h) | 94 | - | 185 | - | - |
| HCM Lane V/C Ratio | 0.243 | - | 0.035 | - | - |
| HCM Control Delay (s) | 55.2 | - | 25.2 | - | - |
| HCM Lane LOS | F | - | D | - | - |
| HCM 95th %tile Q(veh) | 0.9 | - | 0.1 | - | - |

| | → | ↘ | ↙ | ← | ↓ | ↗ |
|----------------------|-------|-------|-------|-------|-------|-------|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Configurations | ↑↑↑ | ↑ | ↘↙ | ↑↑↑ | ↑ | ↗ |
| Traffic Volume (vph) | 2710 | 330 | 382 | 1903 | 5 | 355 |
| Future Volume (vph) | 2710 | 330 | 382 | 1903 | 5 | 355 |
| Turn Type | NA | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 3 | 8 | 6 | |
| Permitted Phases | | 4 | 8 | | | 6 |
| Detector Phase | 4 | 4 | 3 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 4.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.0 | 25.0 | 12.5 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 60.0 | 60.0 | 14.0 | 74.0 | 36.0 | 36.0 |
| Total Split (%) | 54.5% | 54.5% | 12.7% | 67.3% | 32.7% | 32.7% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Max | C-Max | None | C-Max | None | None |

Intersection Summary

Cycle Length: 110

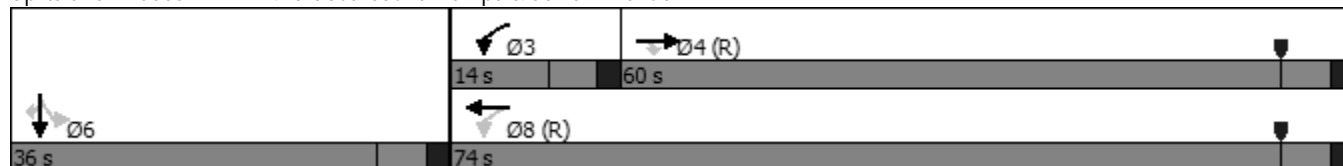
Actuated Cycle Length: 110







Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Splits and Phases: 1: E-470 Southbound Ramps & Jewell Avenue

































| |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| Lane Group | EBT | EBR | WBL | WBT | SBT | SBR |
| Lane Group Flow (vph) | 2765 | 337 | 390 | 1942 | 273 | 362 |
| v/c Ratio | 1.08 | 0.36 | 0.82 | 0.58 | 0.69 | 0.86 |
| Control Delay | 70.0 | 4.6 | 49.1 | 7.2 | 47.7 | 50.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Total Delay | 70.0 | 4.6 | 49.1 | 7.3 | 47.7 | 50.2 |
| Queue Length 50th (ft) | ~818 | 21 | 118 | 119 | 172 | 184 |
| Queue Length 95th (ft) | #909 | 72 | m#139 | m164 | 256 | #303 |
| Internal Link Dist (ft) | 679 | | | 530 | 532 | |
| Turn Bay Length (ft) | | 300 | 250 | | | |
| Base Capacity (vph) | 2570 | 937 | 474 | 3356 | 465 | 480 |
| Starvation Cap Reductn | 0 | 0 | 0 | 234 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.08 | 0.36 | 0.82 | 0.62 | 0.59 | 0.75 |
| Intersection Summary | | | | | | |
| ~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. | | | | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. | | | | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | | | | |

HCM 6th Signalized Intersection Summary

1: E-470 Southbound Ramps & Jewell Avenue

2050 Bkgrd + Project - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|--|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | | ↑↑↑ | ↗ | ↘↘ | ↑↑↑ | | | | | | ↖ | ↗ |
| Traffic Volume (veh/h) | 0 | 2710 | 330 | 382 | 1903 | 0 | 0 | 0 | 0 | 263 | 5 | 355 |
| Future Volume (veh/h) | 0 | 2710 | 330 | 382 | 1903 | 0 | 0 | 0 | 0 | 263 | 5 | 355 |
| Initial Q (Qb), veh | 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 |
| Parking Bus, Adj | 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 | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 1870 | 1870 | 0 | | | | 1811 | 1811 | 1811 |
| Adj Flow Rate, veh/h | 0 | 2765 | 337 | 390 | 1942 | 0 | | | | 268 | 5 | 0 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | | | | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 0 | | | | 6 | 6 | 6 |
| Cap, veh/h | 0 | 2968 | 921 | 394 | 3618 | 0 | | | | 309 | 6 | |
| Arrive On Green | 0.00 | 0.58 | 0.58 | 0.15 | 1.00 | 0.00 | | | | 0.18 | 0.18 | 0.00 |
| Sat Flow, veh/h | 0 | 5274 | 1585 | 3456 | 5274 | 0 | | | | 1695 | 32 | 1535 |
| Grp Volume(v), veh/h | 0 | 2765 | 337 | 390 | 1942 | 0 | | | | 273 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1702 | 1585 | 1728 | 1702 | 0 | | | | 1726 | 0 | 1535 |
| Q Serve(g_s), s | 0.0 | 54.4 | 12.4 | 7.8 | 0.0 | 0.0 | | | | 16.9 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 54.4 | 12.4 | 7.8 | 0.0 | 0.0 | | | | 16.9 | 0.0 | 0.0 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 0.00 | | | | 0.98 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 2968 | 921 | 394 | 3618 | 0 | | | | 315 | 0 | |
| V/C Ratio(X) | 0.00 | 0.93 | 0.37 | 0.99 | 0.54 | 0.00 | | | | 0.87 | 0.00 | |
| Avail Cap(c_a), veh/h | 0 | 2968 | 921 | 394 | 3618 | 0 | | | | 471 | 0 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.25 | 0.25 | 0.00 | | | | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 21.0 | 12.2 | 32.1 | 0.0 | 0.0 | | | | 43.7 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 6.8 | 1.1 | 20.1 | 0.1 | 0.0 | | | | 10.8 | 0.0 | 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 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 20.4 | 4.2 | 5.8 | 0.0 | 0.0 | | | | 8.1 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 0.0 | 27.8 | 13.4 | 52.2 | 0.1 | 0.0 | | | | 54.4 | 0.0 | 0.0 |
| LnGrp LOS | A | C | B | D | A | A | | | | D | A | |
| Approach Vol, veh/h | | 3102 | | | 2332 | | | | | | 273 | |
| Approach Delay, s/veh | | 26.2 | | | 8.8 | | | | | | 54.4 | |
| Approach LOS | | C | | | A | | | | | | D | |
| Timer - Assigned Phs | | | 3 | 4 | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | | | 14.0 | 69.9 | | 26.1 | | 83.9 | | | | |
| Change Period (Y+Rc), s | | | 6.0 | 6.0 | | 6.0 | | 6.0 | | | | |
| Max Green Setting (Gmax), s | | | 8.0 | 54.0 | | 30.0 | | 68.0 | | | | |
| Max Q Clear Time (g_c+I1), s | | | 9.8 | 56.4 | | 18.9 | | 2.0 | | | | |
| Green Ext Time (p_c), s | | | 0.0 | 0.0 | | 1.2 | | 24.8 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 20.5 | | | | | | | | | |
| HCM 6th LOS | | | C | | | | | | | | | |
| Notes | | | | | | | | | | | | |
| Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay. | | | | | | | | | | | | |

| |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
| Lane Configurations |   |    |    |  |   |  |
| Traffic Volume (vph) | 275 | 2698 | 2010 | 386 | 0 | 390 |
| Future Volume (vph) | 275 | 2698 | 2010 | 386 | 0 | 390 |
| Turn Type | pm+pt | NA | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | 8 | | 2 | |
| Permitted Phases | 4 | | | 8 | | 2 |
| Detector Phase | 7 | 4 | 8 | 8 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 3.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.5 | 25.0 | 25.0 | 25.0 | 27.0 | 27.0 |
| Total Split (s) | 13.0 | 69.0 | 56.0 | 56.0 | 41.0 | 41.0 |
| Total Split (%) | 11.8% | 62.7% | 50.9% | 50.9% | 37.3% | 37.3% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Recall Mode | None | C-Max | C-Max | C-Max | Max | Max |

Intersection Summary

Cycle Length: 110





Actuated Cycle Length: 110







Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 2: E-470 Northbound Ramps & Jewell Avenue

| | |
|---|---|
|  Ø2 |  Ø4 (R) |
| 41 s | 69 s |
| |  Ø7 |
| |  Ø8 (R) |
| | 13 s 56 s |



















| |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBT | WBR | NBT | NBR |
| Lane Group Flow (vph) | 281 | 2753 | 2051 | 394 | 281 | 398 |
| v/c Ratio | 0.82 | 0.96 | 0.93 | 0.45 | 0.51 | 0.72 |
| Control Delay | 39.4 | 14.2 | 37.4 | 5.0 | 34.6 | 34.2 |
| Queue Delay | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 39.4 | 16.5 | 37.4 | 5.0 | 34.6 | 34.2 |
| Queue Length 50th (ft) | 70 | 202 | 487 | 19 | 161 | 195 |
| Queue Length 95th (ft) | m67 | m176 | #579 | 80 | 246 | 314 |
| Internal Link Dist (ft) | | 530 | 2523 | | 717 | |
| Turn Bay Length (ft) | 250 | | | | | 175 |
| Base Capacity (vph) | 342 | 2856 | 2203 | 874 | 546 | 550 |
| Starvation Cap Reductn | 0 | 59 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.82 | 0.98 | 0.93 | 0.45 | 0.51 | 0.72 |
| Intersection Summary | | | | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. | | | | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | | | | |

HCM 6th Signalized Intersection Summary

2: E-470 Northbound Ramps & Jewell Avenue

11/22/2023

2050 Bkgrd + Project - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | | |  |  | |  |  | | | |
| Traffic Volume (veh/h) | 275 | 2698 | 0 | 0 | 2010 | 386 | 275 | 0 | 390 | 0 | 0 | 0 |
| Future Volume (veh/h) | 275 | 2698 | 0 | 0 | 2010 | 386 | 275 | 0 | 390 | 0 | 0 | 0 |
| Initial Q (Qb), veh | 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 | | | |
| Parking Bus, Adj | 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 | | | | | |
| Adj Sat Flow, veh/h/ln | 1841 | 1841 | 0 | 0 | 1796 | 1796 | 1826 | 1826 | 1826 | | | |
| Adj Flow Rate, veh/h | 281 | 2753 | 0 | 0 | 2051 | 394 | 281 | 0 | 0 | | | |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | | | |
| Percent Heavy Veh, % | 4 | 4 | 0 | 0 | 7 | 7 | 5 | 5 | 5 | | | |
| Cap, veh/h | 357 | 2878 | 0 | 0 | 2240 | 695 | 553 | 0 | | | | |
| Arrive On Green | 0.12 | 1.00 | 0.00 | 0.00 | 0.46 | 0.46 | 0.32 | 0.00 | 0.00 | | | |
| Sat Flow, veh/h | 3401 | 5191 | 0 | 0 | 5065 | 1522 | 1739 | 0 | 1547 | | | |
| Grp Volume(v), veh/h | 281 | 2753 | 0 | 0 | 2051 | 394 | 281 | 0 | 0 | | | |
| Grp Sat Flow(s),veh/h/ln | 1700 | 1675 | 0 | 0 | 1635 | 1522 | 1739 | 0 | 1547 | | | |
| Q Serve(g_s), s | 4.7 | 0.0 | 0.0 | 0.0 | 43.0 | 20.9 | 14.5 | 0.0 | 0.0 | | | |
| Cycle Q Clear(g_c), s | 4.7 | 0.0 | 0.0 | 0.0 | 43.0 | 20.9 | 14.5 | 0.0 | 0.0 | | | |
| Prop In Lane | 1.00 | | 0.00 | 0.00 | | 1.00 | 1.00 | | 1.00 | | | |
| Lane Grp Cap(c), veh/h | 357 | 2878 | 0 | 0 | 2240 | 695 | 553 | 0 | | | | |
| V/C Ratio(X) | 0.79 | 0.96 | 0.00 | 0.00 | 0.92 | 0.57 | 0.51 | 0.00 | | | | |
| Avail Cap(c_a), veh/h | 365 | 2878 | 0 | 0 | 2240 | 695 | 553 | 0 | | | | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | |
| Upstream Filter(I) | 0.09 | 0.09 | 0.00 | 0.00 | 0.09 | 0.09 | 1.00 | 0.00 | 0.00 | | | |
| Uniform Delay (d), s/veh | 23.4 | 0.0 | 0.0 | 0.0 | 27.9 | 21.9 | 30.5 | 0.0 | 0.0 | | | |
| Incr Delay (d2), s/veh | 1.1 | 1.2 | 0.0 | 0.0 | 0.8 | 0.3 | 3.3 | 0.0 | 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 | | | |
| %ile BackOfQ(50%),veh/ln | 1.6 | 0.3 | 0.0 | 0.0 | 15.5 | 7.0 | 6.5 | 0.0 | 0.0 | | | |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 24.5 | 1.2 | 0.0 | 0.0 | 28.7 | 22.2 | 33.8 | 0.0 | 0.0 | | | |
| LnGrp LOS | C | A | A | A | C | C | C | A | | | | |
| Approach Vol, veh/h | 3034 | | | 2445 | | | 281 | | | | | |
| Approach Delay, s/veh | 3.3 | | | 27.6 | | | 33.8 | | | | | |
| Approach LOS | A | | | C | | | C | | | | | |
| Timer - Assigned Phs | 2 | | | 4 | | | 7 | | | 8 | | |
| Phs Duration (G+Y+Rc), s | 41.0 | | | 69.0 | | | 12.7 | | | 56.3 | | |
| Change Period (Y+Rc), s | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | | |
| Max Green Setting (Gmax), s | 35.0 | | | 63.0 | | | 7.0 | | | 50.0 | | |
| Max Q Clear Time (g_c+I1), s | 16.5 | | | 2.0 | | | 6.7 | | | 45.0 | | |
| Green Ext Time (p_c), s | 1.6 | | | 44.5 | | | 0.0 | | | 4.5 | | |

Intersection Summary

HCM 6th Ctrl Delay 15.1

HCM 6th LOS B

























Notes

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

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

Timings
11/22/2023

3: Gun Club Road & Jewell Avenue
2050 Bkgrd + Project - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 495 | 2205 | 388 | 485 | 1705 | 470 | 441 | 1371 | 533 | 505 | 1566 | 250 |
| Future Volume (vph) | 495 | 2205 | 388 | 485 | 1705 | 470 | 441 | 1371 | 533 | 505 | 1566 | 250 |
| Turn Type | Prot | NA | Free | Prot | NA | pm+ov | Prot | NA | Free | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | 7 |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 4.0 | | 3.0 | 5.0 | 4.0 | 4.0 | 8.0 | | 4.0 | 8.0 | 3.0 |
| Minimum Split (s) | 9.5 | 32.0 | | 9.5 | 32.0 | 9.5 | 9.5 | 40.0 | | 9.5 | 29.0 | 9.5 |
| Total Split (s) | 26.8 | 64.0 | | 16.0 | 53.2 | 22.0 | 21.0 | 48.0 | | 22.0 | 49.0 | 26.8 |
| Total Split (%) | 17.9% | 42.7% | | 10.7% | 35.5% | 14.7% | 14.0% | 32.0% | | 14.7% | 32.7% | 17.9% |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 4.0 | | 3.0 | 4.0 | 3.0 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 6.0 | | 5.0 | 6.0 | 5.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lead | Lag | | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | C-Max | | None | C-Max | None |

Intersection Summary

Cycle Length: 150









Actuated Cycle Length: 150













Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 145

Control Type: Actuated-Coordinated

Splits and Phases: 3: Gun Club Road & Jewell Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 22 s | 48 s | 16 s | 64 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 21 s | 49 s | 26.8 s | 53.2 s |

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 505 | 2250 | 396 | 495 | 1740 | 480 | 450 | 1399 | 544 | 515 | 1598 | 255 |
| v/c Ratio | 1.03 | 1.15 | 0.25 | 2.01 | 1.09 | 0.62 | 1.29 | 1.03 | 0.36 | 1.31 | 1.09 | 0.33 |
| Control Delay | 110.5 | 114.1 | 0.4 | 501.8 | 97.1 | 27.5 | 200.7 | 84.9 | 0.7 | 207.7 | 99.9 | 20.7 |
| 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 | 110.5 | 114.1 | 0.4 | 501.8 | 97.1 | 27.5 | 200.7 | 84.9 | 0.7 | 207.7 | 99.9 | 20.7 |
| Queue Length 50th (ft) | ~272 | ~942 | 0 | ~388 | ~697 | 280 | ~288 | ~535 | 0 | ~332 | ~640 | 121 |
| Queue Length 95th (ft) | #389 | #1031 | 0 | #505 | #792 | 404 | #402 | #632 | 0 | #451 | #736 | 189 |
| Internal Link Dist (ft) | | 2523 | | | 1479 | | | 1470 | | | 790 | |
| Turn Bay Length (ft) | 420 | | 330 | 300 | | 565 | 485 | | 300 | 200 | | 325 |
| Base Capacity (vph) | 489 | 1961 | 1553 | 246 | 1602 | 777 | 349 | 1357 | 1509 | 392 | 1472 | 781 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.03 | 1.15 | 0.25 | 2.01 | 1.09 | 0.62 | 1.29 | 1.03 | 0.36 | 1.31 | 1.09 | 0.33 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

























Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary

11/22/2023

3: Gun Club Road & Jewell Avenue

2050 Bkgrd + Project - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 495 | 2205 | 388 | 485 | 1705 | 470 | 441 | 1371 | 533 | 505 | 1566 | 250 |
| Future Volume (veh/h) | 495 | 2205 | 388 | 485 | 1705 | 470 | 441 | 1371 | 533 | 505 | 1566 | 250 |
| 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 | 1841 | 1841 | 1841 | 1841 | 1841 | 1841 | 1796 | 1796 | 1796 | 1885 | 1885 | 1885 |
| Adj Flow Rate, veh/h | 505 | 2250 | 0 | 495 | 1740 | 480 | 450 | 1399 | 0 | 515 | 1598 | 255 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 1 | 1 | 1 |
| Cap, veh/h | 494 | 1977 | | 249 | 1615 | 678 | 354 | 1373 | | 395 | 1475 | 690 |
| Arrive On Green | 0.15 | 0.39 | 0.00 | 0.07 | 0.32 | 0.32 | 0.11 | 0.28 | 0.00 | 0.11 | 0.29 | 0.29 |
| Sat Flow, veh/h | 3401 | 5025 | 1560 | 3401 | 5025 | 1560 | 3319 | 4904 | 1522 | 3483 | 5147 | 1598 |
| Grp Volume(v), veh/h | 505 | 2250 | 0 | 495 | 1740 | 480 | 450 | 1399 | 0 | 515 | 1598 | 255 |
| Grp Sat Flow(s),veh/h/ln | 1700 | 1675 | 1560 | 1700 | 1675 | 1560 | 1659 | 1635 | 1522 | 1742 | 1716 | 1598 |
| Q Serve(g_s), s | 21.8 | 59.0 | 0.0 | 11.0 | 48.2 | 37.7 | 16.0 | 42.0 | 0.0 | 17.0 | 43.0 | 16.2 |
| Cycle Q Clear(g_c), s | 21.8 | 59.0 | 0.0 | 11.0 | 48.2 | 37.7 | 16.0 | 42.0 | 0.0 | 17.0 | 43.0 | 16.2 |
| 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 | 494 | 1977 | | 249 | 1615 | 678 | 354 | 1373 | | 395 | 1475 | 690 |
| V/C Ratio(X) | 1.02 | 1.14 | | 1.98 | 1.08 | 0.71 | 1.27 | 1.02 | | 1.30 | 1.08 | 0.37 |
| Avail Cap(c_a), veh/h | 494 | 1977 | | 249 | 1615 | 678 | 354 | 1373 | | 395 | 1475 | 690 |
| 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) | 0.24 | 0.24 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 64.1 | 45.5 | 0.0 | 69.5 | 50.9 | 34.6 | 67.0 | 54.0 | 0.0 | 66.5 | 53.5 | 28.8 |
| Incr Delay (d2), s/veh | 25.5 | 64.0 | 0.0 | 457.2 | 46.5 | 3.4 | 142.4 | 29.1 | 0.0 | 154.4 | 49.4 | 1.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.0 | 35.3 | 0.0 | 20.5 | 26.6 | 14.5 | 13.6 | 20.2 | 0.0 | 15.8 | 24.5 | 6.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 89.6 | 109.5 | 0.0 | 526.7 | 97.4 | 38.0 | 209.4 | 83.1 | 0.0 | 220.9 | 102.9 | 30.3 |
| LnGrp LOS | F | F | | F | F | D | F | F | | F | F | C |
| Approach Vol, veh/h | 2755 | | | 2715 | | | 1849 | | | 2368 | | |
| Approach Delay, s/veh | 105.9 | | | 165.2 | | | 113.9 | | | 120.8 | | |
| Approach LOS | F | | | F | | | F | | | F | | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 22.0 | 48.0 | 16.0 | 64.0 | 21.0 | 49.0 | 26.8 | 53.2 | | | | |
| 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 | 17.0 | 42.0 | 11.0 | 59.0 | 16.0 | 43.0 | 21.8 | 48.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 19.0 | 44.0 | 13.0 | 61.0 | 18.0 | 45.0 | 23.8 | 50.2 | | | | |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | |

Intersection Summary






HCM 6th Ctrl Delay 127.7

HCM 6th LOS F

Notes



























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

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

| Intersection | | | | | | |
|----------------------------|--------|---|---|---|---|---|
| Int Delay, s/veh | 0.2 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | |  |  |  |  |  |
| Traffic Vol, veh/h | 0 | 37 | 10 | 2060 | 2373 | 15 |
| Future Vol, veh/h | 0 | 37 | 10 | 2060 | 2373 | 15 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | 250 | - | - | 250 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 98 | 98 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 40 | 11 | 2102 | 2421 | 16 |
| | | | | | | |
| Major/Minor | Minor2 | Major1 | | Major2 | | |
| Conflicting Flow All | - | 1211 | 2437 | 0 | - | 0 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | 7.14 | 5.34 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | 3.92 | 3.12 | - | - | - |
| Pot Cap-1 Maneuver | 0 | *378 | *476 | - | - | - |
| Stage 1 | 0 | - | - | - | - | - |
| Stage 2 | 0 | - | - | - | - | - |
| Platoon blocked, % | | 1 | 1 | - | - | - |
| Mov Cap-1 Maneuver | - | *378 | *476 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| | | | | | | |
| | | | | | | |
| Approach | EB | NB | | SB | | |
| HCM Control Delay, s | 15.7 | 0.1 | | 0 | | |
| HCM LOS | C | | | | | |
| | | | | | | |
| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR | |
| Capacity (veh/h) | * 476 | - | 378 | - | - | |
| HCM Lane V/C Ratio | 0.023 | - | 0.106 | - | - | |
| HCM Control Delay (s) | 12.7 | - | 15.7 | - | - | |
| HCM Lane LOS | B | - | C | - | - | |
| HCM 95th %tile Q(veh) | 0.1 | - | 0.4 | - | - | |
| Notes | | | | | | |
| ~: Volume exceeds capacity | | \$: Delay exceeds 300s | | +: Computation Not Defined | | *: All major volume in platoon |

Timings
11/22/2023

102: Gun Club Road & Yale Avenue
2050 Bkgrd + Project - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |   |  |  |    |  |   |    |  |
| Traffic Volume (vph) | 305 | 5 | 460 | 5 | 17 | 1445 | 325 | 450 | 1940 | 20 |
| Future Volume (vph) | 305 | 5 | 460 | 5 | 17 | 1445 | 325 | 450 | 1940 | 20 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 33.0 | 11.0 | 33.0 | 11.0 | 30.0 | 30.0 | 11.0 | 30.0 | 30.0 |
| Total Split (s) | 21.0 | 37.0 | 17.0 | 33.0 | 11.0 | 46.0 | 46.0 | 20.0 | 55.0 | 55.0 |
| Total Split (%) | 17.5% | 30.8% | 14.2% | 27.5% | 9.2% | 38.3% | 38.3% | 16.7% | 45.8% | 45.8% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | Max | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120


Actuated Cycle Length: 120











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

Natural Cycle: 105

Control Type: Actuated-Coordinated

Splits and Phases: 102: Gun Club Road & Yale Avenue























| | | | |
|--|--|--|--|
|  Ø1 |  Ø2 (R) |  Ø3 |  Ø4 |
| 20 s | 46 s | 17 s | 37 s |
|  Ø5 |  Ø6 (R) |  Ø7 |  Ø8 |
| 11 s | 55 s | 21 s | 33 s |

| |  |  |  |  |  |  |  |  |  |  |
|-----------------------------|---|---|---|---|---|---|--|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 332 | 83 | 500 | 353 | 18 | 1474 | 353 | 489 | 1980 | 22 |
| v/c Ratio | 1.03 | 0.20 | 0.54 | 0.72 | 0.13 | 0.87 | 0.48 | 0.93 | 0.84 | 0.03 |
| Control Delay | 91.1 | 9.8 | 29.8 | 31.1 | 18.4 | 44.3 | 6.8 | 70.1 | 30.6 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 91.1 | 9.8 | 29.8 | 31.1 | 18.4 | 44.3 | 6.8 | 70.1 | 30.6 | 0.1 |
| Queue Length 50th (ft) | 188 | 3 | 138 | 132 | 7 | 390 | 15 | 175 | 306 | 0 |
| Queue Length 95th (ft) | #333 | 43 | 182 | 246 | 19 | 455 | 87 | m#248 | #635 | m0 |
| Internal Link Dist (ft) | | 816 | | 845 | | 4562 | | | 1641 | |
| Turn Bay Length (ft) | 150 | | | | 250 | | 250 | 250 | | 250 |
| Base Capacity (vph) | 322 | 471 | 928 | 489 | 137 | 1695 | 743 | 523 | 2356 | 806 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.03 | 0.18 | 0.54 | 0.72 | 0.13 | 0.87 | 0.48 | 0.93 | 0.84 | 0.03 |
| Intersection Summary | | | | | | | | | | |
| # | 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. | | | | | | | | | |
| m | Volume for 95th percentile queue is metered by upstream signal. | | | | | | | | | |

HCM 6th Signalized Intersection Summary

11/22/2023

102: Gun Club Road & Yale Avenue
2050 Bkgrd + Project - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  | |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 305 | 5 | 72 | 460 | 5 | 320 | 17 | 1445 | 325 | 450 | 1940 | 20 |
| Future Volume (veh/h) | 305 | 5 | 72 | 460 | 5 | 320 | 17 | 1445 | 325 | 450 | 1940 | 20 |
| 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 | 332 | 5 | 0 | 500 | 5 | 0 | 18 | 1474 | 353 | 489 | 1980 | 22 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.98 | 0.92 | 0.92 | 0.98 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 597 | 483 | | 1053 | 421 | | 113 | 1729 | 537 | 540 | 2202 | 683 |
| Arrive On Green | 0.13 | 0.26 | 0.00 | 0.09 | 0.22 | 0.00 | 0.02 | 0.34 | 0.34 | 0.15 | 0.57 | 0.57 |
| Sat Flow, veh/h | 1781 | 1870 | 0 | 3456 | 1870 | 0 | 1781 | 5106 | 1585 | 3456 | 5106 | 1585 |
| Grp Volume(v), veh/h | 332 | 5 | 0 | 500 | 5 | 0 | 18 | 1474 | 353 | 489 | 1980 | 22 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1870 | 0 | 1728 | 1870 | 0 | 1781 | 1702 | 1585 | 1728 | 1702 | 1585 |
| Q Serve(g_s), s | 15.0 | 0.2 | 0.0 | 11.0 | 0.2 | 0.0 | 0.8 | 32.2 | 22.7 | 11.2 | 41.0 | 0.7 |
| Cycle Q Clear(g_c), s | 15.0 | 0.2 | 0.0 | 11.0 | 0.2 | 0.0 | 0.8 | 32.2 | 22.7 | 11.2 | 41.0 | 0.7 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 597 | 483 | | 1053 | 421 | | 113 | 1729 | 537 | 540 | 2202 | 683 |
| V/C Ratio(X) | 0.56 | 0.01 | | 0.47 | 0.01 | | 0.16 | 0.85 | 0.66 | 0.91 | 0.90 | 0.03 |
| Avail Cap(c_a), veh/h | 597 | 483 | | 1053 | 421 | | 153 | 1729 | 537 | 558 | 2202 | 683 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.2 | 33.1 | 0.0 | 32.8 | 36.1 | 0.0 | 29.1 | 36.9 | 33.8 | 27.9 | 23.3 | 14.7 |
| Incr Delay (d2), s/veh | 1.1 | 0.0 | 0.0 | 0.3 | 0.1 | 0.0 | 0.7 | 5.6 | 6.2 | 18.1 | 6.4 | 0.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.9 | 0.1 | 0.0 | 5.9 | 0.1 | 0.0 | 0.3 | 13.3 | 9.6 | 5.3 | 13.4 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 32.4 | 33.1 | 0.0 | 33.2 | 36.2 | 0.0 | 29.7 | 42.5 | 40.0 | 46.0 | 29.7 | 14.8 |
| LnGrp LOS | C | C | | C | D | | C | D | D | D | C | B |
| Approach Vol, veh/h | | 337 | | | 505 | | | 1845 | | | 2491 | |
| Approach Delay, s/veh | | 32.4 | | | 33.2 | | | 41.9 | | | 32.8 | |
| Approach LOS | | C | | | C | | | D | | | C | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 19.4 | 46.6 | 17.0 | 37.0 | 8.3 | 57.7 | 21.0 | 33.0 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 14.0 | 40.0 | 11.0 | 31.0 | 5.0 | 49.0 | 15.0 | 27.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 13.2 | 34.2 | 13.0 | 2.2 | 2.8 | 43.0 | 17.0 | 2.2 | | | | |
| Green Ext Time (p_c), s | 0.2 | 4.3 | 0.0 | 0.0 | 0.0 | 5.0 | 0.0 | 0.0 | | | | |

Intersection Summary























HCM 6th Ctrl Delay 36.0
HCM 6th LOS D

Notes

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

Timings
11/22/2023

103: Gun Club Road & Addison Avenue
2050 Bkgrd + Project - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 278 | 3 | 88 | 3 | 103 | 34 | 1978 | 48 | 128 | 2226 | 63 |
| Future Volume (vph) | 278 | 3 | 88 | 3 | 103 | 34 | 1978 | 48 | 128 | 2226 | 63 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 8 | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 38.0 | 11.0 | 38.0 | 38.0 | 11.0 | 28.0 | 28.0 | 11.0 | 28.0 | 28.0 |
| Total Split (s) | 25.0 | 39.0 | 14.0 | 28.0 | 28.0 | 11.0 | 55.0 | 55.0 | 12.0 | 56.0 | 56.0 |
| Total Split (%) | 20.8% | 32.5% | 11.7% | 23.3% | 23.3% | 9.2% | 45.8% | 45.8% | 10.0% | 46.7% | 46.7% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | Max | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120







Actuated Cycle Length: 120












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

Natural Cycle: 110

Control Type: Actuated-Coordinated

Splits and Phases: 103: Gun Club Road & Addison Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 12 s | 55 s | 14 s | 39 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 11 s | 56 s | 25 s | 28 s |

| |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 302 | 83 | 96 | 3 | 112 | 37 | 2018 | 52 | 139 | 2271 | 68 |
| v/c Ratio | 0.80 | 0.23 | 0.48 | 0.02 | 0.40 | 0.23 | 0.85 | 0.06 | 0.56 | 0.80 | 0.07 |
| Control Delay | 55.0 | 12.1 | 43.5 | 53.0 | 4.1 | 21.1 | 50.3 | 0.6 | 28.2 | 24.8 | 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 |
| Total Delay | 55.0 | 12.1 | 43.5 | 53.0 | 4.1 | 21.1 | 50.3 | 0.6 | 28.2 | 24.8 | 0.1 |
| Queue Length 50th (ft) | 205 | 2 | 57 | 2 | 0 | 19 | 541 | 0 | 49 | 536 | 0 |
| Queue Length 95th (ft) | #337 | 48 | 103 | 13 | 0 | m22 | m589 | m0 | 116 | 623 | 0 |
| Internal Link Dist (ft) | | 564 | | 1036 | | | 985 | | | 915 | |
| Turn Bay Length (ft) | 300 | | | | | 300 | | 300 | 300 | | 300 |
| Base Capacity (vph) | 379 | 496 | 205 | 341 | 446 | 158 | 2388 | 844 | 249 | 2848 | 971 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.80 | 0.17 | 0.47 | 0.01 | 0.25 | 0.23 | 0.85 | 0.06 | 0.56 | 0.80 | 0.07 |

Intersection Summary

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
























Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary

11/22/2023

103: Gun Club Road & Addison Avenue
2050 Bkgrd + Project - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 278 | 3 | 74 | 88 | 3 | 103 | 34 | 1978 | 48 | 128 | 2226 | 63 |
| Future Volume (veh/h) | 278 | 3 | 74 | 88 | 3 | 103 | 34 | 1978 | 48 | 128 | 2226 | 63 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 302 | 3 | 80 | 96 | 3 | 0 | 37 | 2018 | 52 | 139 | 2271 | 68 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.98 | 0.92 | 0.92 | 0.98 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 434 | 9 | 244 | 265 | 124 | | 141 | 2681 | 832 | 204 | 2786 | 865 |
| Arrive On Green | 0.16 | 0.16 | 0.16 | 0.07 | 0.07 | 0.00 | 0.04 | 0.70 | 0.70 | 0.05 | 0.55 | 0.55 |
| Sat Flow, veh/h | 1781 | 58 | 1536 | 1781 | 1870 | 1585 | 1781 | 5106 | 1585 | 1781 | 5106 | 1585 |
| Grp Volume(v), veh/h | 302 | 0 | 83 | 96 | 3 | 0 | 37 | 2018 | 52 | 139 | 2271 | 68 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1594 | 1781 | 1870 | 1585 | 1781 | 1702 | 1585 | 1781 | 1702 | 1585 |
| Q Serve(g_s), s | 18.6 | 0.0 | 5.5 | 5.9 | 0.2 | 0.0 | 1.1 | 30.1 | 1.2 | 4.3 | 43.7 | 2.4 |
| Cycle Q Clear(g_c), s | 18.6 | 0.0 | 5.5 | 5.9 | 0.2 | 0.0 | 1.1 | 30.1 | 1.2 | 4.3 | 43.7 | 2.4 |
| Prop In Lane | 1.00 | | 0.96 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 434 | 0 | 253 | 265 | 124 | | 141 | 2681 | 832 | 204 | 2786 | 865 |
| V/C Ratio(X) | 0.70 | 0.00 | 0.33 | 0.36 | 0.02 | | 0.26 | 0.75 | 0.06 | 0.68 | 0.82 | 0.08 |
| Avail Cap(c_a), veh/h | 434 | 0 | 438 | 266 | 343 | | 162 | 2681 | 832 | 204 | 2786 | 865 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 41.6 | 0.0 | 44.8 | 47.7 | 52.4 | 0.0 | 21.2 | 13.1 | 8.8 | 21.8 | 22.3 | 12.9 |
| Incr Delay (d2), s/veh | 8.9 | 0.0 | 0.7 | 0.8 | 0.1 | 0.0 | 1.0 | 2.0 | 0.1 | 8.9 | 2.8 | 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(50%),veh/ln | 9.2 | 0.0 | 2.3 | 2.7 | 0.1 | 0.0 | 0.4 | 7.2 | 0.5 | 2.4 | 15.9 | 0.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 50.5 | 0.0 | 45.5 | 48.5 | 52.4 | 0.0 | 22.2 | 15.1 | 8.9 | 30.6 | 25.1 | 13.1 |
| LnGrp LOS | D | A | D | D | D | | C | B | A | C | C | B |
| Approach Vol, veh/h | | 385 | | | 99 | | | 2107 | | | 2478 | |
| Approach Delay, s/veh | | 49.4 | | | 48.7 | | | 15.1 | | | 25.1 | |
| Approach LOS | | D | | | D | | | B | | | C | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 12.0 | 69.0 | 13.9 | 25.1 | 9.5 | 71.5 | 25.0 | 14.0 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 6.0 | 49.0 | 8.0 | 33.0 | 5.0 | 50.0 | 19.0 | 22.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 6.3 | 32.1 | 7.9 | 7.5 | 3.1 | 45.7 | 20.6 | 2.2 | | | | |
| Green Ext Time (p_c), s | 0.0 | 11.9 | 0.0 | 0.4 | 0.0 | 3.9 | 0.0 | 0.0 | | | | |

Intersection Summary

HCM 6th Ctrl Delay 23.2
HCM 6th LOS C

Notes

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

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

Intersection

Int Delay, s/veh 0.4

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations | | ↗ | ↘ | ↑↑↑ | ↑↑↑ | ↗ |
| Traffic Vol, veh/h | 0 | 30 | 14 | 2345 | 2387 | 52 |
| Future Vol, veh/h | 0 | 30 | 14 | 2345 | 2387 | 52 |
| 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 | 300 | - | - | 300 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 98 | 98 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 33 | 15 | 2393 | 2436 | 57 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - 1218 | 2493 | 0 - 0 |
| Stage 1 | - - | - | - - - |
| Stage 2 | - - | - | - - - |
| Critical Hdwy | - 7.14 | 5.34 | - - - |
| Critical Hdwy Stg 1 | - - | - | - - - |
| Critical Hdwy Stg 2 | - - | - | - - - |
| Follow-up Hdwy | - 3.92 | 3.12 | - - - |
| Pot Cap-1 Maneuver | 0 148 | 70 | - - - |
| Stage 1 | 0 - | - | - - - |
| Stage 2 | 0 - | - | - - - |
| Platoon blocked, % | | | - - - |
| Mov Cap-1 Maneuver | - 148 | 70 | - - - |
| Mov Cap-2 Maneuver | - - | - | - - - |
| Stage 1 | - - | - | - - - |
| Stage 2 | - - | - | - - - |

| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 36.1 | 0.4 | 0 |
| HCM LOS | E | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h) | 70 | - | 148 | - | - |
| HCM Lane V/C Ratio | 0.217 | - | 0.22 | - | - |
| HCM Control Delay (s) | 70.2 | - | 36.1 | - | - |
| HCM Lane LOS | F | - | E | - | - |
| HCM 95th %tile Q(veh) | 0.8 | - | 0.8 | - | - |

***Signal Warrant
Worksheets***

Intersection: Jewell Ave. at E-470 Southbound Ramps

Warrant 2: 4 Hour Analysis - 2023 Existing Volumes

| | Major | Minor* | | Warrant 2 (Figure 4C-2) |
|--------------|-----------------|---------------|-------------------------------|----------------------------|
| | Jewell Avenue | E-470 SB Ramp | | |
| Time of Day | Number of Lanes | | | |
| | 2 | 1 | | |
| 0:00 | | | | no |
| 1:00 | | | | no |
| 2:00 | | | | no |
| 3:00 | | | | no |
| 4:00 | 256 | 35 | | no |
| 5:00 | 603 | 82 | | no |
| 6:00 | 1,115 | 152 | | Yes |
| 7:00 | 1,507 | 206 | | Yes |
| 8:00 | 1,251 | 171 | | Yes |
| 9:00 | 919 | 126 | | Yes |
| 10:00 | | | Warrant is Met (yes/no) | no |
| 11:00 | | | | no |
| 12:00 | | | | no |
| 13:00 | | | | no |
| 14:00 | 1,173 | 193 | | Yes |
| 15:00 | 1,466 | 241 | | Yes |
| 16:00 | 1,629 | 268 | | Yes |
| 17:00 | 1,580 | 260 | | Yes |
| 18:00 | 1,205 | 198 | | Yes |
| 19:00 | 782 | 129 | | Yes |
| 20:00 | | | | no |
| 21:00 | | | | no |
| 22:00 | | | | no |
| 23:00 | | | | no |
| Total | 13,486 | 2,061 | 10 | Met |

*70% factor applied since posted speed limit is above 40mph. The minor volume for each hour represents the higher of either minor approach.

Intersection: Jewell Ave. at E-470 Northbound Ramps

Warrant 2: 4 Hour Analysis - 2023 Existing Volumes

| | Major | Minor* | | Warrant 2 (Figure 4C-2) |
|--------------|-----------------|---------------|-------------------------------|----------------------------|
| | Jewell Avenue | E-470 NB Ramp | | |
| Time of Day | Number of Lanes | | | |
| | 2 | 1 | | |
| 0:00 | | | | no |
| 1:00 | | | | no |
| 2:00 | | | | no |
| 3:00 | | | | no |
| 4:00 | 214 | 37 | | no |
| 5:00 | 504 | 87 | | no |
| 6:00 | 932 | 161 | | Yes |
| 7:00 | 1,260 | 218 | | Yes |
| 8:00 | 1,046 | 181 | | Yes |
| 9:00 | 769 | 133 | | Yes |
| 10:00 | | | Warrant is Met (yes/no) | no |
| 11:00 | | | | no |
| 12:00 | | | | no |
| 13:00 | | | | no |
| 14:00 | 969 | 120 | | Yes |
| 15:00 | 1,211 | 150 | | Yes |
| 16:00 | 1,346 | 167 | | Yes |
| 17:00 | 1,306 | 162 | | Yes |
| 18:00 | 996 | 124 | | Yes |
| 19:00 | 646 | 80 | | no |
| 20:00 | | | | no |
| 21:00 | | | | no |
| 22:00 | | | | no |
| 23:00 | | | | no |
| Total | 11,199 | 1,620 | 9 | Met |

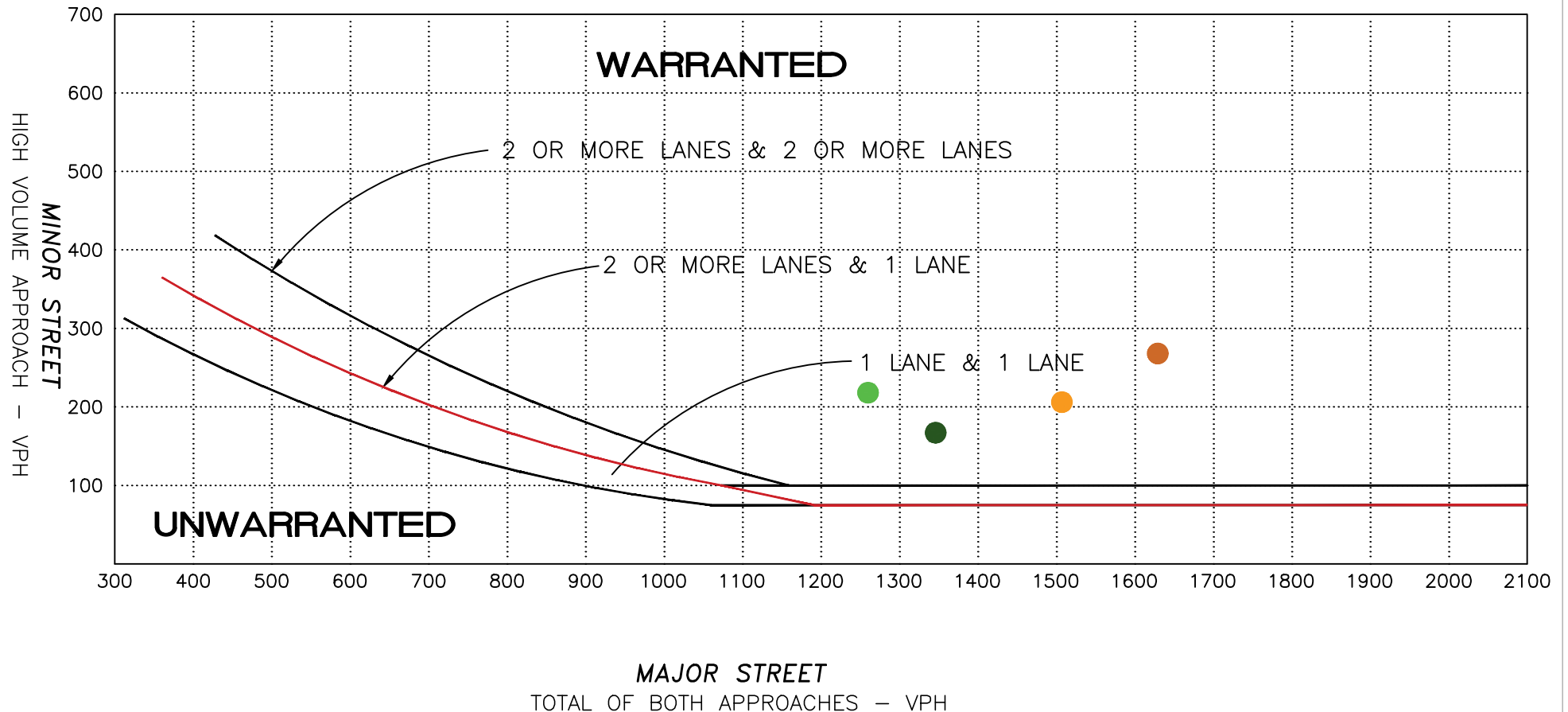
*70% factor applied since posted speed limit is above 40mph. The minor volume for each hour represents the higher of either minor approach.

PEAK HOUR VOLUME WARRANT (70%)

APPLIED FOR PLANNING PURPOSES

KEY FOR INTERSECTIONS

| MET | AM | PM | |
|-----|--------|-------------|---------------------------------|
| Yes | Orange | Dark Orange | E-470 Southbound Ramp: Existing |
| Yes | Green | Dark Green | E-470 Northbound Ramp: Existing |



NOTE: 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES
AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.



GUN CLUB BUSINESS PARK TRAFFIC IMPACT STUDY - AURORA, CO
PEAK HOUR SIGNAL WARRANT - JEWELL AVENUE AT E-470 RAMPS

| | | | | | | | | | |
|--------------|-------|----------------|-----|------|-----------|----------|-----|----------|------------|
| FT Project # | 23087 | Original Scale | NTS | Date | 3/14/2022 | Drawn by | CRS | Figure # | APPENDIX 1 |
|--------------|-------|----------------|-----|------|-----------|----------|-----|----------|------------|

Intersection: Gun Club Road at Yale Avenue

Warrant 2: 4 Hour Analysis - 2027 Background Volumes

| Day 1 | Major | Minor* | | Warrant 2 (Figure 4C-2) |
|--------------|-----------------|--------------|-------------------------------|----------------------------|
| | Gun Club Road | Yale Avenue | | |
| Time of Day | Number of Lanes | | | |
| | 2 | 2 | | |
| 0:00 | | | | no |
| 1:00 | | | | no |
| 2:00 | | | | no |
| 3:00 | | | | no |
| 4:00 | 369 | 17 | | no |
| 5:00 | 868 | 40 | | no |
| 6:00 | 1,606 | 74 | | Yes |
| 7:00 | 2,170 | 100 | | Yes |
| 8:00 | 1,801 | 83 | | Yes |
| 9:00 | 1,324 | 61 | | no |
| 10:00 | | | Warrant is Met (yes/no) | no |
| 11:00 | | | | no |
| 12:00 | | | | no |
| 13:00 | | | | no |
| 14:00 | 1,753 | 266 | | Yes |
| 15:00 | 2,192 | 333 | | Yes |
| 16:00 | 2,435 | 370 | | Yes |
| 17:00 | 2,362 | 359 | | Yes |
| 18:00 | 1,802 | 274 | | Yes |
| 19:00 | 1,169 | 178 | | Yes |
| 20:00 | | | | no |
| 21:00 | | | | no |
| 22:00 | | | | no |
| 23:00 | | | | no |
| Total | 19,851 | 2,155 | 9 | Met |

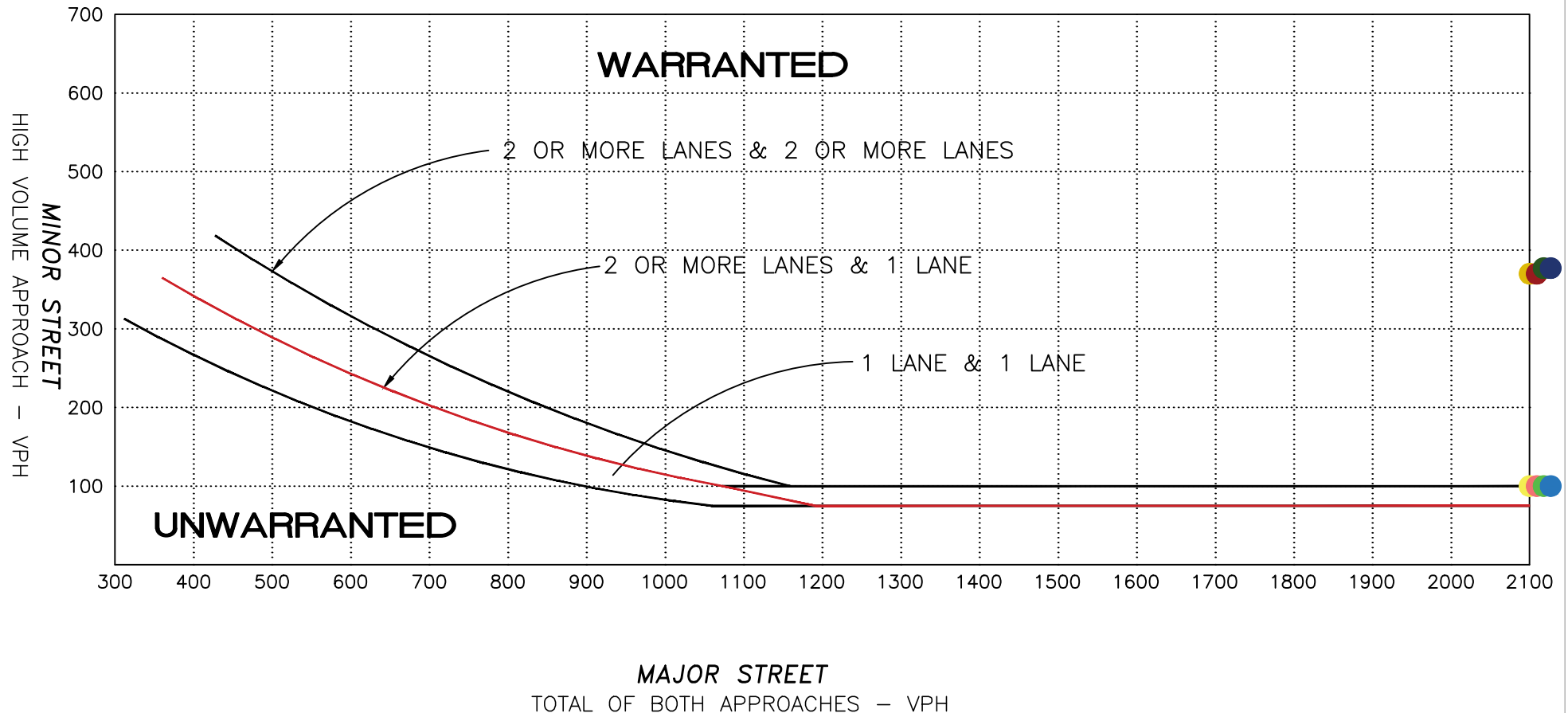
*70% factor applied since posted speed limit is above 40mph. The minor volume for each hour represents the higher of either minor approach.

PEAK HOUR VOLUME WARRANT (70%)

APPLIED FOR PLANNING PURPOSES

KEY FOR INTERSECTIONS

| MET | AM | PM | Year | Scenario |
|-----|--------|------------|------|-----------------|
| Yes | Yellow | Yellow | 2027 | Background |
| Yes | Pink | Red | 2050 | Background |
| Yes | Green | Dark Green | 2027 | Bkgrd + Project |
| Yes | Blue | Dark Blue | 2050 | Bkgrd + Project |



NOTE: 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES
AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.



GUN CLUB BUSINESS PARK TRAFFIC IMPACT STUDY - AURORA, CO
PEAK HOUR SIGNAL WARRANT - GUN CLUB ROAD AT YALE AVENUE

| | | | | | | | | | |
|--------------|-------|----------------|-----|------|------------|----------|-----|----------|------------|
| FT Project # | 23087 | Original Scale | NTS | Date | 11/17/2023 | Drawn by | CRS | Figure # | APPENDIX 2 |
|--------------|-------|----------------|-----|------|------------|----------|-----|----------|------------|

Intersection: Gun Club Road at Addison Avenue

Warrant 1: 8 Hour Analysis (70% Factor) - 2027 Background Volumes

| Day 1 | Major Gun Club Rd NB/SB | Minor* Addison Ave EB | Warrant Type Street Designation | Condition A Major Minor | | Condition B Major Minor | | Condition A + B Major A Minor A Major B Minor B | | | |
|-------------|-------------------------------|-----------------------------|--|----------------------------|---------|----------------------------|---------|--|---------|-----|-----|
| Time of Day | Number of Lanes | | Vehicles per Hour Needed to Meet Warrant | 420 | 105 | 630 | 53 | 336 | 84 | 504 | 42 |
| | 2 | 1 | | | | | | | | | |
| 0:00 | 112 | 0 | | no | no | no | no | no | no | no | no |
| 1:00 | 95 | 0 | | no | no | no | no | no | no | no | no |
| 2:00 | 122 | 0 | | no | no | no | no | no | no | no | no |
| 3:00 | 199 | 5 | | no | no | no | no | no | no | no | no |
| 4:00 | 374 | 5 | | no | no | no | no | yes | no | no | no |
| 5:00 | 860 | 15 | | yes | no | yes | no | yes | no | yes | no |
| 6:00 | 1,611 | 15 | | yes | no | yes | no | yes | no | yes | no |
| 7:00 | 2,339 | 19 | | yes | no | yes | no | yes | no | yes | no |
| 8:00 | 2,196 | 20 | | yes | no | yes | no | yes | no | yes | no |
| 9:00 | 1,318 | 20 | | yes | no | yes | no | yes | no | yes | no |
| 10:00 | 1,247 | 20 | Warrant is Met (yes/no) | yes | no | yes | no | yes | no | yes | no |
| 11:00 | 1,377 | 25 | | yes | no | yes | no | yes | no | yes | no |
| 12:00 | 1,398 | 26 | | yes | no | yes | no | yes | no | yes | no |
| 13:00 | 1,546 | 25 | | yes | no | yes | no | yes | no | yes | no |
| 14:00 | 1,812 | 29 | | yes | no | yes | no | yes | no | yes | no |
| 15:00 | 2,387 | 41 | | yes | no | yes | no | yes | no | yes | no |
| 16:00 | 2,545 | 47 | | yes | no | yes | no | yes | no | yes | yes |
| 17:00 | 2,500 | 49 | | yes | no | yes | no | yes | no | yes | yes |
| 18:00 | 1,738 | 44 | | yes | no | yes | no | yes | no | yes | yes |
| 19:00 | 1,143 | 35 | | yes | no | yes | no | yes | no | yes | no |
| 20:00 | 1,116 | 20 | | yes | no | yes | no | yes | no | yes | no |
| 21:00 | 758 | 15 | | yes | no | yes | no | yes | no | yes | no |
| 22:00 | 481 | 10 | | yes | no | no | no | yes | no | no | no |
| 23:00 | 305 | 5 | | no | no | no | no | no | no | no | no |
| Total | 29,579 | 490 | | 0 | Not Met | 0 | Not Met | 0 | Not Met | | |

* Vehicles per hour on higher-volume minor-street approach (one direction only)

Intersection: Gun Club Road at Addison Avenue

Warrant 1: 8 Hour Analysis (70% Factor) - 2027 Background Volumes

| Day 2 | Major Gun Club Rd NB / SB | Minor* Addison Ave WB | Warrant Type Street Designation | Condition A Major Minor | | Condition B Major Minor | | Condition A + B Major A Minor A Major B Minor B | | | |
|----------------|---------------------------------|-----------------------------|--|----------------------------|----------------|----------------------------|----------------|--|----------------|-----|-----|
| Time of Day | Number of Lanes | | Vehicles per Hour Needed to Meet Warrant | 420 | 105 | 630 | 53 | 336 | 84 | 504 | 42 |
| | 2 | 1 | | | | | | | | | |
| 0:00 | 171 | 0 | Warrant is Met (yes/no) | no | no | no | no | no | no | no | no |
| 1:00 | 106 | 0 | | no | no | no | no | no | no | no | no |
| 2:00 | 134 | 0 | | no | no | no | no | no | no | no | no |
| 3:00 | 186 | 5 | | no | no | no | no | no | no | no | no |
| 4:00 | 386 | 5 | | no | no | no | no | yes | no | no | no |
| 5:00 | 859 | 15 | | yes | no | yes | no | yes | no | yes | no |
| 6:00 | 1,675 | 15 | | yes | no | yes | no | yes | no | yes | no |
| 7:00 | 1,903 | 19 | | yes | no | yes | no | yes | no | yes | no |
| 8:00 | 1,281 | 20 | | yes | no | yes | no | yes | no | yes | no |
| 9:00 | 1,384 | 20 | | yes | no | yes | no | yes | no | yes | no |
| 10:00 | 1,214 | 20 | | yes | no | yes | no | yes | no | yes | no |
| 11:00 | 1,270 | 25 | | yes | no | yes | no | yes | no | yes | no |
| 12:00 | 1,405 | 26 | | yes | no | yes | no | yes | no | yes | no |
| 13:00 | 1,476 | 25 | | yes | no | yes | no | yes | no | yes | no |
| 14:00 | 1,766 | 29 | | yes | no | yes | no | yes | no | yes | no |
| 15:00 | 2,205 | 41 | | yes | no | yes | no | yes | no | yes | no |
| 16:00 | 2,529 | 47 | | yes | no | yes | no | yes | no | yes | yes |
| 17:00 | 2,506 | 49 | | yes | no | yes | no | yes | no | yes | yes |
| 18:00 | 1,963 | 44 | | yes | no | yes | no | yes | no | yes | yes |
| 19:00 | 1,202 | 35 | | yes | no | yes | no | yes | no | yes | no |
| 20:00 | 914 | 20 | | yes | no | yes | no | yes | no | yes | no |
| 21:00 | 612 | 15 | | yes | no | no | no | yes | no | yes | no |
| 22:00 | 426 | 10 | | yes | no | no | no | yes | no | no | no |
| 23:00 | 256 | 5 | | no | no | no | no | no | no | no | no |
| Total | 27,829 | 490 | | 0 | Not Met | 0 | Not Met | 0 | Not Met | | |

* Vehicles per hour on higher-volume minor-street approach (one direction only)

Intersection: Gun Club Road at Addison Avenue

Warrant 1: 8 Hour Analysis (70% Factor) - 2027 Background Volumes

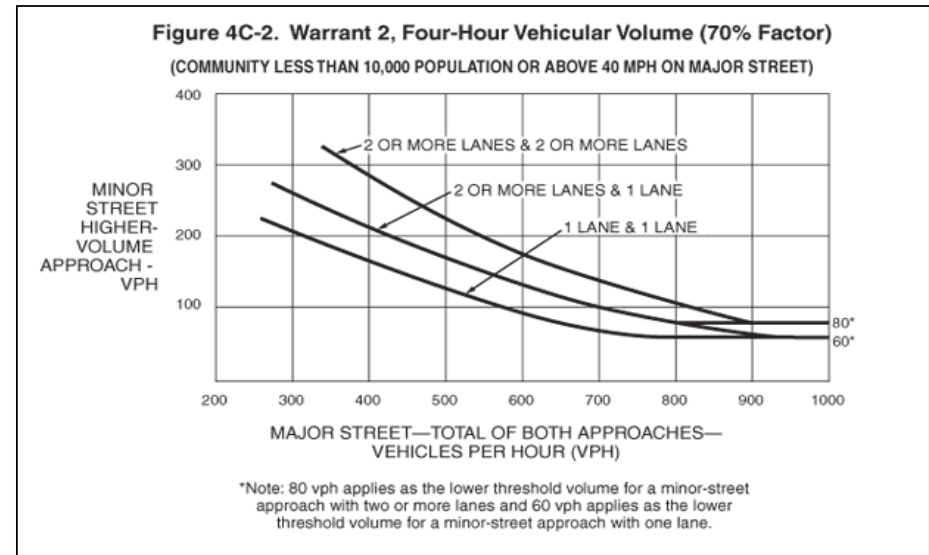
| Day 3 | Major Gun Club Rd EB / WB | Minor* Addison Ave WB | Warrant Type | Condition A | | Condition B | | Condition A + B | | | |
|-------------|---------------------------------|-----------------------------|--|-------------|---------|-------------|---------|-----------------|---------|---------|---------|
| | | | Street Designation | Major | Minor | Major | Minor | Major A | Minor A | Major B | Minor B |
| Time of Day | Number of Lanes | | Vehicles per Hour Needed to Meet Warrant | 420 | 105 | 630 | 53 | 336 | 84 | 504 | 42 |
| | 2 | 1 | | | | | | | | | |
| 0:00 | 135 | 0 | Warrant is Met (yes/no) | no | no | no | no | no | no | no | no |
| 1:00 | 92 | 0 | | no | no | no | no | no | no | no | no |
| 2:00 | 106 | 0 | | no | no | no | no | no | no | no | no |
| 3:00 | 173 | 5 | | no | no | no | no | no | no | no | no |
| 4:00 | 383 | 5 | | no | no | no | no | yes | no | no | no |
| 5:00 | 947 | 15 | | yes | no | yes | no | yes | no | yes | no |
| 6:00 | 1,642 | 15 | | yes | no | yes | no | yes | no | yes | no |
| 7:00 | 2,395 | 19 | | yes | no | yes | no | yes | no | yes | no |
| 8:00 | 2,007 | 20 | | yes | no | yes | no | yes | no | yes | no |
| 9:00 | 1,361 | 20 | | yes | no | yes | no | yes | no | yes | no |
| 10:00 | 1,208 | 20 | | yes | no | yes | no | yes | no | yes | no |
| 11:00 | 1,377 | 25 | | yes | no | yes | no | yes | no | yes | no |
| 12:00 | 1,424 | 26 | | yes | no | yes | no | yes | no | yes | no |
| 13:00 | 1,473 | 25 | | yes | no | yes | no | yes | no | yes | no |
| 14:00 | 1,898 | 29 | | yes | no | yes | no | yes | no | yes | no |
| 15:00 | 2,309 | 41 | | yes | no | yes | no | yes | no | yes | no |
| 16:00 | 2,584 | 47 | | yes | no | yes | no | yes | no | yes | yes |
| 17:00 | 2,444 | 49 | | yes | no | yes | no | yes | no | yes | yes |
| 18:00 | 1,966 | 44 | | yes | no | yes | no | yes | no | yes | yes |
| 19:00 | 1,320 | 35 | | yes | no | yes | no | yes | no | yes | no |
| 20:00 | 919 | 20 | | yes | no | yes | no | yes | no | yes | no |
| 21:00 | 600 | 15 | | yes | no | no | no | yes | no | yes | no |
| 22:00 | 464 | 10 | | yes | no | no | no | yes | no | no | no |
| 23:00 | 309 | 5 | | no | no | no | no | no | no | no | no |
| Total | 29,536 | 490 | | 0 | Not Met | 0 | Not Met | 0 | Not Met | | |

* Vehicles per hour on higher-volume minor-street approach (one direction only)

Intersection: Gun Club Rd at Addison Ave

Warrant 2: 4 Hour Analysis (70% Factor) - 2027 Background Volumes

| Day 1 | Major Gun Club Rd NB/SB | Minor* Addison Ave EB | | Warrant 2 (Figure 4C-2) |
|----------------|-------------------------------|-----------------------------|----------|----------------------------|
| Time of Day | Number of Lanes | | | |
| | 2 | 1 | | |
| 0:00 | 112 | 0 | | no |
| 1:00 | 95 | 0 | | no |
| 2:00 | 122 | 0 | | no |
| 3:00 | 199 | 5 | | no |
| 4:00 | 374 | 5 | | no |
| 5:00 | 860 | 15 | | no |
| 6:00 | 1,611 | 15 | | no |
| 7:00 | 2,339 | 19 | | no |
| 8:00 | 2,196 | 20 | | no |
| 9:00 | 1,318 | 20 | | no |
| 10:00 | 1,247 | 20 | | no |
| 11:00 | 1,377 | 25 | | no |
| 12:00 | 1,398 | 26 | | no |
| 13:00 | 1,546 | 25 | | no |
| 14:00 | 1,812 | 29 | | no |
| 15:00 | 2,387 | 41 | | no |
| 16:00 | 2,545 | 47 | | no |
| 17:00 | 2,500 | 49 | | no |
| 18:00 | 1,738 | 44 | | no |
| 19:00 | 1,143 | 35 | | no |
| 20:00 | 1,116 | 20 | | no |
| 21:00 | 758 | 15 | | no |
| 22:00 | 481 | 10 | | no |
| 23:00 | 305 | 5 | | no |
| Total | 29,579 | 490 | 0 | Not Met |

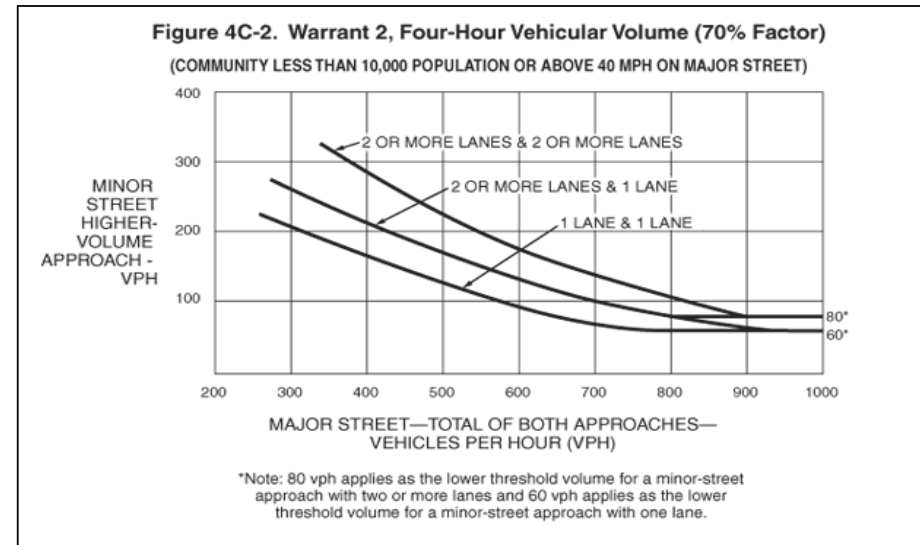
Warrant
is Met
(yes/no)

*The minor volume used in this analysis comes from the minor approach with the higher total volume during the full study day.

Intersection: Gun Club Rd at Addison Ave

Warrant 2: 4 Hour Analysis (70% Factor) - 2027 Background + Project Volumes

| Day 2 | Major Gun Club Rd NB / SB | Minor* Addison Ave WB | | Warrant 2 (Figure 4C-2) |
|----------------|---------------------------------|-----------------------------|----------|----------------------------|
| Time of Day | Number of Lanes | | | |
| | 2 | 1 | | |
| 0:00 | 171 | 0 | | no |
| 1:00 | 106 | 0 | | no |
| 2:00 | 134 | 0 | | no |
| 3:00 | 186 | 5 | | no |
| 4:00 | 386 | 5 | | no |
| 5:00 | 859 | 15 | | no |
| 6:00 | 1,675 | 15 | | no |
| 7:00 | 1,903 | 19 | | no |
| 8:00 | 1,281 | 20 | | no |
| 9:00 | 1,384 | 20 | | no |
| 10:00 | 1,214 | 20 | | no |
| 11:00 | 1,270 | 25 | | no |
| 12:00 | 1,405 | 26 | | no |
| 13:00 | 1,476 | 25 | | no |
| 14:00 | 1,766 | 29 | | no |
| 15:00 | 2,205 | 41 | | no |
| 16:00 | 2,529 | 47 | | no |
| 17:00 | 2,506 | 49 | | no |
| 18:00 | 1,963 | 44 | | no |
| 19:00 | 1,202 | 35 | | no |
| 20:00 | 914 | 20 | | no |
| 21:00 | 612 | 15 | | no |
| 22:00 | 426 | 10 | | no |
| 23:00 | 256 | 5 | | no |
| Total | 27,829 | 490 | 0 | Not Met |

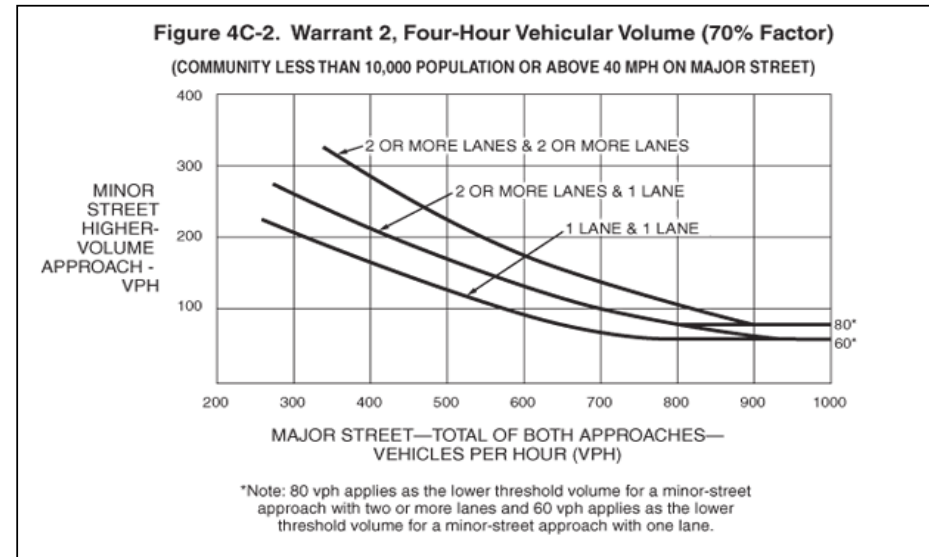
Warrant
is Met
(yes/no)

*The minor volume used in this analysis comes from the minor approach with the higher total volume during the full study day.

Intersection: Gun Club Rd at Addison Ave

Warrant 2: 4 Hour Analysis (70% Factor) - 2027 Background Volumes

| Day 3 | Major Gun Club Rd NB / SB | Minor* Addison Ave WB | | Warrant 2 (Figure 4C-2) |
|----------------|---------------------------------|-----------------------------|----------|----------------------------|
| Time of Day | Number of Lanes | | | |
| | 2 | 1 | | |
| 0:00 | 135 | 0 | | no |
| 1:00 | 92 | 0 | | no |
| 2:00 | 106 | 0 | | no |
| 3:00 | 173 | 5 | | no |
| 4:00 | 383 | 5 | | no |
| 5:00 | 947 | 15 | | no |
| 6:00 | 1,642 | 15 | | no |
| 7:00 | 2,395 | 19 | | no |
| 8:00 | 2,007 | 20 | | no |
| 9:00 | 1,361 | 20 | | no |
| 10:00 | 1,208 | 20 | | no |
| 11:00 | 1,377 | 25 | | no |
| 12:00 | 1,424 | 26 | | no |
| 13:00 | 1,473 | 25 | | no |
| 14:00 | 1,898 | 29 | | no |
| 15:00 | 2,309 | 41 | | no |
| 16:00 | 2,584 | 47 | | no |
| 17:00 | 2,444 | 49 | | no |
| 18:00 | 1,966 | 44 | | no |
| 19:00 | 1,320 | 35 | | no |
| 20:00 | 919 | 20 | | no |
| 21:00 | 600 | 15 | | no |
| 22:00 | 464 | 10 | | no |
| 23:00 | 309 | 5 | | no |
| Total | 29,536 | 490 | 0 | Not Met |

Warrant
is Met
(yes/no)

*The minor volume used in this analysis comes from the minor approach with the higher total volume during the full study day.

Intersection: Gun Club Road at Addison Avenue

Warrant 1: 8 Hour Analysis (70% Factor) - 2027 Background + Project Volumes

| Day 1 | Major Gun Club Rd NB/SB | Minor* Addison Ave / Access EB | Warrant Type | Condition A | | Condition B | | Condition A + B | | | |
|--------------|-------------------------------|---|--|-------------|------------|-------------|------------|-----------------|------------|---------|---------|
| Time of Day | Number of Lanes | | Street Designation | Major | Minor | Major | Minor | Major A | Minor A | Major B | Minor B |
| | 2 | 1 | Vehicles per Hour Needed to Meet Warrant | 420 | 105 | 630 | 53 | 336 | 84 | 504 | 42 |
| 0:00 | 112 | 0 | Warrant is Met (yes/no) | no | no | no | no | no | no | no | no |
| 1:00 | 95 | 0 | | no | no | no | no | no | no | no | no |
| 2:00 | 122 | 0 | | no | no | no | no | no | no | no | no |
| 3:00 | 199 | 0 | | no | no | no | no | no | no | no | no |
| 4:00 | 379 | 5 | | no | no | no | no | yes | no | no | no |
| 5:00 | 887 | 28 | | yes | no | yes | no | yes | no | yes | no |
| 6:00 | 1,679 | 78 | | yes | no | yes | yes | yes | no | yes | yes |
| 7:00 | 2,467 | 90 | | yes | no | yes | yes | yes | yes | yes | yes |
| 8:00 | 2,490 | 92 | | yes | no | yes | yes | yes | yes | yes | yes |
| 9:00 | 1,431 | 100 | | yes | no | yes | yes | yes | yes | yes | yes |
| 10:00 | 1,340 | 90 | | yes | no | yes | yes | yes | yes | yes | yes |
| 11:00 | 1,445 | 113 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 12:00 | 1,464 | 113 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 13:00 | 1,619 | 130 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 14:00 | 1,891 | 135 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 15:00 | 2,498 | 180 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 16:00 | 2,655 | 283 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 17:00 | 2,612 | 355 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 18:00 | 1,816 | 292 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 19:00 | 1,188 | 115 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 20:00 | 1,136 | 25 | | yes | no | yes | no | yes | no | yes | no |
| 21:00 | 768 | 18 | | yes | no | yes | no | yes | no | yes | no |
| 22:00 | 481 | 5 | | yes | no | no | no | yes | no | no | no |
| 23:00 | 305 | 3 | | no | no | no | no | no | no | no | no |
| Total | 31,079 | 2,250 | | 9 | Met | 14 | Met | 13 | Met | | |

* Vehicles per hour on higher-volume minor-street approach (one direction only)

Intersection: Gun Club Road at Addison Avenue

Warrant 1: 8 Hour Analysis (70% Factor) - 2027 Background + Project Volumes

| Day 2 | Major Gun Club Rd NB / SB | Minor* Addison Ave / Access WB | Warrant Type Street Designation | Condition A Major Minor | | Condition B Major Minor | | Condition A + B Major A Minor A Major B Minor B | | | |
|----------------|---------------------------------|---|--|----------------------------|------------|----------------------------|------------|--|------------|-----|-----|
| Time of Day | Number of Lanes | | Vehicles per Hour Needed to Meet Warrant | 420 | 105 | 630 | 53 | 336 | 84 | 504 | 42 |
| | 2 | 1 | | | | | | | | | |
| 0:00 | 171 | 0 | Warrant is Met (yes/no) | no | no | no | no | no | no | no | no |
| 1:00 | 106 | 0 | | no | no | no | no | no | no | no | no |
| 2:00 | 134 | 0 | | no | no | no | no | no | no | no | no |
| 3:00 | 186 | 0 | | no | no | no | no | no | no | no | no |
| 4:00 | 391 | 5 | | no | no | no | no | yes | no | no | no |
| 5:00 | 886 | 28 | | yes | no | yes | no | yes | no | yes | no |
| 6:00 | 1,743 | 78 | | yes | no | yes | yes | yes | no | yes | yes |
| 7:00 | 2,031 | 90 | | yes | no | yes | yes | yes | yes | yes | yes |
| 8:00 | 1,575 | 92 | | yes | no | yes | yes | yes | yes | yes | yes |
| 9:00 | 1,497 | 100 | | yes | no | yes | yes | yes | yes | yes | yes |
| 10:00 | 1,307 | 90 | | yes | no | yes | yes | yes | yes | yes | yes |
| 11:00 | 1,338 | 113 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 12:00 | 1,471 | 113 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 13:00 | 1,549 | 130 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 14:00 | 1,845 | 135 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 15:00 | 2,316 | 180 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 16:00 | 2,639 | 283 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 17:00 | 2,618 | 355 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 18:00 | 2,041 | 292 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 19:00 | 1,247 | 115 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 20:00 | 934 | 25 | | yes | no | yes | no | yes | no | yes | no |
| 21:00 | 622 | 18 | | yes | no | no | no | yes | no | yes | no |
| 22:00 | 426 | 5 | | yes | no | no | no | yes | no | no | no |
| 23:00 | 256 | 3 | | no | no | no | no | no | no | no | no |
| Total | 29,329 | 2,250 | | 9 | Met | 14 | Met | 13 | Met | | |

* Vehicles per hour on higher-volume minor-street approach (one direction only)

Intersection: Gun Club Road at Addison Avenue

Warrant 1: 8 Hour Analysis (70% Factor) - 2027 Background + Project Volumes

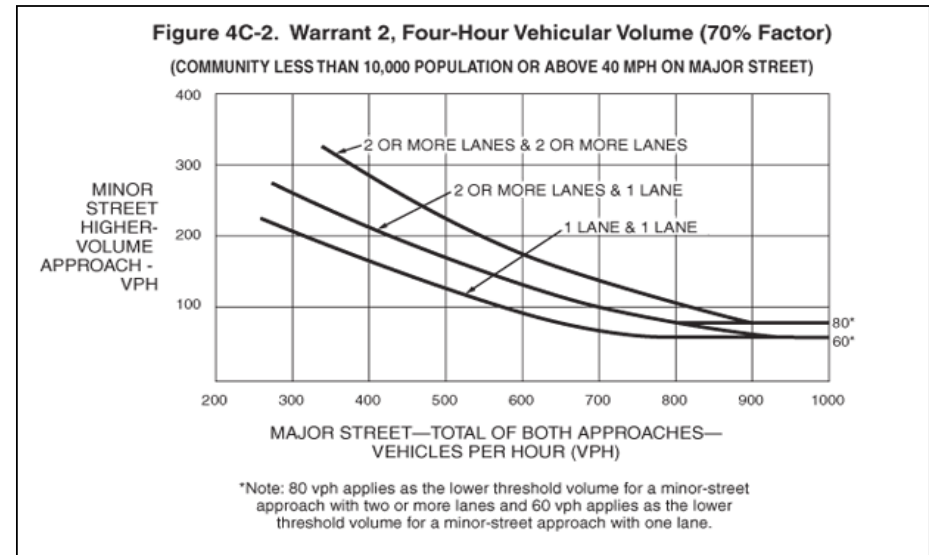
| Day 3 | Major Gun Club Rd NB / SB | Minor* Addison Ave / Access WB | Warrant Type Street Designation | Condition A Major Minor | | Condition B Major Minor | | Condition A + B Major A Minor A Major B Minor B | | | |
|-------------|---------------------------------|---|--|----------------------------|-----|----------------------------|-----|--|-----|-----|-----|
| Time of Day | Number of Lanes 2 1 | | Vehicles per Hour Needed to Meet Warrant | 420 | 105 | 630 | 53 | 336 | 84 | 504 | 42 |
| 0:00 | 135 | 0 | Warrant is Met (yes/no) | no | no | no | no | no | no | no | no |
| 1:00 | 92 | 0 | | no | no | no | no | no | no | no | no |
| 2:00 | 106 | 0 | | no | no | no | no | no | no | no | no |
| 3:00 | 173 | 0 | | no | no | no | no | no | no | no | no |
| 4:00 | 388 | 5 | | no | no | no | no | yes | no | no | no |
| 5:00 | 974 | 28 | | yes | no | yes | no | yes | no | yes | no |
| 6:00 | 1,710 | 78 | | yes | no | yes | yes | yes | no | yes | yes |
| 7:00 | 2,523 | 90 | | yes | no | yes | yes | yes | yes | yes | yes |
| 8:00 | 2,301 | 92 | | yes | no | yes | yes | yes | yes | yes | yes |
| 9:00 | 1,474 | 100 | | yes | no | yes | yes | yes | yes | yes | yes |
| 10:00 | 1,301 | 90 | | yes | no | yes | yes | yes | yes | yes | yes |
| 11:00 | 1,445 | 113 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 12:00 | 1,490 | 113 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 13:00 | 1,546 | 130 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 14:00 | 1,977 | 135 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 15:00 | 2,420 | 180 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 16:00 | 2,694 | 283 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 17:00 | 2,556 | 355 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 18:00 | 2,044 | 292 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 19:00 | 1,365 | 115 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 20:00 | 939 | 25 | | yes | no | yes | no | yes | no | yes | no |
| 21:00 | 610 | 18 | | yes | no | no | no | yes | no | yes | no |
| 22:00 | 464 | 5 | | yes | no | no | no | yes | no | no | no |
| 23:00 | 309 | 3 | | no | no | no | no | no | no | no | no |
| Total | 31,036 | 2,250 | | 9 | Met | 14 | Met | 13 | Met | | |

* Vehicles per hour on higher-volume minor-street approach (one direction only)

Intersection: Gun Club Rd at Addison Ave / Access

Warrant 2: 4 Hour Analysis (70% Factor) - 2027 Background + Project Volumes

| Day 1 | Major Gun Club Rd NB/SB | Minor* Addison Ave / Access EB | | Warrant 2 (Figure 4C-2) |
|----------------|-------------------------------|---|-----------|----------------------------|
| Time of Day | Number of Lanes | | | |
| | 2 | 1 | | |
| 0:00 | 112 | 0 | | no |
| 1:00 | 95 | 0 | | no |
| 2:00 | 122 | 0 | | no |
| 3:00 | 199 | 0 | | no |
| 4:00 | 379 | 5 | | no |
| 5:00 | 887 | 28 | | no |
| 6:00 | 1,679 | 78 | | Yes |
| 7:00 | 2,467 | 90 | | Yes |
| 8:00 | 2,490 | 92 | | Yes |
| 9:00 | 1,431 | 100 | | Yes |
| 10:00 | 1,340 | 90 | | Yes |
| 11:00 | 1,445 | 113 | | Yes |
| 12:00 | 1,464 | 113 | | Yes |
| 13:00 | 1,619 | 130 | | Yes |
| 14:00 | 1,891 | 135 | | Yes |
| 15:00 | 2,498 | 180 | | Yes |
| 16:00 | 2,655 | 283 | | Yes |
| 17:00 | 2,612 | 355 | | Yes |
| 18:00 | 1,816 | 292 | | Yes |
| 19:00 | 1,188 | 115 | | Yes |
| 20:00 | 1,136 | 25 | | no |
| 21:00 | 768 | 18 | | no |
| 22:00 | 481 | 5 | | no |
| 23:00 | 305 | 3 | | no |
| Total | 31,079 | 2,250 | 14 | Met |

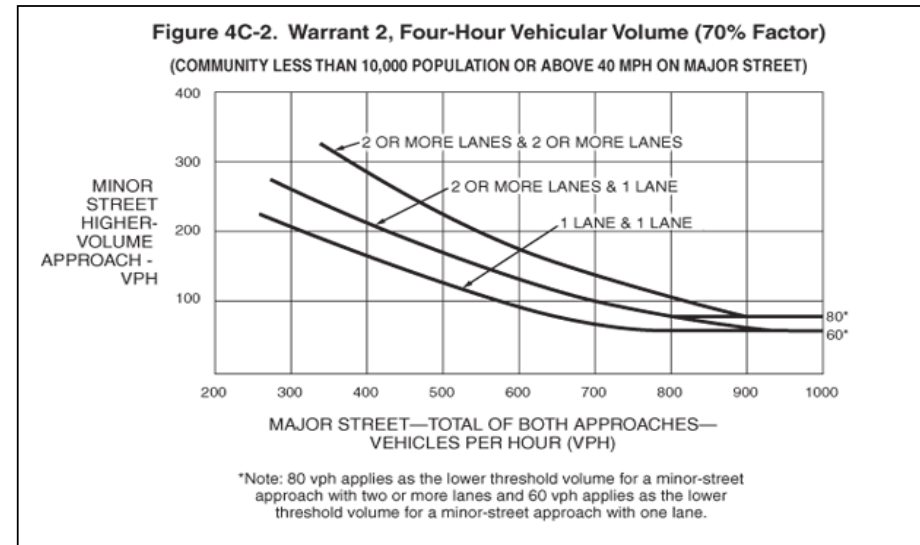
Warrant
is Met
(yes/no)

*The minor volume used in this analysis comes from the minor approach with the higher total volume during the full study day.

Intersection: Gun Club Rd at Addison Ave / Access

Warrant 2: 4 Hour Analysis (70% Factor) - 2027 Background + Project Volumes

| Day 2 | Major Gun Club Rd NB / SB | Minor* Addison Ave / Access WB | | Warrant 2 (Figure 4C-2) |
|----------------|---------------------------------|---|-----------|----------------------------|
| Time of Day | Number of Lanes | | | |
| | 2 | 1 | | |
| 0:00 | 171 | 0 | | no |
| 1:00 | 106 | 0 | | no |
| 2:00 | 134 | 0 | | no |
| 3:00 | 186 | 0 | | no |
| 4:00 | 391 | 5 | | no |
| 5:00 | 886 | 28 | | no |
| 6:00 | 1,743 | 78 | | Yes |
| 7:00 | 2,031 | 90 | | Yes |
| 8:00 | 1,575 | 92 | | Yes |
| 9:00 | 1,497 | 100 | | Yes |
| 10:00 | 1,307 | 90 | | Yes |
| 11:00 | 1,338 | 113 | | Yes |
| 12:00 | 1,471 | 113 | | Yes |
| 13:00 | 1,549 | 130 | | Yes |
| 14:00 | 1,845 | 135 | | Yes |
| 15:00 | 2,316 | 180 | | Yes |
| 16:00 | 2,639 | 283 | | Yes |
| 17:00 | 2,618 | 355 | | Yes |
| 18:00 | 2,041 | 292 | | Yes |
| 19:00 | 1,247 | 115 | | Yes |
| 20:00 | 934 | 25 | | no |
| 21:00 | 622 | 18 | | no |
| 22:00 | 426 | 5 | | no |
| 23:00 | 256 | 3 | | no |
| Total | 29,329 | 2,250 | 14 | Met |

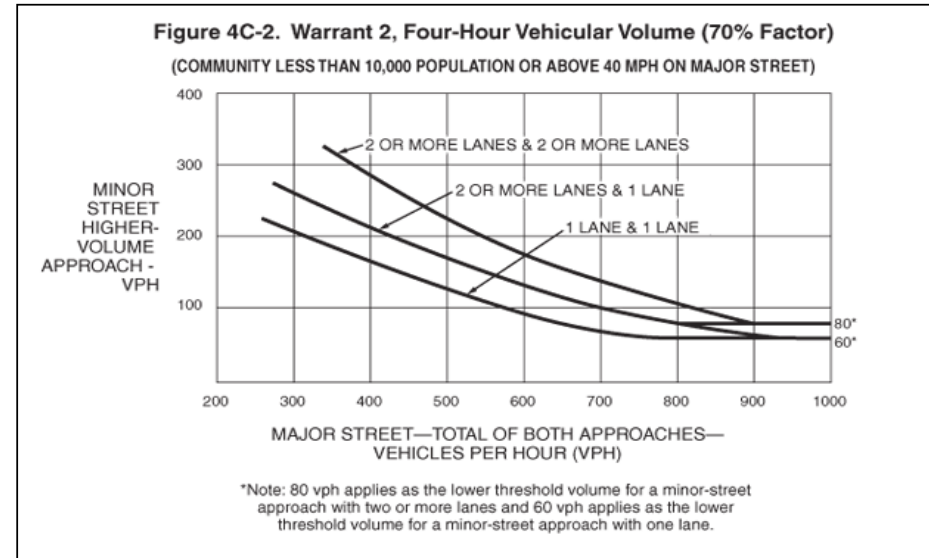
Warrant
is Met
(yes/no)

*The minor volume used in this analysis comes from the minor approach with the higher total volume during the full study day.

Intersection: Gun Club Rd at Addison Ave / Access

Warrant 2: 4 Hour Analysis (70% Factor) - 2027 Background + Project Volumes

| Day 3 | Major Gun Club Rd NB / SB | Minor* Addison Ave / Access WB | | Warrant 2 (Figure 4C-2) |
|----------------|---------------------------------|---|-------------------------------|----------------------------|
| Time of Day | Number of Lanes | | | |
| | 2 | 1 | | |
| 0:00 | 135 | 0 | | no |
| 1:00 | 92 | 0 | | no |
| 2:00 | 106 | 0 | | no |
| 3:00 | 173 | 0 | | no |
| 4:00 | 388 | 5 | | no |
| 5:00 | 974 | 28 | | no |
| 6:00 | 1,710 | 78 | | Yes |
| 7:00 | 2,523 | 90 | | Yes |
| 8:00 | 2,301 | 92 | | Yes |
| 9:00 | 1,474 | 100 | | Yes |
| 10:00 | 1,301 | 90 | | Yes |
| 11:00 | 1,445 | 113 | | Yes |
| 12:00 | 1,490 | 113 | | Yes |
| 13:00 | 1,546 | 130 | Warrant is Met (yes/no) | Yes |
| 14:00 | 1,977 | 135 | | Yes |
| 15:00 | 2,420 | 180 | | Yes |
| 16:00 | 2,694 | 283 | | Yes |
| 17:00 | 2,556 | 355 | | Yes |
| 18:00 | 2,044 | 292 | | Yes |
| 19:00 | 1,365 | 115 | | Yes |
| 20:00 | 939 | 25 | | no |
| 21:00 | 610 | 18 | | no |
| 22:00 | 464 | 5 | | no |
| 23:00 | 309 | 3 | | no |
| Total | 31,036 | 2,250 | 14 | Met |



*The minor volume used in this analysis comes from the minor approach with the higher total volume during the full study day.

Intersection: Gun Club Road at Addison Avenue

Warrant 1: 8 Hour Analysis (70% Factor) - 2050 Background Volumes

| Day 1 | Major Gun Club Rd NB/SB | Minor* Addison Ave WB | Warrant Type Street Designation | Condition A Major Minor | | Condition B Major Minor | | Condition A + B Major A Minor A Major B Minor B | | | |
|-------------|-------------------------------|-----------------------------|--|----------------------------|---------|----------------------------|-----|--|-----|-----|-----|
| Time of Day | Number of Lanes 3 1 | | Vehicles per Hour Needed to Meet Warrant | 420 | 105 | 630 | 53 | 336 | 84 | 504 | 42 |
| 0:00 | 180 | 0 | Warrant is Met (yes/no) | no | no | no | no | no | no | no | no |
| 1:00 | 153 | 0 | | no | no | no | no | no | no | no | no |
| 2:00 | 197 | 0 | | no | no | no | no | no | no | no | no |
| 3:00 | 321 | 19 | | no | no | no | no | no | no | no | no |
| 4:00 | 604 | 19 | | yes | no | no | no | yes | no | yes | no |
| 5:00 | 1,388 | 43 | | yes | no | yes | no | yes | no | yes | yes |
| 6:00 | 2,600 | 67 | | yes | no | yes | yes | yes | no | yes | yes |
| 7:00 | 3,777 | 70 | | yes | no | yes | yes | yes | no | yes | yes |
| 8:00 | 3,544 | 75 | | yes | no | yes | yes | yes | no | yes | yes |
| 9:00 | 2,129 | 75 | | yes | no | yes | yes | yes | no | yes | yes |
| 10:00 | 2,013 | 70 | | yes | no | yes | yes | yes | no | yes | yes |
| 11:00 | 2,223 | 90 | | yes | no | yes | yes | yes | yes | yes | yes |
| 12:00 | 2,256 | 100 | | yes | no | yes | yes | yes | yes | yes | yes |
| 13:00 | 2,495 | 100 | | yes | no | yes | yes | yes | yes | yes | yes |
| 14:00 | 2,926 | 130 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 15:00 | 3,855 | 165 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 16:00 | 4,108 | 185 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 17:00 | 4,035 | 194 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 18:00 | 2,806 | 181 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 19:00 | 1,845 | 123 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 20:00 | 1,801 | 98 | | yes | no | yes | yes | yes | yes | yes | yes |
| 21:00 | 1,223 | 78 | | yes | no | yes | yes | yes | no | yes | yes |
| 22:00 | 775 | 39 | | yes | no | yes | no | yes | no | yes | no |
| 23:00 | 492 | 19 | | yes | no | no | no | yes | no | no | no |
| Total | 47,746 | 1,940 | | 6 | Not Met | 16 | Met | 10 | Met | | |

* Vehicles per hour on higher-volume minor-street approach (one direction only)

Intersection: Gun Club Road at Addison Avenue

Warrant 1: 8 Hour Analysis (70% Factor) - 2050 Background Volumes

| Day 2 | Major Gun Club Rd NB / SB | Minor* Addison Ave WB | Warrant Type Street Designation | Condition A Major Minor | | Condition B Major Minor | | Condition A + B Major A Minor A Major B Minor B | | | |
|----------------|---------------------------------|-----------------------------|--|----------------------------|----------------|----------------------------|------------|--|------------|-----|-----|
| Time of Day | Number of Lanes | | Vehicles per Hour Needed to Meet Warrant | 420 | 105 | 630 | 53 | 336 | 84 | 504 | 42 |
| | 3 | 1 | | | | | | | | | |
| 0:00 | 277 | 0 | Warrant is Met (yes/no) | no | no | no | no | no | no | no | no |
| 1:00 | 170 | 0 | | no | no | no | no | no | no | no | no |
| 2:00 | 216 | 0 | | no | no | no | no | no | no | no | no |
| 3:00 | 299 | 19 | | no | no | no | no | no | no | no | no |
| 4:00 | 623 | 19 | | yes | no | no | no | yes | no | yes | no |
| 5:00 | 1,386 | 43 | | yes | no | yes | no | yes | no | yes | yes |
| 6:00 | 2,703 | 67 | | yes | no | yes | yes | yes | no | yes | yes |
| 7:00 | 3,073 | 70 | | yes | no | yes | yes | yes | no | yes | yes |
| 8:00 | 2,068 | 75 | | yes | no | yes | yes | yes | no | yes | yes |
| 9:00 | 2,233 | 75 | | yes | no | yes | yes | yes | no | yes | yes |
| 10:00 | 1,960 | 70 | | yes | no | yes | yes | yes | no | yes | yes |
| 11:00 | 2,051 | 90 | | yes | no | yes | yes | yes | yes | yes | yes |
| 12:00 | 2,269 | 100 | | yes | no | yes | yes | yes | yes | yes | yes |
| 13:00 | 2,382 | 100 | | yes | no | yes | yes | yes | yes | yes | yes |
| 14:00 | 2,852 | 130 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 15:00 | 3,560 | 165 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 16:00 | 4,082 | 185 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 17:00 | 4,045 | 194 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 18:00 | 3,169 | 181 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 19:00 | 1,942 | 123 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 20:00 | 1,476 | 98 | | yes | no | yes | yes | yes | yes | yes | yes |
| 21:00 | 988 | 78 | | yes | no | yes | yes | yes | no | yes | yes |
| 22:00 | 688 | 39 | | yes | no | yes | no | yes | no | yes | no |
| 23:00 | 413 | 19 | | no | no | no | no | yes | no | no | no |
| Total | 44,925 | 1,940 | | 6 | Not Met | 16 | Met | 10 | Met | | |

* Vehicles per hour on higher-volume minor-street approach (one direction only)

Intersection: Gun Club Road at Addison Avenue

Warrant 1: 8 Hour Analysis (70% Factor) - 2050 Background Volumes

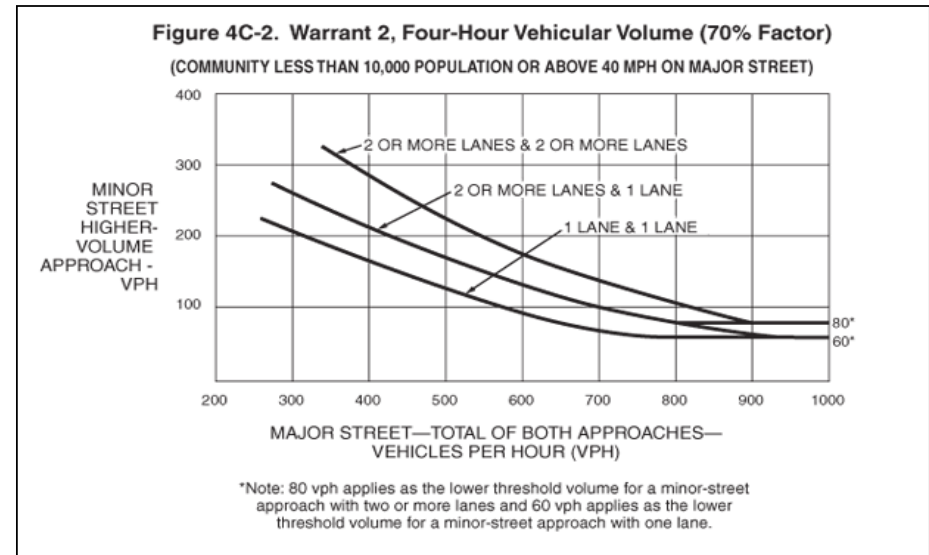
| Day 3 | Major Gun Club Rd NB / SB | Minor* Addison Ave WB | Warrant Type | Condition A | | Condition B | | Condition A + B | | | |
|--------------|---------------------------------|-----------------------------|--|-------------|----------------|-------------|------------|-----------------|------------|---------|---------|
| | | | Street Designation | Major | Minor | Major | Minor | Major A | Minor A | Major B | Minor B |
| Time of Day | Number of Lanes | | Vehicles per Hour Needed to Meet Warrant | 420 | 105 | 630 | 53 | 336 | 84 | 504 | 42 |
| | 3 | 1 | | | | | | | | | |
| 0:00 | 218 | 0 | | no | no | no | no | no | no | no | no |
| 1:00 | 148 | 0 | | no | no | no | no | no | no | no | no |
| 2:00 | 172 | 0 | | no | no | no | no | no | no | no | no |
| 3:00 | 279 | 19 | | no | no | no | no | no | no | no | no |
| 4:00 | 618 | 19 | | yes | no | no | no | yes | no | yes | no |
| 5:00 | 1,529 | 43 | | yes | no | yes | no | yes | no | yes | yes |
| 6:00 | 2,651 | 67 | | yes | no | yes | yes | yes | no | yes | yes |
| 7:00 | 3,866 | 70 | | yes | no | yes | yes | yes | no | yes | yes |
| 8:00 | 3,239 | 75 | | yes | no | yes | yes | yes | no | yes | yes |
| 9:00 | 2,196 | 75 | | yes | no | yes | yes | yes | no | yes | yes |
| 10:00 | 1,950 | 70 | | yes | no | yes | yes | yes | no | yes | yes |
| 11:00 | 2,223 | 90 | | yes | no | yes | yes | yes | yes | yes | yes |
| 12:00 | 2,298 | 100 | | yes | no | yes | yes | yes | yes | yes | yes |
| 13:00 | 2,378 | 100 | | yes | no | yes | yes | yes | yes | yes | yes |
| 14:00 | 3,064 | 130 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 15:00 | 3,727 | 165 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 16:00 | 4,171 | 185 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 17:00 | 3,945 | 194 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 18:00 | 3,175 | 181 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 19:00 | 2,131 | 123 | | yes | yes | yes | yes | yes | yes | yes | yes |
| 20:00 | 1,482 | 98 | | yes | no | yes | yes | yes | yes | yes | yes |
| 21:00 | 969 | 78 | | yes | no | yes | yes | yes | no | yes | yes |
| 22:00 | 749 | 39 | | yes | no | yes | no | yes | no | yes | no |
| 23:00 | 499 | 19 | | yes | no | no | no | yes | no | no | no |
| Total | 47,677 | 1,940 | | 6 | Not Met | 16 | Met | 10 | Met | | |

* Vehicles per hour on higher-volume minor-street approach (one direction only)

Intersection: Gun Club Rd at Addison Ave

Warrant 2: 4 Hour Analysis (70% Factor) - 2050 Background Volumes

| Day 1 | Major Gun Club Rd NB/SB | Minor* Addison Ave WB | | Warrant 2 (Figure 4C-2) |
|----------------|-------------------------------|-----------------------------|-----------|----------------------------|
| Time of Day | Number of Lanes | | | |
| | 3 | 1 | | |
| 0:00 | 180 | 0 | | no |
| 1:00 | 153 | 0 | | no |
| 2:00 | 197 | 0 | | no |
| 3:00 | 321 | 19 | | no |
| 4:00 | 604 | 19 | | no |
| 5:00 | 1,388 | 43 | | no |
| 6:00 | 2,600 | 67 | | Yes |
| 7:00 | 3,777 | 70 | | Yes |
| 8:00 | 3,544 | 75 | | Yes |
| 9:00 | 2,129 | 75 | | Yes |
| 10:00 | 2,013 | 70 | | Yes |
| 11:00 | 2,223 | 90 | | Yes |
| 12:00 | 2,256 | 100 | | Yes |
| 13:00 | 2,495 | 100 | | Yes |
| 14:00 | 2,926 | 130 | | Yes |
| 15:00 | 3,855 | 165 | | Yes |
| 16:00 | 4,108 | 185 | | Yes |
| 17:00 | 4,035 | 194 | | Yes |
| 18:00 | 2,806 | 181 | | Yes |
| 19:00 | 1,845 | 123 | | Yes |
| 20:00 | 1,801 | 98 | | Yes |
| 21:00 | 1,223 | 78 | | Yes |
| 22:00 | 775 | 39 | | no |
| 23:00 | 492 | 19 | | no |
| Total | 47,746 | 1,940 | 16 | Met |

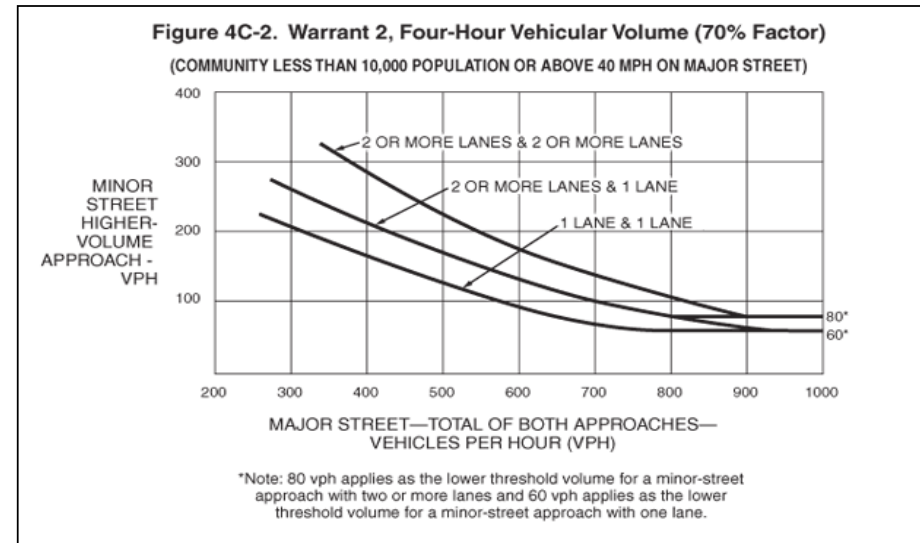
Warrant
is Met
(yes/no)

*The minor volume used in this analysis comes from the minor approach with the higher total volume during the full study day.

Intersection: Gun Club Rd at Addison Ave

Warrant 2: 4 Hour Analysis (70% Factor) - 2050 Background Volumes

| Day 2 | Major Gun Club Rd NB / SB | Minor* Addison Ave WB | | Warrant 2 (Figure 4C-2) |
|----------------|---------------------------------|-----------------------------|-----------|----------------------------|
| Time of Day | Number of Lanes | | | |
| | 3 | 1 | | |
| 0:00 | 277 | 0 | | no |
| 1:00 | 170 | 0 | | no |
| 2:00 | 216 | 0 | | no |
| 3:00 | 299 | 19 | | no |
| 4:00 | 623 | 19 | | no |
| 5:00 | 1,386 | 43 | | no |
| 6:00 | 2,703 | 67 | | Yes |
| 7:00 | 3,073 | 70 | | Yes |
| 8:00 | 2,068 | 75 | | Yes |
| 9:00 | 2,233 | 75 | | Yes |
| 10:00 | 1,960 | 70 | | Yes |
| 11:00 | 2,051 | 90 | | Yes |
| 12:00 | 2,269 | 100 | | Yes |
| 13:00 | 2,382 | 100 | | Yes |
| 14:00 | 2,852 | 130 | | Yes |
| 15:00 | 3,560 | 165 | | Yes |
| 16:00 | 4,082 | 185 | | Yes |
| 17:00 | 4,045 | 194 | | Yes |
| 18:00 | 3,169 | 181 | | Yes |
| 19:00 | 1,942 | 123 | | Yes |
| 20:00 | 1,476 | 98 | | Yes |
| 21:00 | 988 | 78 | | Yes |
| 22:00 | 688 | 39 | | no |
| 23:00 | 413 | 19 | | no |
| Total | 44,925 | 1,940 | 16 | Met |

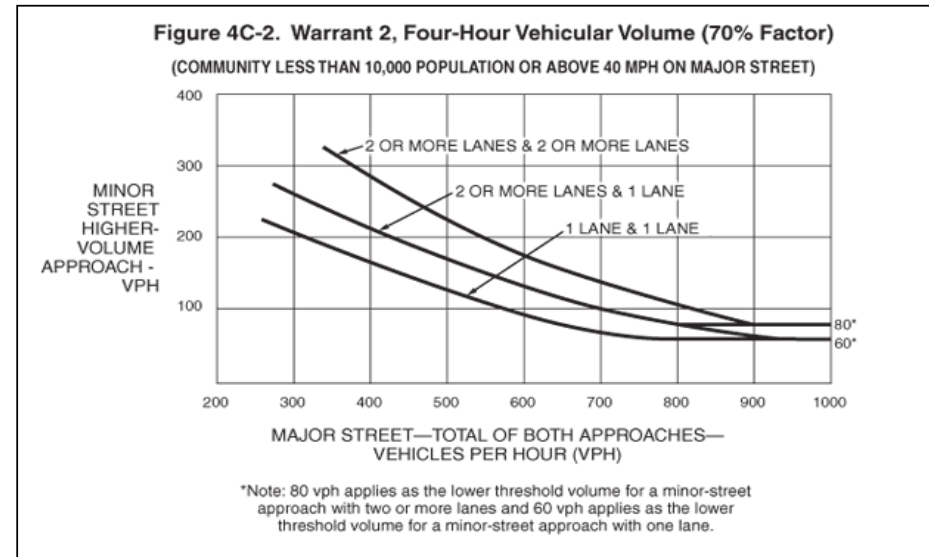
Warrant
is Met
(yes/no)

*The minor volume used in this analysis comes from the minor approach with the higher total volume during the full study day.

Intersection: Gun Club Rd at Addison Ave

Warrant 2: 4 Hour Analysis (70% Factor) - 2050 Background Volumes

| Day 3 | Major Gun Club Rd NB / SB | Minor* Addison Ave WB | | Warrant 2 (Figure 4C-2) |
|----------------|---------------------------------|-----------------------------|-----------|----------------------------|
| Time of Day | Number of Lanes | | | |
| | 3 | 1 | | |
| 0:00 | 218 | 0 | | no |
| 1:00 | 148 | 0 | | no |
| 2:00 | 172 | 0 | | no |
| 3:00 | 279 | 19 | | no |
| 4:00 | 618 | 19 | | no |
| 5:00 | 1,529 | 43 | | no |
| 6:00 | 2,651 | 67 | | Yes |
| 7:00 | 3,866 | 70 | | Yes |
| 8:00 | 3,239 | 75 | | Yes |
| 9:00 | 2,196 | 75 | | Yes |
| 10:00 | 1,950 | 70 | | Yes |
| 11:00 | 2,223 | 90 | | Yes |
| 12:00 | 2,298 | 100 | | Yes |
| 13:00 | 2,378 | 100 | | Yes |
| 14:00 | 3,064 | 130 | | Yes |
| 15:00 | 3,727 | 165 | | Yes |
| 16:00 | 4,171 | 185 | | Yes |
| 17:00 | 3,945 | 194 | | Yes |
| 18:00 | 3,175 | 181 | | Yes |
| 19:00 | 2,131 | 123 | | Yes |
| 20:00 | 1,482 | 98 | | Yes |
| 21:00 | 969 | 78 | | Yes |
| 22:00 | 749 | 39 | | no |
| 23:00 | 499 | 19 | | no |
| Total | 47,677 | 1,940 | 16 | Met |

Warrant
is Met
(yes/no)

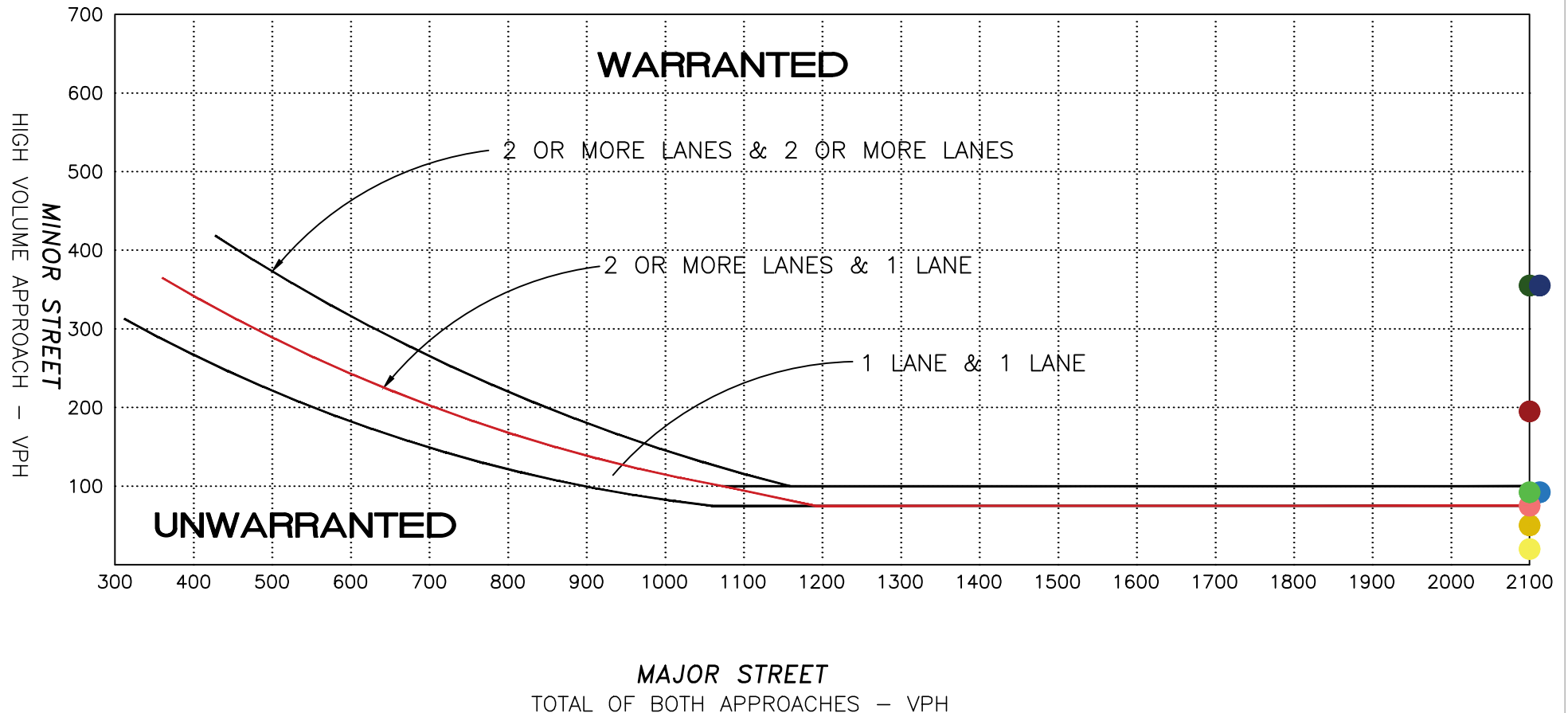
*The minor volume used in this analysis comes from the minor approach with the higher total volume during the full study day.

PEAK HOUR VOLUME WARRANT (70%)

APPLIED FOR PLANNING PURPOSES

KEY FOR INTERSECTIONS

| MET | AM | PM | Year | Scenario |
|-----|--------|------------|------|-----------------|
| No | Yellow | Yellow | 2027 | Background |
| Yes | Pink | Red | 2050 | Background |
| Yes | Green | Dark Green | 2027 | Bkgrd + Project |
| Yes | Blue | Dark Blue | 2050 | Bkgrd + Project |



NOTE: 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES
AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.



GUN CLUB BUSINESS PARK TRAFFIC IMPACT STUDY - AURORA, CO

PEAK HOUR SIGNAL WARRANT - GUN CLUB ROAD AT ADDISON AVENUE

| | | | | | | | | | |
|--------------|-------|----------------|-----|------|------------|----------|-----|----------|------------|
| FT Project # | 23087 | Original Scale | NTS | Date | 11/17/2023 | Drawn by | CRS | Figure # | APPENDIX 3 |
|--------------|-------|----------------|-----|------|------------|----------|-----|----------|------------|

Internal Capture and Pass-By Calculations

| NCHRP 684 Internal Trip Capture Estimation Tool | | | | | |
|---|------------------------------------|----------------------|--------------------------------------|--|--|
| Project Name: | Gun Club Business Park Development | Organization: | Fox Tuttle Transportation Group, LLC | | |
| Project Location: | Aurora, CO | Performed By: | C. Slade | | |
| Scenario Description: | Site Trip Generation | Date: | 9-Nov-23 | | |
| Analysis Year: | | Checked By: | | | |
| Analysis Period: | AM Peak Hour | Date: | | | |

| Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate) | | | | | | |
|--|---|----------|-------|--------------------------------------|----------|---------|
| Land Use | Development Data (For Information Only) | | | Estimated Vehicle-Trips ³ | | |
| | ITE LUCs ¹ | Quantity | Units | Total | Entering | Exiting |
| Office | | | | 0 | | |
| Retail | 822 | 13 | ksf | 29 | 17 | 12 |
| Restaurant | 930 | 7 | ksf | 9 | 5 | 4 |
| Cinema/Entertainment | | | | 0 | | |
| Residential | | | | 0 | | |
| Hotel | | | | 0 | | |
| All Other Land Uses ² | 130 | 1,466 | ksf | 474 | 384 | 90 |
| | | | | 512 | 406 | 106 |

| Table 2-A: Mode Split and Vehicle Occupancy Estimates | | | | | | |
|---|------------------------|-----------|-----------------|------------------------|-----------|-----------------|
| Land Use | Entering Trips | | | Exiting Trips | | |
| | Veh. Occ. ⁴ | % Transit | % Non-Motorized | Veh. Occ. ⁴ | % Transit | % Non-Motorized |
| Office | | | 5% | | | 5% |
| Retail | | | 5% | | | 5% |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | | | | | | |
| Hotel | | | | | | |
| All Other Land Uses ² | | | 5% | | | 5% |

| Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance) | | | | | | |
|---|------------------|--------|------------|----------------------|-------------|-------|
| Origin (From) | Destination (To) | | | | | |
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | | | | | |
| Retail | | | | | | |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | | | | | | |
| Hotel | | | | | | |

| Table 4-A: Internal Person-Trip Origin-Destination Matrix* | | | | | | |
|--|------------------|--------|------------|----------------------|-------------|-------|
| Origin (From) | Destination (To) | | | | | |
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 0 | 0 | 0 | 0 | 0 |
| Retail | 0 | | 2 | 0 | 0 | 0 |
| Restaurant | 0 | 1 | | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | | 0 | 0 |
| Residential | 0 | 0 | 0 | 0 | | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | |

| Table 5-A: Computations Summary | | | |
|---|-------|----------|---------|
| | Total | Entering | Exiting |
| All Person-Trips | 512 | 406 | 106 |
| Internal Capture Percentage | 1% | 1% | 3% |
| External Vehicle-Trips ⁵ | 480 | 383 | 97 |
| External Transit-Trips ⁶ | 0 | 0 | 0 |
| External Non-Motorized Trips ⁶ | 26 | 20 | 6 |

| Table 6-A: Internal Trip Capture Percentages by Land Use | | |
|--|----------------|---------------|
| Land Use | Entering Trips | Exiting Trips |
| Office | N/A | N/A |
| Retail | 6% | 17% |
| Restaurant | 40% | 25% |
| Cinema/Entertainment | N/A | N/A |
| Residential | N/A | N/A |
| Hotel | N/A | N/A |

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

⁶Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

| NCHRP 684 Internal Trip Capture Estimation Tool | | | | | |
|---|------------------------------------|----------------------|--------------------------------------|--|--|
| Project Name: | Gun Club Business Park Development | Organization: | Fox Tuttle Transportation Group, LLC | | |
| Project Location: | Aurora, CO | Performed By: | C. Slade | | |
| Scenario Description: | Site Trip Generation | Date: | 9-Nov-23 | | |
| Analysis Year: | | Checked By: | | | |
| Analysis Period: | PM Peak Hour | Date: | | | |

| Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate) | | | | | | |
|--|---|----------|-------|--------------------------------------|----------|---------|
| Land Use | Development Data (For Information Only) | | | Estimated Vehicle-Trips ³ | | |
| | ITE LUCs ¹ | Quantity | Units | Total | Entering | Exiting |
| Office | | | | 0 | | |
| Retail | 822 | 13 | ksf | 81 | 41 | 40 |
| Restaurant | 930 | 7 | ksf | 77 | 42 | 35 |
| Cinema/Entertainment | | | | 0 | | |
| Residential | | | | 0 | | |
| Hotel | | | | 0 | | |
| All Other Land Uses ² | 130 | 1,466 | ksf | 474 | 104 | 370 |
| | | | | 632 | 187 | 445 |

| Table 2-P: Mode Split and Vehicle Occupancy Estimates | | | | | | |
|---|------------------------|-----------|-----------------|------------------------|-----------|-----------------|
| Land Use | Entering Trips | | | Exiting Trips | | |
| | Veh. Occ. ⁴ | % Transit | % Non-Motorized | Veh. Occ. ⁴ | % Transit | % Non-Motorized |
| Office | | | 5% | | | 5% |
| Retail | | | 5% | | | 5% |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | | | | | | |
| Hotel | | | | | | |
| All Other Land Uses ² | | | 5% | | | 5% |

| Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance) | | | | | | |
|---|------------------|--------|------------|----------------------|-------------|-------|
| Origin (From) | Destination (To) | | | | | |
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | | | | | |
| Retail | | | | | | |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | | | | | | |
| Hotel | | | | | | |

| Table 4-P: Internal Person-Trip Origin-Destination Matrix* | | | | | | |
|--|------------------|--------|------------|----------------------|-------------|-------|
| Origin (From) | Destination (To) | | | | | |
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 0 | 0 | 0 | 0 | 0 |
| Retail | 0 | | 12 | 0 | 0 | 0 |
| Restaurant | 0 | 14 | | 0 | 0 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | | 0 | 0 |
| Residential | 0 | 0 | 0 | 0 | | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | |

| Table 5-P: Computations Summary | | | |
|---|-------|----------|---------|
| | Total | Entering | Exiting |
| All Person-Trips | 632 | 187 | 445 |
| Internal Capture Percentage | 8% | 14% | 6% |
| External Vehicle-Trips ⁵ | 554 | 155 | 399 |
| External Transit-Trips ⁶ | 0 | 0 | 0 |
| External Non-Motorized Trips ⁶ | 26 | 6 | 20 |

| Table 6-P: Internal Trip Capture Percentages by Land Use | | |
|--|----------------|---------------|
| Land Use | Entering Trips | Exiting Trips |
| Office | N/A | N/A |
| Retail | 34% | 30% |
| Restaurant | 29% | 40% |
| Cinema/Entertainment | N/A | N/A |
| Residential | N/A | N/A |
| Hotel | N/A | N/A |

| |
|--|
| ¹ Land Use Codes (LUCs) from <i>Trip Generation Manual</i> , published by the Institute of Transportation Engineers. |
| ² Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator. |
| ³ Enter trips assuming no transit or non-motorized trips (as assumed in ITE <i>Trip Generation Manual</i>). |
| ⁴ Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be |
| ⁵ Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P. |
| ⁶ Person-Trips |
| *Indicates computation that has been rounded to the nearest whole number. |
| Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1 |

[illegible]

Source: ITE *Trip Generation Manual*, 11th Edition

[illegible]

[illegible]

Source: ITE *Trip Generation Manual*, 11th Edition

[illegible]

Sensitivity Analysis

**Table A1 - Peak Hour Intersection Level of Service and 95th Percentile Queue Summary -
Sensitivity Analysis**





















| Intersection and Lanes Groups | 2027 Bkgrd + Project [Sensitivity] | | | | | | 2050 Bkgrd + Project [Sensitivity] | | | | | |
|--|------------------------------------|----------|--------|-----------|----------|--------|------------------------------------|----------|--------|-----------|----------|--------|
| | AM Peak | | | PM Peak | | | AM Peak | | | PM Peak | | |
| | Delay | LOS | 95th Q | Delay | LOS | 95th Q | Delay | LOS | 95th Q | Delay | LOS | 95th Q |
| STOP SIGN CONTROL | | | | | | | | | | | | |
| 101. Gun Club Rd at Aspen Business Park Access (3/4 Mvmt) | 1 | A | | 0 | A | | 0 | A | | 0 | A | |
| Eastbound Right | 13 | B | 3' | 16 | C | 10' | 12 | B | 3' | 16 | C | 10' |
| Northbound Left | 13 | B | 13' | 13 | B | 3' | 11 | B | 10' | 13 | B | 3' |
| Northbound Through | 0 | A | 0' | 0 | A | 0' | 0 | A | 0' | 0 | A | 0' |
| Southbound Through | 0 | A | 0' | 0 | A | 0' | 0 | A | 0' | 0 | A | 0' |
| Southbound Right | 0 | A | 0' | 0 | A | 0' | 0 | A | 0' | 0 | A | 0' |
| 104. Gun Club Rd at North Access [3/4 Mvmt] | 0 | A | | 0 | A | | 0 | A | | 0 | A | |
| Eastbound Right | 15 | C | 3' | 13 | B | 5' | 25 | D | 3' | 36 | E | 20' |
| Northbound Left | 14 | B | 5' | 10 | A | 3' | 56 | F | 23' | 71 | F | 20' |
| Northbound Through | 0 | A | 0' | 0 | A | 0' | 0 | A | 0' | 0 | A | 0' |
| Southbound Through | 0 | A | 0' | 0 | A | 0' | 0 | A | 0' | 0 | A | 0' |
| Southbound Right | 0 | A | 0' | 0 | A | 0' | 0 | A | 0' | 0 | A | 0' |
| SIGNAL CONTROL | | | | | | | | | | | | |
| 103. Gun Club Rd at Addison Avenue | 14 | B | | 18 | B | | 15 | B | | 24 | C | |
| Eastbound Left | 38 | D | 83' | 50 | D | 275' | 49 | D | 103' | 52 | D | 361' |
| Eastbound Through+Right | 41 | D | 24' | 36 | D | 42' | 52 | D | 28' | 46 | D | 48' |
| Westbound Left | 36 | D | 11' | 34 | C | 30' | 47 | D | 42' | 49 | D | 103' |
| Westbound Through+Right | 41 | D | 21' | 39 | D | 27' | 50 | D | 6' | 52 | D | 13' |
| Northbound Left | 11 | B | 31' | 16 | B | 11' | 12 | B | 46' | 23 | C | 24' |
| Northbound Through | 12 | B | 287' | 5 | A | 244' | 15 | B | 569' | 15 | B | 589' |
| Northbound Right | 8 | A | 0' | 0 | A | 0' | 8 | A | 0' | 9 | A | 0' |
| Southbound Left | 9 | A | 12' | 10 | B | 19' | 20 | C | 65' | 31 | C | 116' |
| Southbound Through | 15 | B | 362' | 23 | C | 530' | 13 | B | 380' | 25 | C | 624' |
| Southbound Right | 10 | B | 35' | 12 | B | 0' | 9 | A | 40' | 13 | B | 0' |

Note: Delay represented in average seconds per vehicle.

| Intersection | | | | | | |
|--------------------------|--------|--------|-------|--------|------|------|
| Int Delay, s/veh | 0.5 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | ↗ | ↘ | ↗↘ | ↗↘ | ↗ |
| Traffic Vol, veh/h | 0 | 10 | 69 | 1118 | 1087 | 100 |
| Future Vol, veh/h | 0 | 10 | 69 | 1118 | 1087 | 100 |
| 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 | 200 | - | - | 200 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 95 | 95 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 11 | 75 | 1177 | 1144 | 109 |
| Major/Minor | Minor2 | Major1 | | Major2 | | |
| Conflicting Flow All | - | 572 | 1253 | 0 | - | 0 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | 6.94 | 4.14 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | 3.32 | 2.22 | - | - | - |
| Pot Cap-1 Maneuver | 0 | 463 | 551 | - | - | - |
| Stage 1 | 0 | - | - | - | - | - |
| Stage 2 | 0 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | - | 463 | 551 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Approach | EB | NB | | SB | | |
| HCM Control Delay, s | 13 | 0.8 | | 0 | | |
| HCM LOS | B | | | | | |
| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR | |
| Capacity (veh/h) | 551 | - | 463 | - | - | |
| HCM Lane V/C Ratio | 0.136 | - | 0.023 | - | - | |
| HCM Control Delay (s) | 12.6 | - | 13 | - | - | |
| HCM Lane LOS | B | - | B | - | - | |
| HCM 95th %tile Q(veh) | 0.5 | - | 0.1 | - | - | |

Timings
11/22/2023

103: Gun Club Road & Addison Avenue
2027 Bkgrd + Proj (PCE Sensitivity Analysis) - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 81 | 1 | 5 | 1 | 77 | 1026 | 15 | 20 | 1161 | 202 |
| Future Volume (vph) | 81 | 1 | 5 | 1 | 77 | 1026 | 15 | 20 | 1161 | 202 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 38.0 | 11.0 | 38.0 | 11.0 | 28.0 | 28.0 | 11.0 | 28.0 | 28.0 |
| Total Split (s) | 11.0 | 38.0 | 11.0 | 38.0 | 11.0 | 30.0 | 30.0 | 11.0 | 30.0 | 30.0 |
| Total Split (%) | 12.2% | 42.2% | 12.2% | 42.2% | 12.2% | 33.3% | 33.3% | 12.2% | 33.3% | 33.3% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 90











Actuated Cycle Length: 90











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

Natural Cycle: 100

Control Type: Actuated-Coordinated

Splits and Phases: 103: Gun Club Road & Addison Avenue























| | | | | |
|---|---|---|---|---|
|  |  |  |  |  |
| Ø1 | Ø2 (R) | | Ø3 | Ø4 |
| 11 s | 30 s | | 11 s | 38 s |
|  |  |  |  |  |
| Ø5 | Ø6 (R) | | Ø7 | Ø8 |
| 11 s | 30 s | | 11 s | 38 s |

| |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 88 | 24 | 5 | 17 | 84 | 1115 | 16 | 22 | 1262 | 220 |
| v/c Ratio | 0.59 | 0.14 | 0.03 | 0.11 | 0.27 | 0.43 | 0.01 | 0.06 | 0.53 | 0.19 |
| Control Delay | 51.0 | 17.0 | 30.4 | 20.2 | 6.6 | 9.2 | 0.0 | 5.3 | 12.7 | 2.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 51.0 | 17.0 | 30.4 | 20.2 | 6.6 | 9.2 | 0.0 | 5.3 | 12.7 | 2.3 |
| Queue Length 50th (ft) | 51 | 1 | 3 | 1 | 7 | 68 | 0 | 2 | 171 | 0 |
| Queue Length 95th (ft) | 83 | 24 | 11 | 21 | 31 | 287 | 0 | 12 | 362 | 35 |
| Internal Link Dist (ft) | | 564 | | 952 | | 985 | | | 915 | |
| Turn Bay Length (ft) | 300 | | 350 | | 350 | | 350 | 350 | | 350 |
| Base Capacity (vph) | 150 | 581 | 158 | 579 | 312 | 2582 | 1204 | 374 | 2364 | 1130 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.59 | 0.04 | 0.03 | 0.03 | 0.27 | 0.43 | 0.01 | 0.06 | 0.53 | 0.19 |
| Intersection Summary | | | | | | | | | | |

HCM 6th Signalized Intersection Summary

11/22/2023

103: Gun Club Road & Addison Avenue
2027 Bkgrd + Proj (PCE Sensitivity Analysis) - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  | |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 81 | 1 | 21 | 5 | 1 | 15 | 77 | 1026 | 15 | 20 | 1161 | 202 |
| Future Volume (veh/h) | 81 | 1 | 21 | 5 | 1 | 15 | 77 | 1026 | 15 | 20 | 1161 | 202 |
| 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 | 88 | 1 | 23 | 5 | 1 | 16 | 84 | 1115 | 16 | 22 | 1262 | 220 |
| 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 | 250 | 4 | 98 | 242 | 6 | 91 | 285 | 2109 | 941 | 325 | 2019 | 901 |
| Arrive On Green | 0.06 | 0.06 | 0.06 | 0.05 | 0.06 | 0.06 | 0.05 | 0.59 | 0.59 | 0.02 | 0.57 | 0.57 |
| Sat Flow, veh/h | 1781 | 66 | 1529 | 1781 | 94 | 1505 | 1781 | 3554 | 1585 | 1781 | 3554 | 1585 |
| Grp Volume(v), veh/h | 88 | 0 | 24 | 5 | 0 | 17 | 84 | 1115 | 16 | 22 | 1262 | 220 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1595 | 1781 | 0 | 1599 | 1781 | 1777 | 1585 | 1781 | 1777 | 1585 |
| Q Serve(g_s), s | 4.1 | 0.0 | 1.3 | 0.2 | 0.0 | 0.9 | 1.7 | 16.7 | 0.4 | 0.5 | 21.4 | 6.3 |
| Cycle Q Clear(g_c), s | 4.1 | 0.0 | 1.3 | 0.2 | 0.0 | 0.9 | 1.7 | 16.7 | 0.4 | 0.5 | 21.4 | 6.3 |
| Prop In Lane | 1.00 | | 0.96 | 1.00 | | 0.94 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 250 | 0 | 103 | 242 | 0 | 97 | 285 | 2109 | 941 | 325 | 2019 | 901 |
| V/C Ratio(X) | 0.35 | 0.00 | 0.23 | 0.02 | 0.00 | 0.17 | 0.30 | 0.53 | 0.02 | 0.07 | 0.62 | 0.24 |
| Avail Cap(c_a), veh/h | 250 | 0 | 567 | 248 | 0 | 569 | 297 | 2109 | 941 | 382 | 2019 | 901 |
| 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 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.0 | 0.0 | 40.0 | 35.5 | 0.0 | 40.1 | 10.3 | 10.8 | 7.5 | 8.8 | 13.0 | 9.7 |
| Incr Delay (d2), s/veh | 0.8 | 0.0 | 1.2 | 0.0 | 0.0 | 0.8 | 0.6 | 1.0 | 0.0 | 0.1 | 1.5 | 0.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.8 | 0.0 | 0.5 | 0.1 | 0.0 | 0.4 | 0.5 | 5.3 | 0.1 | 0.1 | 7.0 | 2.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 37.8 | 0.0 | 41.2 | 35.6 | 0.0 | 41.0 | 10.8 | 11.8 | 7.5 | 8.9 | 14.5 | 10.4 |
| LnGrp LOS | D | A | D | D | A | D | B | B | A | A | B | B |
| Approach Vol, veh/h | | 112 | | | 22 | | | 1215 | | | 1504 | |
| Approach Delay, s/veh | | 38.5 | | | 39.7 | | | 11.7 | | | 13.8 | |
| Approach LOS | | D | | | D | | | B | | | B | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 8.1 | 59.4 | 10.7 | 11.8 | 10.4 | 57.1 | 11.0 | 11.5 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 5.0 | 24.0 | 5.0 | 32.0 | 5.0 | 24.0 | 5.0 | 32.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.5 | 18.7 | 2.2 | 3.3 | 3.7 | 23.4 | 6.1 | 2.9 | | | | |
| Green Ext Time (p_c), s | 0.0 | 3.0 | 0.0 | 0.1 | 0.0 | 0.5 | 0.0 | 0.0 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 14.1 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

Intersection

Int Delay, s/veh 0.2

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations | | ↗ | ↘ | ↑↑ | ↑↑ | ↗ |
| Traffic Vol, veh/h | 0 | 6 | 21 | 1101 | 1377 | 91 |
| Future Vol, veh/h | 0 | 6 | 21 | 1101 | 1377 | 91 |
| 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 | 300 | - | - | 300 |
| 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 | 0 | 7 | 23 | 1197 | 1497 | 99 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - | 749 | 1596 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | - | 6.94 | 4.14 |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | - | 3.32 | 2.22 |
| Pot Cap-1 Maneuver | 0 | 354 | 407 |
| Stage 1 | 0 | - | - |
| Stage 2 | 0 | - | - |
| Platoon blocked, % | | | |
| Mov Cap-1 Maneuver | - | 354 | 407 |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |

| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 15.4 | 0.3 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT EBLn1 | SBT | SBR |
|-----------------------|-------|-----------|-------|-----|
| Capacity (veh/h) | 407 | - | 354 | - |
| HCM Lane V/C Ratio | 0.056 | - | 0.018 | - |
| HCM Control Delay (s) | 14.4 | - | 15.4 | - |
| HCM Lane LOS | B | - | C | - |
| HCM 95th %tile Q(veh) | 0.2 | - | 0.1 | - |

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0.3 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | ↗ | ↘ | ↗↘ | ↗↘ | ↗ |
| Traffic Vol, veh/h | 0 | 37 | 10 | 1454 | 1400 | 15 |
| Future Vol, veh/h | 0 | 37 | 10 | 1454 | 1400 | 15 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | 200 | - | - | 200 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 95 | 95 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 40 | 11 | 1531 | 1474 | 16 |





















| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - | 737 | 1490 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | - | 6.94 | 4.14 |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | - | 3.32 | 2.22 |
| Pot Cap-1 Maneuver | 0 | 361 | 447 |
| Stage 1 | 0 | - | - |
| Stage 2 | 0 | - | - |
| Platoon blocked, % | - | - | - |
| Mov Cap-1 Maneuver | - | 361 | 447 |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |

| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 16.2 | 0.1 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h) | 447 | - | 361 | - | - |
| HCM Lane V/C Ratio | 0.024 | - | 0.111 | - | - |
| HCM Control Delay (s) | 13.3 | - | 16.2 | - | - |
| HCM Lane LOS | B | - | C | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | 0.4 | - | - |

Timings
11/22/2023

103: Gun Club Road & Addison Avenue
2027 Bkgrd + Proj (PCE Sensitivity Analysis) - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 288 | 3 | 23 | 3 | 38 | 1403 | 13 | 33 | 1316 | 71 |
| Future Volume (vph) | 288 | 3 | 23 | 3 | 38 | 1403 | 13 | 33 | 1316 | 71 |
| Turn Type | pm+pt | NA | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 33.0 | 11.0 | 33.0 | 11.0 | 28.0 | 28.0 | 11.0 | 28.0 | 28.0 |
| Total Split (s) | 16.0 | 33.0 | 11.0 | 28.0 | 11.0 | 35.0 | 35.0 | 11.0 | 35.0 | 35.0 |
| Total Split (%) | 17.8% | 36.7% | 12.2% | 31.1% | 12.2% | 38.9% | 38.9% | 12.2% | 38.9% | 38.9% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 90









Actuated Cycle Length: 90

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

Natural Cycle: 105

Control Type: Actuated-Coordinated

Splits and Phases: 103: Gun Club Road & Addison Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 11 s | 35 s | 11 s | 33 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 11 s | 35 s | 16 s | 28 s |



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|------|------|------|------|-------|------|------|------|------|
| Lane Group Flow (vph) | 313 | 86 | 25 | 28 | 41 | 1525 | 14 | 36 | 1430 | 77 |
| v/c Ratio | 1.29 | 0.32 | 0.15 | 0.17 | 0.18 | 0.71 | 0.01 | 0.17 | 0.66 | 0.07 |
| Control Delay | 189.2 | 12.3 | 31.1 | 19.5 | 6.2 | 11.8 | 0.0 | 8.3 | 17.0 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 189.2 | 12.3 | 31.1 | 19.5 | 6.2 | 11.8 | 0.0 | 8.3 | 17.0 | 0.1 |
| Queue Length 50th (ft) | ~257 | 2 | 14 | 2 | 3 | 143 | 0 | 4 | 245 | 0 |
| Queue Length 95th (ft) | #275 | 42 | 30 | 27 | m11 | m#244 | m0 | 19 | #530 | 0 |
| Internal Link Dist (ft) | | 564 | | 952 | | 985 | | | 915 | |
| Turn Bay Length (ft) | 300 | | 350 | | 350 | | 350 | 350 | | 350 |
| Base Capacity (vph) | 243 | 536 | 164 | 413 | 228 | 2156 | 1035 | 211 | 2153 | 1034 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.29 | 0.16 | 0.15 | 0.07 | 0.18 | 0.71 | 0.01 | 0.17 | 0.66 | 0.07 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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























Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary

11/22/2023

103: Gun Club Road & Addison Avenue
2027 Bkgrd + Proj (PCE Sensitivity Analysis) - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  | |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 288 | 3 | 76 | 23 | 3 | 23 | 38 | 1403 | 13 | 33 | 1316 | 71 |
| Future Volume (veh/h) | 288 | 3 | 76 | 23 | 3 | 23 | 38 | 1403 | 13 | 33 | 1316 | 71 |
| 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 | 313 | 3 | 83 | 25 | 3 | 25 | 41 | 1525 | 14 | 36 | 1430 | 77 |
| 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 | 375 | 8 | 218 | 292 | 15 | 124 | 205 | 1788 | 797 | 307 | 1778 | 793 |
| Arrive On Green | 0.11 | 0.14 | 0.14 | 0.06 | 0.09 | 0.09 | 0.07 | 1.00 | 1.00 | 0.03 | 0.50 | 0.50 |
| Sat Flow, veh/h | 1781 | 56 | 1538 | 1781 | 173 | 1439 | 1781 | 3554 | 1585 | 1781 | 3554 | 1585 |
| Grp Volume(v), veh/h | 313 | 0 | 86 | 25 | 0 | 28 | 41 | 1525 | 14 | 36 | 1430 | 77 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1594 | 1781 | 0 | 1611 | 1781 | 1777 | 1585 | 1781 | 1777 | 1585 |
| Q Serve(g_s), s | 10.0 | 0.0 | 4.4 | 1.1 | 0.0 | 1.5 | 1.0 | 0.0 | 0.0 | 0.9 | 30.3 | 2.3 |
| Cycle Q Clear(g_c), s | 10.0 | 0.0 | 4.4 | 1.1 | 0.0 | 1.5 | 1.0 | 0.0 | 0.0 | 0.9 | 30.3 | 2.3 |
| Prop In Lane | 1.00 | | 0.97 | 1.00 | | 0.89 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 375 | 0 | 226 | 292 | 0 | 139 | 205 | 1788 | 797 | 307 | 1778 | 793 |
| V/C Ratio(X) | 0.84 | 0.00 | 0.38 | 0.09 | 0.00 | 0.20 | 0.20 | 0.85 | 0.02 | 0.12 | 0.80 | 0.10 |
| Avail Cap(c_a), veh/h | 375 | 0 | 478 | 292 | 0 | 394 | 240 | 1788 | 797 | 348 | 1778 | 793 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.3 | 0.0 | 35.0 | 33.6 | 0.0 | 38.2 | 15.0 | 0.0 | 0.0 | 10.0 | 18.8 | 11.8 |
| Incr Delay (d2), s/veh | 15.0 | 0.0 | 1.1 | 0.1 | 0.0 | 0.7 | 0.5 | 5.4 | 0.0 | 0.2 | 4.0 | 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(50%),veh/ln | 3.4 | 0.0 | 1.8 | 0.5 | 0.0 | 0.6 | 0.3 | 1.3 | 0.0 | 0.3 | 11.2 | 0.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 50.4 | 0.0 | 36.1 | 33.7 | 0.0 | 39.0 | 15.5 | 5.4 | 0.0 | 10.2 | 22.8 | 12.0 |
| LnGrp LOS | D | A | D | C | A | D | B | A | A | B | C | B |
| Approach Vol, veh/h | | 399 | | | 53 | | | 1580 | | | 1543 | |
| Approach Delay, s/veh | | 47.3 | | | 36.5 | | | 5.6 | | | 21.9 | |
| Approach LOS | | D | | | D | | | A | | | C | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 9.0 | 51.3 | 11.0 | 18.8 | 9.2 | 51.0 | 16.0 | 13.8 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 5.0 | 29.0 | 5.0 | 27.0 | 5.0 | 29.0 | 10.0 | 22.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.9 | 2.0 | 3.1 | 6.4 | 3.0 | 32.3 | 12.0 | 3.5 | | | | |
| Green Ext Time (p_c), s | 0.0 | 12.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.1 | | | | |

Intersection Summary

HCM 6th Ctrl Delay 17.8

HCM 6th LOS B

Notes

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

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0.2 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | ↗ | ↘ | ↗↘ | ↗↘ | ↗ |
| Traffic Vol, veh/h | 0 | 30 | 14 | 1700 | 1390 | 54 |
| Future Vol, veh/h | 0 | 30 | 14 | 1700 | 1390 | 54 |
| 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 | 300 | - | - | 300 |
| 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 | 0 | 33 | 15 | 1848 | 1511 | 59 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - | 756 | 1570 |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |
| Critical Hdwy | - | 6.94 | 4.14 |
| Critical Hdwy Stg 1 | - | - | - |
| Critical Hdwy Stg 2 | - | - | - |
| Follow-up Hdwy | - | 3.32 | 2.22 |
| Pot Cap-1 Maneuver | 0 | *502 | *751 |
| Stage 1 | 0 | - | - |
| Stage 2 | 0 | - | - |
| Platoon blocked, % | | 1 | 1 |
| Mov Cap-1 Maneuver | - | *502 | *751 |
| Mov Cap-2 Maneuver | - | - | - |
| Stage 1 | - | - | - |
| Stage 2 | - | - | - |

| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 12.7 | 0.1 | 0 |
| HCM LOS | B | | |























| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h) | * 751 | - | 502 | - | - |
| HCM Lane V/C Ratio | 0.02 | - | 0.065 | - | - |
| HCM Control Delay (s) | 9.9 | - | 12.7 | - | - |
| HCM Lane LOS | A | - | B | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | 0.2 | - | - |

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

| Intersection | | | | | | |
|----------------------------|--------|------------------------|-------|----------------------------|------|--------------------------------|
| Int Delay, s/veh | 0.2 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | ↗ | ↘ | ↑↑↑ | ↑↑↑ | ↗ |
| Traffic Vol, veh/h | 0 | 10 | 69 | 2403 | 1782 | 100 |
| Future Vol, veh/h | 0 | 10 | 69 | 2403 | 1782 | 100 |
| 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 | 250 | - | - | 250 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 98 | 98 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 11 | 75 | 2452 | 1818 | 109 |
| | | | | | | |
| Major/Minor | Minor2 | Major1 | | Major2 | | |
| Conflicting Flow All | - | 909 | 1927 | 0 | - | 0 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | 7.14 | 5.34 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | 3.92 | 3.12 | - | - | - |
| Pot Cap-1 Maneuver | 0 | *511 | *643 | - | - | - |
| Stage 1 | 0 | - | - | - | - | - |
| Stage 2 | 0 | - | - | - | - | - |
| Platoon blocked, % | | 1 | 1 | - | - | - |
| Mov Cap-1 Maneuver | - | *511 | *643 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| | | | | | | |
| | | | | | | |
| Approach | EB | NB | | SB | | |
| HCM Control Delay, s | 12.2 | 0.3 | | 0 | | |
| HCM LOS | B | | | | | |
| | | | | | | |
| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR | |
| Capacity (veh/h) | * 643 | - | 511 | - | - | |
| HCM Lane V/C Ratio | 0.117 | - | 0.021 | - | - | |
| HCM Control Delay (s) | 11.3 | - | 12.2 | - | - | |
| HCM Lane LOS | B | - | B | - | - | |
| HCM 95th %tile Q(veh) | 0.4 | - | 0.1 | - | - | |
| Notes | | | | | | |
| ~: Volume exceeds capacity | | \$: Delay exceeds 300s | | +: Computation Not Defined | | *: All major volume in platoon |

Timings
11/22/2023

103: Gun Club Road & Addison Avenue
2050 Bkgrd + Project (PCEs Sensitivity Analysis) - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 81 | 1 | 25 | 1 | 50 | 77 | 2276 | 50 | 80 | 1836 | 202 |
| Future Volume (vph) | 81 | 1 | 25 | 1 | 50 | 77 | 2276 | 50 | 80 | 1836 | 202 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 8 | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 38.0 | 11.0 | 38.0 | 38.0 | 11.0 | 28.0 | 28.0 | 11.0 | 28.0 | 28.0 |
| Total Split (s) | 11.0 | 38.0 | 38.0 | 38.0 | 38.0 | 11.0 | 28.0 | 28.0 | 11.0 | 28.0 | 28.0 |
| Total Split (%) | 9.6% | 33.0% | 33.0% | 33.0% | 33.0% | 9.6% | 24.3% | 24.3% | 9.6% | 24.3% | 24.3% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 115









Actuated Cycle Length: 115












Offset: 19 (17%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 110

Control Type: Actuated-Coordinated

Splits and Phases: 103: Gun Club Road & Addison Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 11 s | 28 s | 38 s | 38 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 11 s | 28 s | 11 s | 38 s |

| |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 88 | 24 | 27 | 1 | 54 | 84 | 2322 | 54 | 87 | 1873 | 220 |
| v/c Ratio | 0.59 | 0.15 | 0.14 | 0.01 | 0.21 | 0.41 | 0.71 | 0.05 | 0.46 | 0.54 | 0.19 |
| Control Delay | 62.1 | 22.0 | 40.4 | 47.0 | 1.8 | 14.5 | 17.4 | 0.1 | 21.2 | 13.5 | 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 | 62.1 | 22.0 | 40.4 | 47.0 | 1.8 | 14.5 | 17.4 | 0.1 | 21.2 | 13.5 | 2.5 |
| Queue Length 50th (ft) | ~76 | 1 | 17 | 1 | 0 | 15 | 416 | 0 | 16 | 287 | 6 |
| Queue Length 95th (ft) | 103 | 28 | 42 | 6 | 0 | 46 | 569 | 0 | 65 | 380 | 40 |
| Internal Link Dist (ft) | | 564 | | 1036 | | | 985 | | | 915 | |
| Turn Bay Length (ft) | 300 | | | | | 300 | | 300 | 300 | | 300 |
| Base Capacity (vph) | 150 | 460 | 492 | 955 | 881 | 203 | 3263 | 1086 | 189 | 3449 | 1137 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.59 | 0.05 | 0.05 | 0.00 | 0.06 | 0.41 | 0.71 | 0.05 | 0.46 | 0.54 | 0.19 |

Intersection Summary
























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

HCM 6th Signalized Intersection Summary

11/22/2023

103: Gun Club Road & Addison Avenue

2050 Bkgrd + Project (PCEs Sensitivity Analysis) - AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 81 | 1 | 21 | 25 | 1 | 50 | 77 | 2276 | 50 | 80 | 1836 | 202 |
| Future Volume (veh/h) | 81 | 1 | 21 | 25 | 1 | 50 | 77 | 2276 | 50 | 80 | 1836 | 202 |
| 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 | 88 | 1 | 23 | 27 | 1 | 0 | 84 | 2322 | 54 | 87 | 1873 | 220 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.98 | 0.92 | 0.92 | 0.98 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 234 | 4 | 103 | 212 | 125 | | 220 | 3270 | 1015 | 186 | 3271 | 1016 |
| Arrive On Green | 0.04 | 0.07 | 0.07 | 0.04 | 0.07 | 0.00 | 0.04 | 0.64 | 0.64 | 0.04 | 0.64 | 0.64 |
| Sat Flow, veh/h | 1781 | 66 | 1529 | 1781 | 1870 | 1585 | 1781 | 5106 | 1585 | 1781 | 5106 | 1585 |
| Grp Volume(v), veh/h | 88 | 0 | 24 | 27 | 1 | 0 | 84 | 2322 | 54 | 87 | 1873 | 220 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1595 | 1781 | 1870 | 1585 | 1781 | 1702 | 1585 | 1781 | 1702 | 1585 |
| Q Serve(g_s), s | 5.0 | 0.0 | 1.6 | 1.6 | 0.1 | 0.0 | 1.8 | 34.5 | 1.5 | 1.9 | 23.9 | 6.7 |
| Cycle Q Clear(g_c), s | 5.0 | 0.0 | 1.6 | 1.6 | 0.1 | 0.0 | 1.8 | 34.5 | 1.5 | 1.9 | 23.9 | 6.7 |
| Prop In Lane | 1.00 | | 0.96 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 234 | 0 | 108 | 212 | 125 | | 220 | 3270 | 1015 | 186 | 3271 | 1016 |
| V/C Ratio(X) | 0.38 | 0.00 | 0.22 | 0.13 | 0.01 | | 0.38 | 0.71 | 0.05 | 0.47 | 0.57 | 0.22 |
| Avail Cap(c_a), veh/h | 234 | 0 | 444 | 632 | 520 | | 225 | 3270 | 1015 | 191 | 3271 | 1016 |
| 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 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 47.9 | 0.0 | 50.7 | 46.4 | 50.1 | 0.0 | 10.5 | 13.6 | 7.7 | 18.3 | 11.7 | 8.6 |
| Incr Delay (d2), s/veh | 1.0 | 0.0 | 1.0 | 0.3 | 0.0 | 0.0 | 1.1 | 1.3 | 0.1 | 1.8 | 0.7 | 0.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.4 | 0.0 | 0.7 | 0.7 | 0.0 | 0.0 | 0.6 | 11.0 | 0.5 | 1.3 | 7.6 | 2.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 48.9 | 0.0 | 51.8 | 46.6 | 50.1 | 0.0 | 11.6 | 15.0 | 7.8 | 20.2 | 12.5 | 9.1 |
| LnGrp LOS | D | A | D | D | D | | B | B | A | C | B | A |
| Approach Vol, veh/h | | 112 | | | 28 | | | 2460 | | | 2180 | |
| Approach Delay, s/veh | | 49.5 | | | 46.8 | | | 14.7 | | | 12.4 | |
| Approach LOS | | D | | | D | | | B | | | B | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 10.7 | 79.6 | 10.9 | 13.8 | 10.7 | 79.7 | 11.0 | 13.7 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 5.0 | 22.0 | 32.0 | 32.0 | 5.0 | 22.0 | 5.0 | 32.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 3.9 | 36.5 | 3.6 | 3.6 | 3.8 | 25.9 | 7.0 | 2.1 | | | | |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | | | | |

Intersection Summary

HCM 6th Ctrl Delay 14.7

HCM 6th LOS B

Notes

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

Intersection

Int Delay, s/veh 0.3

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations | | ↗ | ↘ | ↑↑↑ | ↑↑↑ | ↗ |
| Traffic Vol, veh/h | 0 | 6 | 21 | 2386 | 2112 | 91 |
| Future Vol, veh/h | 0 | 6 | 21 | 2386 | 2112 | 91 |
| 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 | 300 | - | - | 300 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 98 | 98 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 7 | 23 | 2435 | 2155 | 99 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - 1078 | 2254 | 0 - 0 |
| Stage 1 | - | - | - - - |
| Stage 2 | - | - | - - - |
| Critical Hdwy | - 7.14 | 5.34 | - - - |
| Critical Hdwy Stg 1 | - | - | - - - |
| Critical Hdwy Stg 2 | - | - | - - - |
| Follow-up Hdwy | - 3.92 | 3.12 | - - - |
| Pot Cap-1 Maneuver | 0 184 | 93 | - - - |
| Stage 1 | 0 | - | - - - |
| Stage 2 | 0 | - | - - - |
| Platoon blocked, % | | | - - - |
| Mov Cap-1 Maneuver | - 184 | 93 | - - - |
| Mov Cap-2 Maneuver | - | - | - - - |
| Stage 1 | - | - | - - - |
| Stage 2 | - | - | - - - |























| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 25.3 | 0.5 | 0 |
| HCM LOS | D | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h) | 93 | - | 184 | - | - |
| HCM Lane V/C Ratio | 0.245 | - | 0.035 | - | - |
| HCM Control Delay (s) | 55.9 | - | 25.3 | - | - |
| HCM Lane LOS | F | - | D | - | - |
| HCM 95th %tile Q(veh) | 0.9 | - | 0.1 | - | - |

| Intersection | | | | | | |
|----------------------------|--------|------------------------|-------|----------------------------|------|--------------------------------|
| Int Delay, s/veh | 0.2 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | ↗ | ↘ | ↑↑↑ | ↑↑↑ | ↗ |
| Traffic Vol, veh/h | 0 | 37 | 10 | 2064 | 2375 | 15 |
| Future Vol, veh/h | 0 | 37 | 10 | 2064 | 2375 | 15 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | 0 | 250 | - | - | 250 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 98 | 98 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 40 | 11 | 2106 | 2423 | 16 |
| | | | | | | |
| Major/Minor | Minor2 | Major1 | | Major2 | | |
| Conflicting Flow All | - | 1212 | 2439 | 0 | - | 0 |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| Critical Hdwy | - | 7.14 | 5.34 | - | - | - |
| Critical Hdwy Stg 1 | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - |
| Follow-up Hdwy | - | 3.92 | 3.12 | - | - | - |
| Pot Cap-1 Maneuver | 0 | *378 | *476 | - | - | - |
| Stage 1 | 0 | - | - | - | - | - |
| Stage 2 | 0 | - | - | - | - | - |
| Platoon blocked, % | | 1 | 1 | - | - | - |
| Mov Cap-1 Maneuver | - | *378 | *476 | - | - | - |
| Mov Cap-2 Maneuver | - | - | - | - | - | - |
| Stage 1 | - | - | - | - | - | - |
| Stage 2 | - | - | - | - | - | - |
| | | | | | | |
| | | | | | | |
| Approach | EB | NB | | SB | | |
| HCM Control Delay, s | 15.7 | 0.1 | | 0 | | |
| HCM LOS | C | | | | | |
| | | | | | | |
| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR | |
| Capacity (veh/h) | * 476 | - | 378 | - | - | |
| HCM Lane V/C Ratio | 0.023 | - | 0.106 | - | - | |
| HCM Control Delay (s) | 12.7 | - | 15.7 | - | - | |
| HCM Lane LOS | B | - | C | - | - | |
| HCM 95th %tile Q(veh) | 0.1 | - | 0.4 | - | - | |
| Notes | | | | | | |
| ~: Volume exceeds capacity | | \$: Delay exceeds 300s | | +: Computation Not Defined | | *: All major volume in platoon |

Timings
11/22/2023

103: Gun Club Road & Addison Avenue
2050 Bkgrd + Project (PCEs Sensitivity Analysis) - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|---|---|---|---|---|---|--|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph) | 288 | 3 | 88 | 3 | 103 | 38 | 1978 | 48 | 128 | 2226 | 71 |
| Future Volume (vph) | 288 | 3 | 88 | 3 | 103 | 38 | 1978 | 48 | 128 | 2226 | 71 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 8 | 2 | | 2 | 6 | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 38.0 | 11.0 | 38.0 | 38.0 | 11.0 | 28.0 | 28.0 | 11.0 | 28.0 | 28.0 |
| Total Split (s) | 25.0 | 39.0 | 14.0 | 28.0 | 28.0 | 11.0 | 55.0 | 55.0 | 12.0 | 56.0 | 56.0 |
| Total Split (%) | 20.8% | 32.5% | 11.7% | 23.3% | 23.3% | 9.2% | 45.8% | 45.8% | 10.0% | 46.7% | 46.7% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | Max | None | None | None | None | None | C-Max | C-Max | None | C-Max | C-Max |

Intersection Summary

Cycle Length: 120









Actuated Cycle Length: 120












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

Natural Cycle: 110

Control Type: Actuated-Coordinated

Splits and Phases: 103: Gun Club Road & Addison Avenue

| | | | |
|---|---|---|---|
|  |  |  |  |
| Ø1 | Ø2 (R) | Ø3 | Ø4 |
| 12 s | 55 s | 14 s | 39 s |
|  |  |  |  |
| Ø5 | Ø6 (R) | Ø7 | Ø8 |
| 11 s | 56 s | 25 s | 28 s |

| |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Group Flow (vph) | 313 | 86 | 96 | 3 | 112 | 41 | 2018 | 52 | 139 | 2271 | 77 |
| v/c Ratio | 0.83 | 0.24 | 0.48 | 0.02 | 0.40 | 0.26 | 0.85 | 0.06 | 0.56 | 0.83 | 0.08 |
| Control Delay | 57.8 | 11.9 | 43.5 | 53.0 | 4.1 | 21.5 | 50.3 | 0.6 | 28.2 | 27.1 | 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 | 57.8 | 11.9 | 43.5 | 53.0 | 4.1 | 21.5 | 50.3 | 0.6 | 28.2 | 27.1 | 0.2 |
| Queue Length 50th (ft) | 214 | 2 | 57 | 2 | 0 | 21 | 541 | 0 | 49 | 538 | 0 |
| Queue Length 95th (ft) | #361 | 48 | 103 | 13 | 0 | m24 | m589 | m0 | 116 | 624 | 0 |
| Internal Link Dist (ft) | | 564 | | 1036 | | | 985 | | | 915 | |
| Turn Bay Length (ft) | 300 | | | | | 300 | | 300 | 300 | | 300 |
| Base Capacity (vph) | 379 | 498 | 205 | 341 | 446 | 159 | 2388 | 844 | 249 | 2744 | 942 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.83 | 0.17 | 0.47 | 0.01 | 0.25 | 0.26 | 0.85 | 0.06 | 0.56 | 0.83 | 0.08 |

Intersection Summary

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

Queue shown is maximum after two cycles.
























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

HCM 6th Signalized Intersection Summary

11/22/2023

103: Gun Club Road & Addison Avenue

2050 Bkgrd + Project (PCEs Sensitivity Analysis) - PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h) | 288 | 3 | 76 | 88 | 3 | 103 | 38 | 1978 | 48 | 128 | 2226 | 71 |
| Future Volume (veh/h) | 288 | 3 | 76 | 88 | 3 | 103 | 38 | 1978 | 48 | 128 | 2226 | 71 |
| 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 | 313 | 3 | 83 | 96 | 3 | 0 | 41 | 2018 | 52 | 139 | 2271 | 77 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.98 | 0.92 | 0.92 | 0.98 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 434 | 9 | 244 | 265 | 124 | | 143 | 2681 | 832 | 204 | 2778 | 862 |
| Arrive On Green | 0.16 | 0.16 | 0.16 | 0.07 | 0.07 | 0.00 | 0.04 | 0.70 | 0.70 | 0.05 | 0.54 | 0.54 |
| Sat Flow, veh/h | 1781 | 56 | 1538 | 1781 | 1870 | 1585 | 1781 | 5106 | 1585 | 1781 | 5106 | 1585 |
| Grp Volume(v), veh/h | 313 | 0 | 86 | 96 | 3 | 0 | 41 | 2018 | 52 | 139 | 2271 | 77 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1594 | 1781 | 1870 | 1585 | 1781 | 1702 | 1585 | 1781 | 1702 | 1585 |
| Q Serve(g_s), s | 19.0 | 0.0 | 5.8 | 5.9 | 0.2 | 0.0 | 1.3 | 30.1 | 1.2 | 4.3 | 43.8 | 2.8 |
| Cycle Q Clear(g_c), s | 19.0 | 0.0 | 5.8 | 5.9 | 0.2 | 0.0 | 1.3 | 30.1 | 1.2 | 4.3 | 43.8 | 2.8 |
| Prop In Lane | 1.00 | | 0.97 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 434 | 0 | 253 | 265 | 124 | | 143 | 2681 | 832 | 204 | 2778 | 862 |
| V/C Ratio(X) | 0.72 | 0.00 | 0.34 | 0.36 | 0.02 | | 0.29 | 0.75 | 0.06 | 0.68 | 0.82 | 0.09 |
| Avail Cap(c_a), veh/h | 434 | 0 | 438 | 266 | 343 | | 162 | 2681 | 832 | 204 | 2778 | 862 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 41.9 | 0.0 | 44.9 | 47.7 | 52.4 | 0.0 | 21.7 | 13.1 | 8.8 | 21.8 | 22.5 | 13.1 |
| Incr Delay (d2), s/veh | 9.9 | 0.0 | 0.8 | 0.8 | 0.1 | 0.0 | 1.1 | 2.0 | 0.1 | 8.9 | 2.8 | 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(50%),veh/ln | 9.7 | 0.0 | 2.3 | 2.7 | 0.1 | 0.0 | 0.5 | 7.2 | 0.5 | 2.4 | 16.0 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 51.9 | 0.0 | 45.7 | 48.5 | 52.4 | 0.0 | 22.8 | 15.1 | 8.9 | 30.6 | 25.3 | 13.3 |
| LnGrp LOS | D | A | D | D | D | | C | B | A | C | C | B |
| Approach Vol, veh/h | | 399 | | | 99 | | | 2111 | | | 2487 | |
| Approach Delay, s/veh | | 50.5 | | | 48.7 | | | 15.1 | | | 25.2 | |
| Approach LOS | | D | | | D | | | B | | | C | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 12.0 | 69.0 | 13.9 | 25.1 | 9.7 | 71.3 | 25.0 | 14.0 | | | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | | | |
| Max Green Setting (Gmax), s | 6.0 | 49.0 | 8.0 | 33.0 | 5.0 | 50.0 | 19.0 | 22.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 6.3 | 32.1 | 7.9 | 7.8 | 3.3 | 45.8 | 21.0 | 2.2 | | | | |
| Green Ext Time (p_c), s | 0.0 | 11.9 | 0.0 | 0.4 | 0.0 | 3.8 | 0.0 | 0.0 | | | | |

Intersection Summary

HCM 6th Ctrl Delay 23.5

HCM 6th LOS C

Notes

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

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

| Intersection | | | | | | |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh | 0.4 | | | | | |
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | | ↗ | ↘ | ↑↑↑ | ↑↑↑ | ↗ |
| Traffic Vol, veh/h | 0 | 30 | 14 | 2355 | 2395 | 54 |
| Future Vol, veh/h | 0 | 30 | 14 | 2355 | 2395 | 54 |
| 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 | 300 | - | - | 300 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 98 | 98 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 0 | 33 | 15 | 2403 | 2444 | 59 |

| Major/Minor | Minor2 | Major1 | Major2 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | - 1222 | 2503 | 0 - 0 |
| Stage 1 | - | - | - - - |
| Stage 2 | - | - | - - - |
| Critical Hdwy | - 7.14 | 5.34 | - - - |
| Critical Hdwy Stg 1 | - | - | - - - |
| Critical Hdwy Stg 2 | - | - | - - - |
| Follow-up Hdwy | - 3.92 | 3.12 | - - - |
| Pot Cap-1 Maneuver | 0 147 | 69 | - - - |
| Stage 1 | 0 | - | - - - |
| Stage 2 | 0 | - | - - - |
| Platoon blocked, % | | | - - - |
| Mov Cap-1 Maneuver | - 147 | 69 | - - - |
| Mov Cap-2 Maneuver | - | - | - - - |
| Stage 1 | - | - | - - - |
| Stage 2 | - | - | - - - |

| Approach | EB | NB | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 36.3 | 0.4 | 0 |
| HCM LOS | E | | |

| Minor Lane/Major Mvmt | NBL | NBT EBLn1 | SBT | SBR |
|-----------------------|-------|-----------|-----|-----|
| Capacity (veh/h) | 69 | - 147 | - | - |
| HCM Lane V/C Ratio | 0.221 | - 0.222 | - | - |
| HCM Control Delay (s) | 71.4 | - 36.3 | - | - |
| HCM Lane LOS | F | - E | - | - |
| HCM 95th %tile Q(veh) | 0.8 | - 0.8 | - | - |